

2005

2005- 2008 UNLV McNair Journal

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BIOGRAPHY OF

DR. RONALD E. MCNAIR

HE OVERCAME OBSTACLES.

Dr. Ronald Erwin McNair, Physicist & Astronaut, dared to dream. As an African-American growing up in a poor community in the South, he encountered discrimination early in his youth. Yet this did not stop him from pursuing his dream of becoming a scientist.

HE ACHIEVED ACADEMIC EXCELLENCE.

In 1971, he graduated magna cum laude from North Carolina AT&T State University with a B.S. degree in physics. Ronald McNair then enrolled in the Massachusetts Institute of Technology. In 1976, at the age of 26, he earned his Ph.D. degree in laser physics.

HE BECAME A LEADER IN HIS FIELD.

Dr. 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 shuttle Challenger.

HE WAS RESPECTED AND COMMENDED.

For his achievements, Ronald McNair received three honorary doctorate degrees and many fellowships and commendations. These distinctions include: Presidential Scholar, 1967-71; Ford Foundation Fellow, 1971-74; National Fellowship Fund Fellow, 1974-75; Omega Psi Phi Scholar of the Year, 1975; Distinguished National Scientist, National Society of Black Professional Engineers, 1979; and the Friend of Freedom Award, 1981.



HE EXCELLED IN MANY ASPECTS OF LIFE.

Ronald McNair also held a fifth degree black belt in karate and was an accomplished jazz saxophonist. He was married and was the dedicated father of a daughter and a son.

After his death in the Challenger explosion in January 1986, members of Congress provided funding for the Ronald E. McNair Post-Baccalaureate Achievement Program to encourage college students with similar backgrounds to Dr. McNair to enroll in graduate studies. Thus, the program targets students of color and low-income, first-generation college students. This program is dedicated to the high standards of achievement inspired by Dr. McNair's life.

TABLE OF CONTENTS

Biography of Dr. Ronald E. McNair.....	1
Statements	
Dr. Neal J. Smatresk, UNLV President.....	4
Dr. Juanita P. Fain, Vice President of Student Affairs.....	5
Dr. William W. Sullivan, Associate Vice President for Retention and Outreach.....	6
Mr. Keith Rogers, Deputy Executive Director of the Center for Academic Enrichment and Outreach.....	7
McNair Scholars Institute Staff.....	8

2005 McNAIR SCHOLAR ARTICLES

The Lolita Syndrome: Exploring Potential Negative Impacts of the Sexualization of Pre-Teen Girls in the Media.....	10
VALERIE AVERY	
Nevada Foster Parent Satisfaction.....	13
SHANA BACHUS	
Investigating Addiction and Recovery.....	16
KARMEN K. BOEHLKE	
Microbial Community and Geochemical Analysis of Silver Lake Playa.....	19
ANDREA FLORES	
Racial Redistricting: Minority Political Representation in Nevada.....	24
ALDEN KELLY	
Social Exchange and Satisfaction in Romantic Relationships Among Latinos.....	27
ERICK LOPEZ	
The War Against Spam: An Overview of Different Spam Fighting Approaches.....	32
CAROL PREUSSLER	
The Use of Standardized Computer-Based Testing to Determine Academic Success.....	37
HEATHER SHAY	

2006 McNAIR SCHOLAR ARTICLES

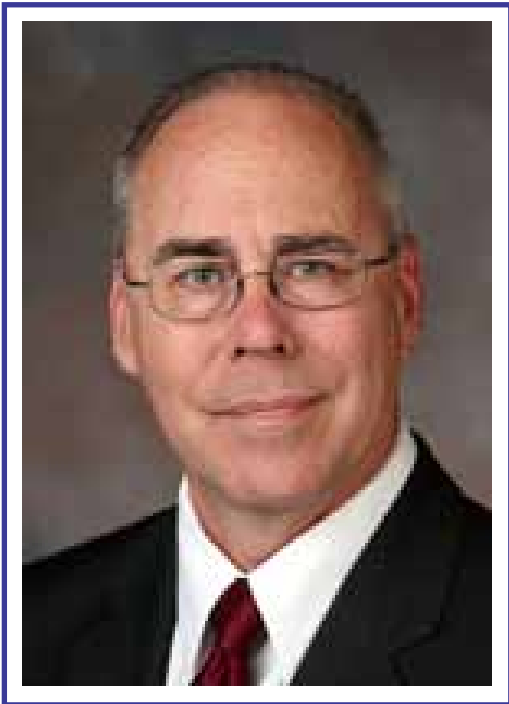
We Get By With A Little Help From our Friends: Exploring the Effects of Coworker Support on Employee Burnout and Job Attitudes.....	42
VALERIE AVERY	
The Fremens, The Oppressed of the Imperium.....	49
AVA BOOKATZ	
Reclaiming Paradise: the Quest For Eden in Environmental Literature.....	55
SHAUN ELSASSER	
A Case Study of a Dual Language Program in Southern Nevada.....	62
VERONICA HICKS	
Memory Processing and Positive Emotions.....	69
SHAIDA S. JETHA	
Assessment of Gene Expression During Life History Transitions in Daphnia Pulex.....	74
ANTHONY QUINN	
Gun Availability, Psychopathology and the Risk of Death From Suicide Attempt by Gun.....	79
THURITHABHANI SENEVIRATNE	
Characteristics of Low Back Pain Patients Seeking Help From Various Health Care Providers.....	83
TEDDY BOADO SIM JR	
Examining the Psychometric Properties of The Ethnic Considerations in Therapy Scale.....	90
LIZA WARD	

2007 McNAIR SCHOLAR ARTICLES

Ageism in the Entertainment Industry: Short and Long Term Effects on Performing Arts Education and Society	100
KATHLEEN BELL	
Social and Psychological Effects of Western Culture	107
CHERYL R. COLEMAN	
Denied Indicative Conditionals and Biconditionals	114
JESSE FITTS	
Cultural Competence: How It Applies to The World.....	119
AMRIS HENRY-RODGERS	
Examining Adolescent Inner Experience – A Case Study.....	124
JACQUELYNN KAAA-LOGAN	
The Effectiveness of Incentives in the Hospitality Industry.....	129
JASON OROZCO	
Assessing the Dry-Limits of Life in the Mars-Like Soils of the Atacama Desert	135
JUAN C. PLATA	
Creativity in Business: In Search of an Effective Model.....	140
BONNIE BARTLETT	

2008 McNAIR SCHOLAR ARTICLES

The Legend Of The Las Vegas Chiaroscuro.....	144
KATHLEEN BELL	
A Strange Attractor in Thomas Bernhard’s Heldenplatz.....	152
AVA BOOKATZ	
The Correlation Between Participants in Sports And Music and High Academic Performance	158
VACHERAL M. CARTER	
“Treasonous Acculturation:” The Legacy of La Malinche’s Betrayal and its Effect on Women of Mexican American Descent	162
NYDIA DIAZ	
Impact of The Kinship Liaison Program on Relative Caregivers	170
KIMBERLY HACKSTOCK	
Post-Traumatic Stress Disorder in Soldiers With Combat-Related Injuries	179
AMRIS HENRY-RODGERS	
Emotional Memory and Older Adults	184
SHAIDA S. JETHA	
Infants’ Categorization of Faces.....	190
JULIO A. LUNA	
The Effect of Patents on Innovation and Access to Pharmaceuticals	195
CHARLES MAO	
An Experimental Setup to Identify the Geometrical Correlation Between Upper Airway Opening and Hyoid Bone Displacement: Data for a Potential Obstructive Sleep Apnea Treatment.....	201
JUAN C. PLATA	
The Relationship Between Exotic Dancing and Childhood Sexual Abuse	206
SANDRA RAMOS	
Stop Snitchin’.....	212
PRECIOUS RIDEOUT	
A Comparison of Cognitive Deficits Between Bipolar Disorder and Bipolar Disorder Co-Occuring With Anxiety Disorders.....	218
BENJAMIN LEE WATROUS	
The Effect of Retro-Locomotion on Flexibility of the Low Back and Hamstrings	226
CHET R. WHITLEY	



UNLV PRESIDENT

DR. NEAL J. SMATRESK

I hope you will enjoy reading the fourth edition of the UNLV McNair Scholars Journal. This journal exemplifies the quality and rigor of scholarly research conducted by our undergraduate students in the McNair Scholars program and reflects the mentoring and commitment to student success provided by our outstanding and dedicated faculty. Each article represents countless hours of research, experimentation, and analysis; the authors are the intuitive and discerning students who we anticipate will be at the top of their respective fields in the future.

The UNLV McNair Scholars Institute provides a unique opportunity for several of the most talented undergraduate students at UNLV to work with some of our extraordinary faculty in order to learn about how to design, implement, and report research. During this process students are provided with a foundation for conducting research that will hopefully stimulate a desire for continuing their education with graduate studies and lead them on a path towards becoming a future professor. This student and faculty collaboration characterizes the interactive and rewarding learning experiences available to our students.

We are honored to have these talented students and dedicated faculty at our university and we are proud to share this publication as a testament to their outstanding work. The research reported in this journal exemplifies the scholarly studies conducted by our undergraduate students and reflects the quality of mentoring and commitment to student success provided by our outstanding and dedicated faculty.

A handwritten signature in black ink, appearing to read 'Neal J. Smatresk', with a stylized flourish extending to the right.

Neal J. Smatresk
President



VICE PRESIDENT OF STUDENT AFFAIRS

DR. JUANITA P. FAIN

The UNLV McNair Scholars Program personifies the mission of our Division of Student Affairs. Our mission is to provide quality services and programs that create educational opportunities, foster collegiate success, enhance continuous learning and promote a just and inclusive campus.

Within a broader context, UNLV seeks to create a campus environment that promotes the performance of superior research and scholarly endeavors at all levels of study. A unique framework to engage under-represented undergraduate and graduate students in exciting and enriching research opportunities is provided by the McNair Scholars Program. This fourth publication of UNLV's McNair Scholars Journal is an affirmation and amplification of those endeavors and accomplishments.

Perhaps the most important aspect of the McNair Scholars Program is that of relationship between the faculty mentor and scholar. For the scholar, the benefit of participating in the program depends to a large extent on this relationship. The relationship is designed to encourage, motivate and prepare McNair scholars for doctoral studies. Based on the research reported in this journal, the program has been a resounding success. It provides an undeniable testament to the hard work and commitment of the students and their faculty mentors.

I extend my sincere commendations and congratulations to the McNair scholars, faculty mentors, program staff, and the Center for Academic Enrichment and Outreach for a job well done. This edition of the UNLV McNair Scholars Journal is a fine tribute to their success.

ASSOCIATE VICE PRESIDENT FOR RETENTION AND OUTREACH AND EXECUTIVE DIRECTOR



DR. WILLIAM W. SULLIVAN

This fourth publication of UNLV's McNair Scholars Journal is the culmination of extremely hard work by many talented and dedicated individuals. The triumphs of the McNair Scholars and the commitment of their faculty mentors are highlighted within these pages and are exemplary examples of the academic excellence at UNLV.

Over 30 years ago I began my career in higher education, working with high school and college officials to attract young minority students towards postsecondary education; at the time, few universities employed faculty members who could personally identify with the economic and/or social backgrounds of disadvantaged students. There was an urgent need to diversify the ranks of college faculty in order to create academic environments where nontraditional and under-represented students could succeed.

To meet this need, the U.S. Department of Education established the Ronald E. McNair Post Baccalaureate Program. Named for one of the astronauts who perished in the 1986 Challenger explosion, the McNair Program sought to prepare a cadre of underrepresented college students to become university professors and role models for others from similar backgrounds. Since its inception, McNair has become the most prestigious federal education program, helping to diversify the faculties at universities and colleges across the country. It is an honor for the Center for Academic Enrichment and Outreach to host UNLV's McNair Program.

I commend the McNair scholars and their mentors for their hard work and dedication. These scholars displayed outstanding academic excellence in conducting their research; I have no doubt they will develop into topnotch educators. I also applaud President Neal Smatresk, Vice President Juanita Fain, Deputy Executive Director Keith Rogers, the Graduate College, and many other university units for their resolute support of the McNair Program. This journal, displaying the fruit of the McNair Scholars toil, reinforces our legacy and continues a tradition of excellence for future scholars.

DEPUTY EXECUTIVE DIRECTOR

MR. KEITH ROGERS



It gives me immense pride to recognize the inimitable research profiled in the fourth UNLV McNair Scholars Institute Journal. Each year scholars are challenged to participate in research that is relevant, engaging, unique and consistent with their interests while under the careful watch of a faculty mentor. The broad scope of research topics and quality of articles always exceed expectations; this year's journal publication is no exception.

UNLV operates one of 200 prestigious McNair programs designed to increase attainment of Ph.D. degrees by students from under-represented groups. Since receiving the Ronald E. McNair Post-Baccalaureate Achievement Program in 1999, UNLV has assisted over 250 talented undergraduate students who have demonstrated strong academic potential and has provided them an opportunity to conduct research and participate in other scholarly activities.

This publication reflects not only the dedication and hard work that resulted in the research journal presented here, but also the extraordinary support and expertise offered by the faculty mentors. I congratulate the McNair Scholars, applaud all participating faculty, and extend my sincere appreciation to the Graduate College and the UNLV's leadership for supporting and encouraging the outstanding accomplishments of our students.



MS. DEANNA R. DAVIS
DIRECTOR FOR ACADEMIC ENRICHMENT
CENTER FOR ACADEMIC ENRICHMENT
AND OUTREACH

DR. HARRIET E. BARLOW
ASSOCIATE DEAN FOR RETENTION AND
PROFESSIONAL DEVELOPMENT
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INSTITUTE COORDINATOR



MS. TERRI BERNSTEIN
RETENTION AND
ACADEMIC COORDINATOR

2005
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ARTICLES

THE LOLITA SYNDROME: EXPLORING POTENTIAL NEGATIVE IMPACTS OF THE SEXUALIZATION OF PRE-TEEN GIRLS IN THE MEDIA

BY VALERIE AVERY



INTRODUCTION

The following abstract is the result of research done on the subject of the commercial sexualization of girls, age eleven to thirteen, in the media. It is one piece of an on-going project conducted by Dr. Kate Hausbeck and Nicole Rodgers, in which I have participated for the past three months, and which is still in progress. My work on of the project has focused on the trend toward the heightened sexualization of girls in the media, and asks the question: What are the potentially negative impacts associated with these hyper-sexual media depictions of "tween" adolescent girls? The issues surrounding this question are complex and the possible implications varied, thus, this submission is an important addition to the body of research to further develop a complete understanding of all the ramifications.

LITERATURE REVIEW AND OBJECTIVES

In Vladimir Nabokov's controversial 1962 novel, *Lolita*, a middle-aged professor develops a sexual obsession with his twelve-year-old step daughter named Lolita. The tension in the novel is between young Lolita's occasionally provocative comments, behaviors and overtures as a sexual agent, and her step-father's counter-normative and illegal sexual involvement with the girl. In this project we invoke the name Lolita as a metaphor for the controversies and tension associated with adolescent girls as sexual beings and the risks of their victimization

when depicted as such or treated as such by the adult world around them.

The commercial sexualization of adolescent girls by the media has a range of impacts which are potentially both positive and negative. Other parts of this research will explore the ways in which 11-13 year old girls and boys interpret, adopt, resist, and reframe sexualized ads and media messages in ways that may not be negative, and may even be empowering. This study's objective in this project was to examine the research, literature, and available data that specifically addresses the potentially negative effects. After doing a comprehensive survey of the literature and reviewing the transcripts from Lolita Project focus groups with 11-13 year olds, three themes emerged which will be focused on in this paper. They are: first, the exploitation of an unwitting adolescent girl, second, the proliferation of an unhealthy "thin ideal" and third, the dangers of desensitizing of the public to these images and ideals.

METHODS

A thorough literature review was used to find data relevant to the three aforementioned negative aspects of media's sexualization of pre-teen girls. In addition this research also examined the negative aspects as expressed by 11-13 year olds during Lolita Project focus group interviews.

FOCUS GROUPS

Boys and girls, ages eleven to thirteen, were recruited for focus groups. After the parents and the participants had signed consent and assent forms, groups of four to six students were formed. The groups were either all boys or all girls, and were interviewed separately. In the interviews the participants were shown various ads from teen magazines, and asked to openly give their responses and opinions of them. The students were assured that their responses would not be seen by their parents or anyone they knew; this allowed for very candid responses. These interviews were video and tape recorded, and then transcribed for textual review and analysis.

LITERATURE RESEARCH

Over 250 articles, reports, case studies, and longitudinal studies, by noted leaders in their fields, were reviewed in order to gather relative data. Every article was read, and a brief summary and bibliographic entry was completed for each. These reviews served as compressed references, which enabled quick access for locating data, tables, charts and statistics as needed.

FINDINGS

NEGATIVE ASPECTS

The exploitation of women has long been a common theme in the media: it is commonly visible in advertising, television, movies, and magazines. There is currently research which points to a growing trend of exploiting young and unwitting girls. In ad after ad, young girls are featured in sexy clothing and provocative poses to sell a pair of jeans, make-up, shoes, or whatever is the latest fad. In some ads it is unclear even what is being sold, other than the sexual image.

The focus groups were each shown slides containing these, and other, advertisements. A large number of the boys viewed the girls in the "sexy" ads, as "bad" girls (the negative bad). When asked what could be done to make ads better, one boy remarked, "Yah do some girls in bikinis in some or something." In the female focus groups the girls viewed these images of thin girls as girls who were petty and conceited, and who would probably not be their friends. In addition, the literature review revealed that often younger girls in these ads are not consciously chosen to be sexy or perceived as a sex object. This decision is made by the team of advertising experts.

(Merskin 2004) The message the ad conveys is carefully orchestrated by these experts.

THE "THIN IDEAL"

The proliferation of "thin ideal" due to media portrayals is unhealthy because of its negative effects on young girls' body images and self esteem. Feelings of inadequacy and body dissatisfaction, in many cases, lead young girls to eating disorders, such as Anorexia Nervosa, Bulimia, and unhealthy dieting or eating habits. Botta (1999) concluded that "media do have an impact on body image disturbance, both directly through body image processing and indirectly by encouraging adolescent girls to endorse a 'thin ideal' and by establishing what they see as realistic ideals." In addition Harrison reported, that "increased exposure to thin ideal bodies in magazines was related to increased eating disorder symptoms for adolescent girls." Boschi, V., et al (2002) concurred, "Mass media, by means of confusing and subliminal messages, affect adolescents' lives to a certain extent and they tend to perceive these 'modern virtues' as targets to be achieved."

BODY IMAGE STATISTICS

(Compiled by Dr. Kate Hausbeck, and Nicole Rogers)

- 81% of 10 year olds are afraid of being fat. 51% of 9 and 10-year-old girls feel better about themselves if they are on a diet. Mellin et al. 1992.
- Anorexia is the number one cause of death among young women. Five to ten percent of girls with anorexia die within ten years of the onset, 18-20% die within twenty years of the onset, and only 50% report ever being cured. National Association of Anorexia Nervosa and Associated Disorders www.anad.org
- In 2001, 62.1% of ninth-grade girls reported attempting to lose weight compared with 31.8% of ninth-grade boys. CDC. 2002.
- Girls who are involved in sports are less likely to consider themselves overweight. In 2000, 27% of female athletes thought they were overweight, compared with 40% of non-athletic girls. The Women's Sports Foundation. December 2000.

CULTURAL DESENSITIZATION

The desensitizing of the public to these images and ideals is an elaborate process, which has taken several years to cultivate. This is of course an unintentional side effect of the media's saturation of the market with ever more shocking and taboo imagery. The haste and competition has produced a vicious cycle of shocking, out doing, and outrageous depictions, which have left the general public desensitized. The images that were shocking yesterday are accepted as norms today.

CONCLUSION

The research and findings indicate that in regards to the sexualization of young girls by the media, there are real reasons for concern. However, it is important to note that although there are real reasons for concern, this research cannot say for sure that there is a causal correlation between images and their effects on youth. Nevertheless, it is clear more research needs to be done.

However, in light of the overwhelming amount of research, which suggests that adolescent girls often compare themselves to the images in magazines, and then strive to achieve the ad's idea of "perfection" in unhealthy ways, advertisers and other forms of media should adopt more responsible policies or at the very least sponsor further research.

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MCNAIR MENTOR

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NEVADA FOSTER PARENT SATISFACTION

BY SHANA BACHUS



INTRODUCTION

Nevada Foster Parent Satisfaction Surveys are used to aid the foster parents and the foster children's needs such as more available sources in the community and better designed programs from the private or non-private agencies. In February 2004, the Child and Family Services Review (CFSR) were conducted in the State of Nevada. In part, the CFSR evaluates the State in several areas regarding children's safety, permanency, and well-being. The performances of the State on these outcomes are compared to national standards and areas needing improvement are identified. The focus of the study is on the indicator "stability of foster care placement," identified as a critical area needing improvement.

The purpose of this study is to develop and administer a client satisfaction survey to current foster parents in the State of Nevada. Subjects involved in this study will be current foster parents in the State of Nevada. All foster parents are over the age of eighteen. The list of foster parents in Nevada will be obtained from the Division of Child and Family Services. A stratified random sample will be drawn, which will ensure equitable selection. The foster parents do not have to pay for participating in this study, but can do it voluntarily where their voice can be heard.

The recommendations from the Foster Parent Association of Nevada are relevant to client satisfaction surveys that are administered in other states. The results of this research will be presented to the

Division of Child and Family Services and the survey will become part of an annual evaluation process.

LITERATURE REVIEW

Foster Parent Satisfaction measures the critical factors and concerns of program evaluation. Foster parents whose child is receiving foster care services are measured on a scale of levels in satisfaction on the basis of their knowledge and experience with the foster care system. This gives opportunities for foster parents to have a voice in what issues and concerns about effectiveness of policies, programs, and services related to the placement of the child. Foster parents are the messengers in regards to common concerns and the children give feedback to entrust in the foster parents (Kapp & Vela 2004).

Young foster parents have little parenting experience because they do not have children of their own. Therefore, it becomes difficult and strenuous on the parent to have the child live in their home, especially with behavioral problems. The Foster Parent Association (FPA) has a program for those foster parents who need a support group for emotional support. The emotional support given to these parents offers suggestions, ideas, and makes recommendations on other alternative resources they can use to better assist their foster child appropriately (Hudson & Levasseur, 2002).

The United States General Accounting Office (USGAO) calculated the views of specialized professors and state officials. USGAO reports that there was a deficiency of support for positive recognition,

incentives, and reinforcement of foster parents. Some issues consist of low reimbursement rates, little respite to foster parents, and inaccessible agency staff. These issues influence foster parents to not continue fostering and close their homes to the children. These outcomes emphasize the need for agencies to be forced to make decisions in a timely fashion manner, reflect a mutual promise with foster parents and to the well-being of the children (Denby, Rindfleisch, & Bean 1999).

Reasons why foster parents quit to taking in foster children include a shortage of agency support, poor communication with caseworkers, and a lack of say in foster children's future and difficulties with foster children's disturbed behaviors. Continuing foster parents, former foster parents, and foster parents who are considering to quit say they receive less foster training and are not given a mentor. In addition, they say they need day care, transportation, and more funds with health-care costs (Rhodes, Orme, & Buehler 2001).

The retention of foster families can increase if caseworkers, institutions, and courts were to increase support and foster care training. Foster parents can take into consideration and persuade others to have the continued willingness to provide care, only if an additional monthly stipend would be added. If researchers were to have this data collected, evidence shown to support our concerns, and confront the county, then they would have a successful outcome. There would be more increased stipends, enhanced training, and support for foster parents on minimizing foster parent dropout (Chamberlain, Moreland, & Reid, 1992).

METHODOLOGY

First, there will be a pilot study conducted to test the initial sample survey that will be obtained from a list of all foster parents in Nevada provided by the Division of Child and Family Services. The pilot will be tested over the telephone with a small random sample of foster parents. A written version will be administered to 20-40 foster parents attending foster parent support groups in Las Vegas. The survey will also be given to 50 randomly selected foster parents throughout Nevada over the telephone. In addition, to completing the survey, these participants will offer feedback on the survey itself.

Based upon the results of the pilot study and suggestions made by the subjects, the survey will be modified into its final form. Letters of informed con-

sent will be sent to the subjects two weeks before the survey is conducted. The survey presents questions in the areas of satisfaction and experience with state caseworkers, foster care workers, foster parent training classes, compensation, empowerment, availability of services and other areas needing improvement. This may include if the match is well fitted between the foster parent and the foster child, and several relevant demographic questions. These participants will then be called over the telephone to take part in the survey that will only take fifteen minutes.

FINDINGS

One of the outcomes assessed was whether children have permanency and stability in their living situations. In order to determine whether Nevada meets the national standard of this outcome, six specific items were examined including foster care re-entries, stability of foster care placement, needs, the inability of the agency to find an permanency goal for the child, reunification, guardianship, or permanent placement with relatives, adoption, and permanency goal of other living arrangement.

The indicators identified for the "stability of foster care placement" is a critical area needing improvement. The CFSR identified several reasons why children experienced multiple placements including a lack of appropriate resources to meet the child's placement needs, the inability of the agency to find an appropriate permanent or long-term placement when the child entered foster care, and a lack of effort on the part of the agency to support a placement that was at risk of disruption.

SUMMARY

In completing the surveys, results compared the current open and closed homes on how satisfied they were with the foster care system, what predicts whether people will keep their home opened or closed, what factors predict the overall satisfaction with the experience, caseworkers, foster parent training, if reimbursement is fair and on time, the availability of services and the satisfaction, placement of children and how well of match between the foster parent and the foster child.

The preliminary data that was collected was through quantitative means of all the respondent's opinions on satisfaction. Descriptive statistics will be used in the areas of service provided by the county such as foster parent training, respite care, reimbursements, empowerment, and availability of services, etc.

This research design seeks to understand human experiences such as foster parents from their perspective and their own experiences. It is objective and will seek to explain and predict why foster parents want to keep their homes opened or closed.

Next, the research staff will make a comparison on how satisfied the foster parents are by having current opened homes or closed homes, and what factors predict overall satisfaction. The data collection is occurring with thorough in-depth interviewing and participant observations over the telephone. Researchers would use deductive logic, test the hypothesis, data analyzed after collection, and would conduct a reliance on standardized instruments to measure.

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INVESTIGATING ADDICTION AND RECOVERY

BY KARMEN K. BOEHLKE



INTRODUCTION

This study examines relapse as it occurs during the recovery process from a psychoanalytic perspective. It hypothesizes that both family environment and religious orientation during childhood may influence the degree of the development of "psychiatric severity" and subsequently impact relapse rates. If the two variables are related to a higher incidence of relapse, they may need to be given greater attention within present addiction treatment plans in order to increase treatment efficacy and, thereby, reduce relapse rates during the recovery process. In order to explore this hypothesis, recovering alcoholics were asked to complete a survey that incorporated a number of variables generally related to alcoholism and recovery, as well as questions specifically related to family environment and religious orientation during childhood. After being separated into two conditions, the "relapse" condition and the "no-relapse" condition, the resulting data was then compared.

Referring to a relationship with a substance or activity that is excessive or compulsive, addiction is not simple. It is not a single type, but rather it involves variation in neurobiology, comorbidities, conditioning, environmental cues, social context, culture, and personal/social factors (Tims, Leukefeld & Platt, 2001). The complexity of addiction resultant from the reciprocal relationships between the multiple variables that promote behavior excess argues against the notion that individuals can easily stop

use. Statistics indicate that roughly 60-80 percent of individuals who begin treatment for problem dependencies relapse within twelve months of their starting date.

LITERATURE REVIEW

Project MATCH, an eight-year study on alcohol abuse, attempted to link particular kinds of alcoholic patients with specific interventions in order to improve treatment efficacy and reduce the incidence of relapse. Among the ten variables assessed within the three treatment frameworks only one, severity of psychological disturbance, referred to as "psychiatric severity," demonstrated any significance. Patients in better psychological shape had more abstinent days following the twelve-step facilitation program than did patients in the cognitive-behavior condition, although patients in worse psychological condition did not fare differently across the three treatments (Davison, Neale, & Kring, 2004).

Addiction, from a purely biochemical standpoint, is solely the responsibility of the brain, generated by self-induced changes in the brain's neurotransmission processes (Milkman, & Sunderwirth, 1987). Recognizing addiction as a brain disorder, the United States National Institute on Drug Abuse (NIDA) has funded extensive neuroimaging research which has shown that the addict's brain is distinctly different from the non-addict's brain. Analogous to a light switch, prolonged drug use seems to throw the brain into a state of addic-

tion, characterized by compulsive drug seeking and use (Keane, 2002).

While it is generally accepted that alcoholism is a physiological disease process largely genetic in origin, it can be triggered or complicated by environmental factors (Blum, & Payne, 1991). Therefore, neurological models like NIDA's are reductive and incomplete. Excluded are factors of ecology including the environmental influences of an individual's familial, psychological, and social history. Inexplicable within a neurological model are those genetically predisposed individuals who never develop the disease, while, conversely, those who do despite no such biological heritage. Experiments with ordinary water-preferring rats have demonstrated that when they are placed under severe stress, induced by random shocks, they, too, develop a preference for alcohol. In addition, they continue to drink, even increase their intake, long after the experimental shocks are stopped (Pluymen, 1999).

However, most addictionologists – even those who disagree about matters of causation and treatment – agree that low self-regard is a crucial factor in all forms of addiction. The chronic absence of good feelings about oneself can provoke a dependence on mood-changing activity. Addiction can serve as an antidote for the psychic pain caused by feelings of unworthiness developed through childhood experiences (Milkman & Sunderwirth, 1987).

Within the psychoanalytic perspective, a sense of low-self worth can stem from the development of neurosis which can precede the onset of alcoholism, especially among children raised in alcoholic environments. Children of alcoholics not only run an increased risk of developing alcoholism based on genetic inheritance, they are also exposed to a number of hazards that can negatively impact their sense of self-worth. Negative mood states developed while growing up in an alcoholic family include fear, anxiety, anger, shame, and guilt, any or all of which serve to weaken or destroy the sense of self and arrest, if not prevent, the development of a healthy sense of self-worth (Blum, Payne, 1991). The individual may eventually become neurotic because there is little opportunity to build up initial self-confidence due to the crushing experiences to which he or she is subjected to in childhood (Horney, 1945). The subsequent alienation from self can impair self-determination by preventing the

development of the authentic self. The individual then moves from being the driver to being driven in order to satisfy neurotic drives with little regard for his or her well-being (Horney, 1950). Attempting to allay the anxiety resulting from the intrapsychic conflicts characteristic of neurosis, an individual may begin to drink (Horney, 1950). Additionally, religious experience can be intertwined with psychological make-up (Genia, 1995). In light of Freud's indictment of religion as "the universal obsessional neurosis of humanity (Genia, 1995)," childhood religious experiences may also influence the development of intrapsychic conflicts.

Gratifying behavior of any kind, therefore, tends to be repeated because it reduces conflict and tension (Milkman & Sunderwirth, 1987). It is human nature to cling to the safety and security of familiar ways of thinking and behaving even when they are maladaptive and self-destructive. Yet, in order to grow psychologically, emotionally, and spiritually, less mature or unhealthy ways of thinking and behaving must be relinquished (Genia, 1995). However, the transition into greater maturity and recovery is rarely easy as demonstrated by the high incidence of relapse during the recovery process.

METHODS

Data was gathered through self-report surveys administered to recovering alcoholics who were solicited from traditional self-help group twelve-step meetings, specifically Alcoholics Anonymous (AA) meetings. Participants had to be at least 18 years of age and possess a minimum of one year of continuous sobriety. The survey addressed a broad range of variables related to alcoholism and recovery in general. However, data analysis focused more specifically on the familial environment, including parental alcohol use, as well as parenting techniques, defined as authoritarian and permissive, and the religious orientation, defined as punitive and grace-oriented, to which the individual was exposed as a child. Separated into two conditions, the data was then compared and analyzed to determine if familial environment and religious orientation might constitute aspects of "psychiatric severity" and, subsequently, impacted relapse rates.

FINDINGS

Number of Subjects:	51
Number of Subjects in "Relapse" Condition:	40 or 78%
Number of Subjects in "No-Relapse Condition:	11 or 22%

Variables Measured	"Relapse" Condition	"No-Relapse" Condition
Alcoholic parents	50%	82%
Parents who drank socially	42%	18%
Parents who did not drink	8%	0%
Authoritarian parents	63%	55%
Permissive parents	37%	45%
Religious orientation: Punitive	48%	64%
Religious orientation: Grace	8%	0%
No religious orientation	27%	27%

The percentage of subjects in the "Relapse" condition is consistent with documented statistics. However, a higher percentage of participants in the "No-Relapse" condition reported being from both alcoholic families and punitive religious orientation than those in the "Relapse" condition. These findings are neither consistent with Project MATCH results, nor do they support this investigation's supposition which suggests that being raised in an alcoholic household and/or being raised with a punitive religious orientation may increase "psychiatric severity" and, subsequently, increase an individual's likelihood for relapse. If this were the case, it would be expected that the percentage of research participants in the "Relapse" condition raised with alcoholic parents and/or with a punitive religious orientation would be larger than the percentage of those in the "No-relapse" condition. Clearly, the data does not support this idea.

CONCLUSION

Despite the tremendous advances made in the study of addiction, the path to recovery remains a complex problem that is complicated by a vast number of variables that confound both researcher and addict alike. However, in order to reduce, if not eliminate, the human suffering and the economic and social costs incurred by addiction, determined and diligent research endeavors must continue.

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MICROBIAL COMMUNITY AND GEOCHEMICAL ANALYSIS OF SILVER LAKE PLAYA

BY ANDREA FLORES



INTRODUCTION

A Playa, or dry lake, is a flat vegetation-free area at the lowest part of a desert basin. Playa sediments are normally underlain by stratified clay, silt, sand and a number of soluble salts (such as NaCl and CaCO₃). High salt content and elevated pH values tend to make playas inhospitable to most organisms (Gul et al. 2001). Although playas are normally dry, intermittent periods of precipitation allow an ephemeral lake to develop as a result of water draining from local mountain ranges. The incurrent of water carries many soluble minerals into the basin, which become concentrated and can precipitate out of solution as the water dries. Despite the visibly barren landscape, playa surfaces are dynamic ecosystems. Though conditions are unfavorable for most eukaryotic organisms, microbial life has the ability to survive and even thrive under these circumstances. Exploring the microbial diversity in these harsh and arid environments presents an opportunity to isolate and characterize novel microbes, as well as give insight to possible ways of life on other planets.

LITERATURE REVIEW

Playas in southern Nevada/California were originally part of Pleistocene lake and river systems that dried up around 9,000 years ago, at the end of the last glaciation cycle. The full extent of these systems may seem surprising today, given the dry landscape that dominates the modern day Mojave region. A glimpse of the past was revealed from December 2004 to February 2005, when there was a sudden

influx of rainfall in this region, making some playas look like their Pleistocene counterparts. This presented a unique opportunity to study the geochemical changes and microbial populations as a water-laden playa dries over time.

The hypothesis guiding this study is the following: as the water dries out from Silver Lake via evaporation or drainage into the soil, the chemistry of the playa will change from a relatively low salt concentration and slightly basic pH to a high salt concentration and more basic pH. The microbial community will adjust in accordance to this environmental change, from an initially diverse population to a less diverse community of haloalkophilic microbes. The given research's experimental design to test this hypothesis involves sampling multiple time points at various stages of playa water saturation: time period one (100%), time period two (50-60%), time period three (< 15%) and time period four (0%-completely dry). At each time point, samples will be collected for molecular analysis, chemical analysis, cultivation experiments and phylogenetic characterization. For cultivation we designed a series of solid and liquid media that we predict will simulate the various environmental changes the playa will go through as the water dries out, with varying amounts of salt and pH values.

METHODS

Samples were collected from Silver Lake, located approximately three miles north of Baker, CA. Water was analyzed on-site for temperature, conductivity,

dissolved oxygen, pH, and oxygen-reduction potential using a YSI 556 Multiprobe System. Water chemistry was also analyzed on-site using CHEMet Test Kits for nitrate and total iron, and off-site using ion exchange columns to test for major ions (Figure 1). In sterile centrifuge tubes water was collected for cultivation; these tubes were kept cold until processing, which was between 24-48 hours after sampling. Sediment samples were attained using a sterile syringe with the tip cut off to enable a core of sediment to be taken. Sediment core samples were used primarily for molecular work and were transferred directly to dry ice in the field and then to a -80°C freezer upon return to the lab.

CULTIVATIONS AND MEDIA

Solid and liquid media was prepared for cultivating heterotrophic microbes. A dilute nutrient media was employed to simulate the environmental conditions, consisting of 0.2 g/L yeast extract, 0.2 g/L peptone, and 0.2 g/L dextrose (Schlesner, H. 1987). Concentrated stock salt solution (30%) was made using 300 g/L of NaCl, 2.0 g/L MgSO₄, 0.036 g/L FeCl₃, 0.1 g/L CaCl₂ and diluted to desired salt concentrations in media preparation (Tindall, B.J. 1992). A 10x stock of 50 g/L Na₂CO₃ was prepared and diluted to 1x (5 g/L Na₂CO₃) for use in the media to raise pH. 900 mL of salt solution/nutrients and 100 mL of 10x Na₂CO₃ was autoclaved separately and brought to appropriate pH with filter sterilized 10M KOH or 15M HCl. Broth was made for Most Probable Number (MPN) tubes, and plates were made with the addition of 30 g/L agar. MPN tubes were scored as described by de Man (de Man, J.C. 1975); plates were scored by counting colony forming units (CFU).

MOLECULAR ANALYSIS

Sequence analysis of 16S rRNA genes were performed on isolates obtained from the dilution series plates. Polymerase chain reaction (PCR) was performed to amplify 16S rDNA using primers 9bF and 1512uR. Sequence reactions were performed using the primer 9bF, and sequence results were uploaded to public databases (NCBI, RDP) for identification. Sequences were aligned to an internal database, and phylogenetic analysis of sequence data performed using Treecon. Terminal Restriction Fragment Length Polymorphism (tRFLP) analysis performed on DNA extracted from playa sediment cores were accomplished using a FastDNA SPIN Kit for Soil. PCR amplification was performed using primers 9bF and fluorescently labeled 1406uR and digested with the endonuclease *Hha* I.

RESULTS AND DISCUSSION

MOLECULAR SIGNATURE ANALYSIS OF MICROBIAL DIVERSITY

As this study is primarily a cultivation-based effort, terminal restriction fragment length polymorphism (tRFLP) analysis was performed for each time period to provide a molecular basis of microbial community diversity. It is expected that the cultivation experiments will not represent the entire microbial community (Staley, J.T. et al. 1985), therefore we used the 16S rRNA gene as a microbial marker to give a more complete picture of what microorganisms are present at Silver Lake playa. It was predicted that the later time periods would be less diverse due to the more extreme nature of the environment as water leaves the playa. The comparative tRFLP analysis shows this to be true, as there is a decrease in diversity over time for Bacteria, while there is a slight increase in diversity for Archaea (data not shown).

GEOCHEMICAL ANALYSIS OF SILVER LAKE WATER

One crucial idea to the experimental design is that change in the environment will result in a change in the microbial community. It was therefore important to monitor the geochemistry of Silver Lake at each time point with the same rigor as the microbial population. It is predicted that as water leaves Silver Lake the salinity and pH will increase, and these two elements are measured directly in the field at the time of sampling. Field measurements show an approximate 10-fold increase in salinity and a slight increase in pH (data not shown). Chemical analysis shows a dramatic increase over time in many ions found in soluble salts, such as sodium and chloride (Figure 1). Ion analysis showed that Silver Lake had a large number of cations and anions common to playas (Figure 1) (Camur, M.Z et al. 1996; Hamdi-Aissa, B. et al. 2004; Pakzad, H.R. et al. 2004), which roughly matched the salts used in our media preparation. Ion concentration will increase as water evaporates until the volume is insufficient for mineral solubilization, as is evident with nitrate (Figure 1). Minerals with nitrate are not as soluble as other evaporates, such as halite or gypsum, and have precipitated out of the water.

CULTIVATION OF HETEROTROPIC MICROBES

To study the change in the microbial community towards halophilic and alkophilic microbes over time, a series of media was designed to simulate the range of environmental conditions expected to occur as the playa dries. To model a possible range of salt concentrations, a salt series of media was con-

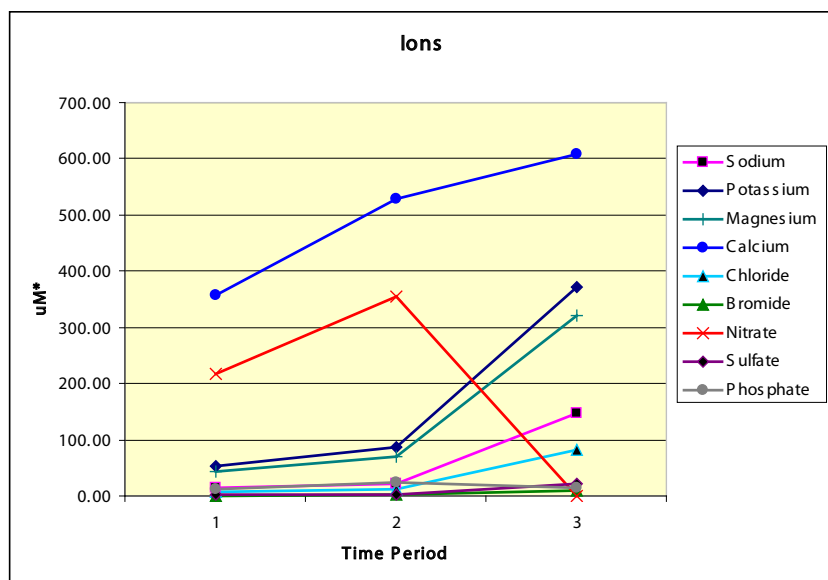


Figure 1. Geochemical analysis of Silver Lake water.

*Sodium, Chloride, and Sulfate are measured in mM.

structured at concentrations of 1%, 10%, and 25% (all at a constant pH of 8). To simulate a possible range of pH values, a series of media with pH 8, 9, and 11 was devised (all at a constant salt concentration of 1%).

At time period one MPN tubes and dilution plates show that most microbes cultivated were on low salt (1%) and slightly alkaline pH (8,9) plates (Figure 2). At time period two MPN tubes and dilution plates are similar to time period one, with most successfully cultivated microbes being found on low salt and slightly alkaline pH. At time period three cells counts were extremely high, considering only heterotrophic microbes were accounted for. The MPN counts show an increase in cells/mL over time for each medium, with a drastic increase in 1% pH 11 from time period two to three (Figure 2). The highest cell counts were in 1% pH 8 & 9 media, with numbers reaching 10^9 cells/mL. A possible explanation for the dramatic increase in cell counts is that the media more closely resemble environmental conditions, which had TDS (total dissolved salts) at ~1% and a pH of ~9.

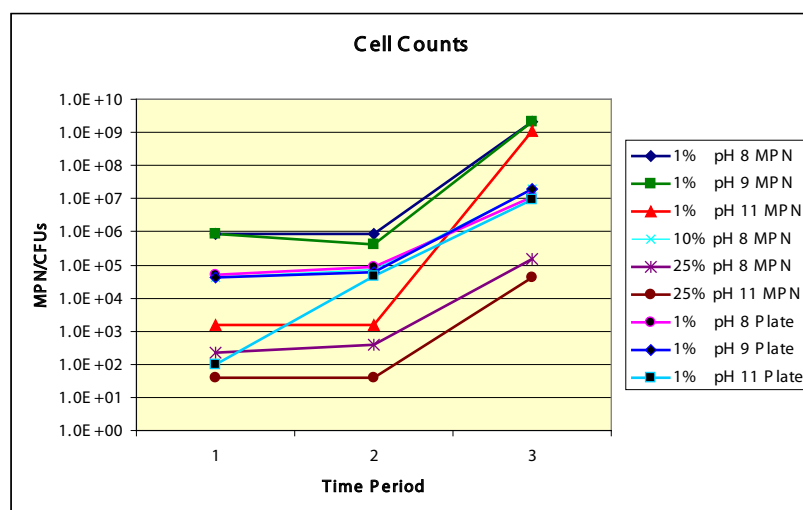


Figure 2. Cells/mL of liquid (MPN) and solid (plates) media.

One feature of our results that is noteworthy of attention is that cell counts were not consistent in liquid media (MPN tubes) versus solid media (dilution plates) (Figure 2). The plate counts show an increase in CFUs over time, though the overall plate counts are 1-2 orders of magnitude lower than MPN counts (Figure 2). Research staff speculate that this could be due to the origin of the samples, which were taken from water. This phenomenon has been previously observed, and broth versus plate cultivation methods have been debated in the past (Janssen, P.H et al. 2002).

SEQUENCE ANALYSIS OF ISOLATES

From the first four time periods 204 colonies have been isolated (~50 from each time period) and 21 isolates from time period one have been sequenced for phylogenetic analysis. As Figure 3 shows, isolates from Silver Lake fall into three phyla: Firmicutes (low G+C gram positives), Proteobacteria, and Bacteroidetes. All Firmicutes isolates showed high sequence identity with cultured and described bacteria from three genera: *Bacillus*, *Halobacillus*, and *Marinibacillus*. All isolates grouping with *Halobacillus* and *Marinibacillus* (SL1.8, SL1.10, SL1.12) were isolated from 10% salt pH 8 plates, with the exception of SL1.23, which was isolated on 1% salt pH 9 media. All Proteobacteria isolates (SL1.2, SL1.20, SL1.21, SL1.26) grouped within the alpha class and were isolated from all possible low salt (1%) medias. These isolates were all very similar in 16S rDNA sequence to each other, and all matched very closely to *Loktanella vestfoldensis*, a bacterium recently discovered near the Vestfold Hills in Antarctica (Tappen S.V. et al. 2004).

CONCLUSION

Previous studies in high salt environments (Demergasso, C., et al. 2004) show a dominance of Proteobacteria and Bacteroidetes, which could be indicative of the microbes to be found in the later time periods with higher salt concentrations. The remaining isolates grouped within the phylum Bacteroidetes and were shown to have the poorest sequence similarity to known and unknown relatives of any of the isolates. SL1.1 and SL1.6 show sequence similarity to a partial sequence of an inappropriately named "*Bacillus* sp. Mali 19", with the next closest cultured relative being distantly related *Pontibacter actiniorum*. All of the Bacteroidetes isolates are good potential targets for future studies as candidates for new genus or species level microbes.

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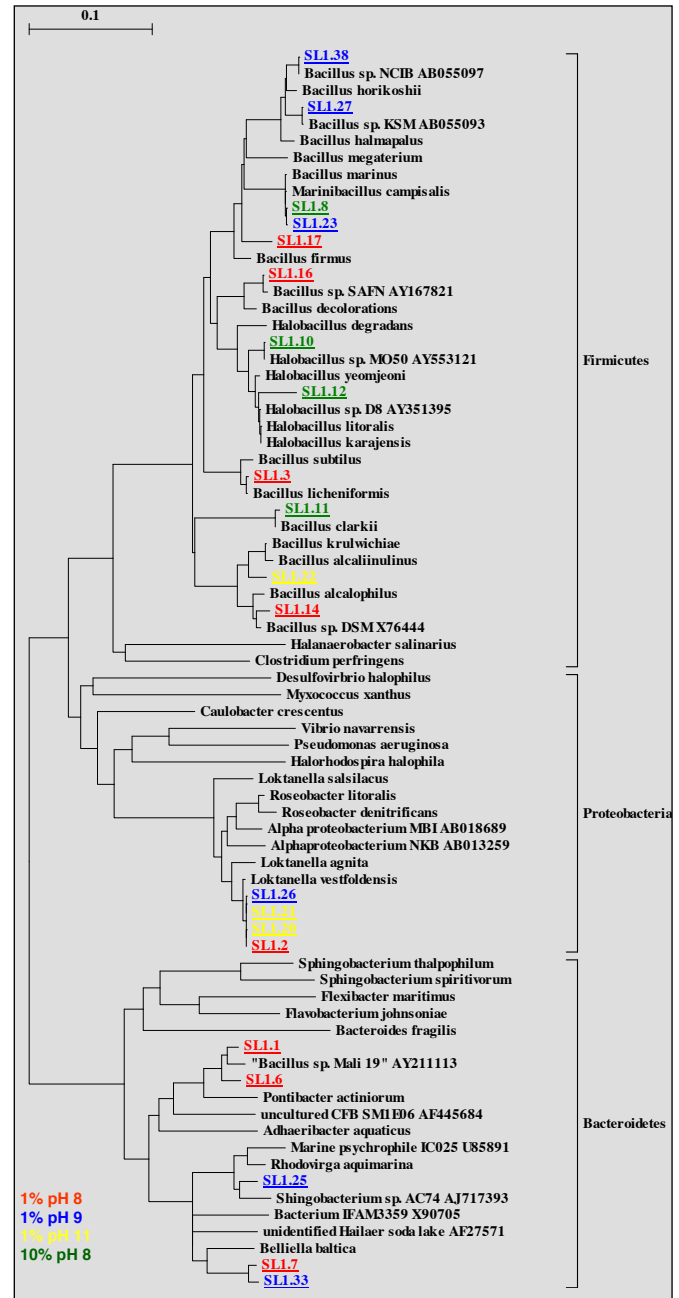


Figure 3. Phylogenetic tree of 21 Silver Lake isolates from time period 1.

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RACIAL REDISTRICTING: MINORITY POLITICAL REPRESENTATION IN NEVADA

BY ALDEN KELLY



INTRODUCTION

It has been argued that redistricting is one of the most important events in our political system. The long list of court cases involving disputes over redistricting is evidence of this (e.g., *Reynolds v. Simins* 1964; *Wesberry v. Sanders*, 1964; *Shaw v. Reno*, 1993; *Miller v. Johnson*, 1995; *Hunt v. Cromatie*, 2001). Yet the process of redistricting is “virtually invisible” to the public (Greenberg and Page 2003; Butler and Cain 1992) and is therefore subject to the competing interests of many actors. Damore (2002) suggests that the politics of redistricting is an insider’s game, where only those actors with a large stake in the outcome participate in the process. If this is the case, one might expect minority groups to play an important role in the redistricting battles since redistricting has been instrumental in aiding minorities in acquiring political office and representation; however, that is not always the case.

The purpose of this study is to examine the application and the effects of racial redistricting in Nevada. The first goal of the project is to explore how redistricting has been applied to local and state electoral boundaries. The goals and objectives of redistricting can be highly complex and even contradictory. Some political actors may simply wish to maximize incumbency advantage; others have partisan control of the local or state legislature as a main objective; while some may attempt to increase ethnic and minority representation. The second goal of the study is to evaluate how racial redistricting has

affected political participation and representation of minorities across Nevada.

LITERATURE REVIEW

Redistricting can be subdivided into two, often competing components: racial and partisan redistricting. These two components are closely interconnected with different types of political representation: descriptive versus substantive. Which type of representation, descriptive or substantive, is more important or beneficial to minority groups continues to be discussed and debated by public officials, political activists, and scholars.

Claudine Gay (2001) purports that the creation of minority-majority districts has resulted in increased numbers of black and Latino representation in government. She suggests that minority-majority districts will lead to greater political activism among minorities than that of non-minority majority districts. Similarly, Lublin (1999) concludes that racial redistricting is indeed a vital factor to the election of more blacks at both the state and federal level. He finds that districts that are more than 55% black have a much higher probability of electing a black representative to the House of Representatives.

Although there seems to be strong consensus as to the benefits of redistricting concerning descriptive political representation, there is concern that such gains come at the cost of substantive policy representation. Lublin (1999) qualifies his findings regard-

ing the benefits of redistricting by writing that while redistricting in theory aids descriptive representation of blacks, it has not been helpful in aiding minority substantive policy interests.

Cosgrove and Overby (1996) concur that there is a tradeoff among minority voters and their ability to achieve substantive political gains. By creating majority-minority districts blacks in particular are packed into a few majority districts that may cause minorities to lose sight of their goal, making them more inclined "...to undermine their own interests by trading off greater influence for a larger number of safe minority seats" (Cosgrove & Overby 1996, 541).

METHODOLOGY

Most of the literature regarding racial redistricting focuses on the southern states. Very little research has been directed towards the western region of the United States. The State of Nevada provides an interesting case study because of its rapid growth in population and diversity. In addition, Nevada is one of only 13 states that have multi-member districts within its state legislature.

Examination of state and local government documents, newspaper articles, and in-depth interviews with elected officials and political elites will provide the qualitative data for the analysis of the application of redistricting in Nevada after the 1990 and 2000 census. Data for the U.S. Census will be used in conjunction with election data from the Nevada Secretary of State to analyze the impact that redistricting had on minority representation in local and state offices. Interviews with public officials and interest groups will supplement this quantitative analysis and provide a normative assessment of the redistricting process.

FINDINGS

The qualitative and quantitative data are still being collected. The results of the study will be available once collection, coding, and analysis are complete. Preliminary analysis of the literature and the Nevada political context suggest that redistricting is a complex competition between a variety of groups (racial, partisan, and geographic) vying for a variety of gains (racial, partisan, and geographic) (Damore 2002).

Partisan considerations in many cases eclipse racial redistricting objectives. Because members of a par-

ticular party have an incentive to maintain the status quo, racial gerrymandering was reduced. This has given fewer opportunities for minorities to gain descriptive representation in the local, state, and even national politics. Although historically redistricting has been instrumental in strengthening minority political participation, the 2001 Nevada redistricting of the state legislature produced only 2 (out of 42) assembly and 1 (out of 19) senate districts that contained Latino populations of 60 percent or greater (Damore 2002).

Another layer of complexity in assessing the effects of redistricting is the existence of multimember districts in the Nevada State Senate (5 of the 16 districts are multimember from 1991 to 2001). Evidence from prior studies suggests that multimember districts decrease the probability of minorities gaining descriptive representation (Gerber, Morton, and Rietz 1998). The reduction in the number of multimember districts in the State Senate may provide some modest benefits to minority gains in political office especially since the five multimember districts contained some of the highest proportions of Latino and black voters (Legislative Counsel Bureau 2001).

CONCLUSION

The battle to control the process of drawing the electoral boundaries is so contentious because redistricting has such an important impact on the shape and makeup of the political landscape. Some have argued that the composition of a legislature is determined more by how the districts are drawn than how the electorate votes. Even though redistricting is so critical to the outcomes of our democratic electoral system, the redistricting process elicits only limited attention from the media and the general public. Even those minority groups that have much to gain from the process stand on the sidelines because they are often torn between competing goals and objectives.

During the 2002 congressional elections, the Congressional Hispanic Caucus and the National Association of Latino Elected Officials clashed on whether to promote substantive policy representation or increase racial descriptive representation. These conflicts within and between groups underscore the complexity of the redistricting debate. In order for redistricting to be effective in increasing minority political influence, minority groups need

to navigate the trade offs between substantive and descriptive representation (Gelman & King 1994). Understanding how racial redistricting effects Nevada in this context will allow us to understand the challenges and risks minorities will face in the upcoming years and the approaching 2010 census and reapportionment.

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SOCIAL EXCHANGE AND SATISFACTION IN ROMANTIC RELATIONSHIPS AMONG LATINOS

BY ERICK LOPEZ



INTRODUCTION

The leap into the study of romantic relationships and satisfaction mediated by social exchange is an easy one to make considering the culmination of two previously investigated factors: relationships and social exchange theory. Results obtained from such a study may offer insight into the field of social psychology, as well as the potential application of findings to existing romantic relationships. This study attempts to strengthen previously established findings, not just among entry-level collegiate students, but specifically to a range of diverse Latinos across a broad range of university academic standings and into the community at large. Such inclusivity will foster external validity and scientific generalizability.

BACKGROUND ON RELATIONSHIPS

Social relationships and pair bonding have had ubiquitous importance in human history. One is therefore enticed to ask, "Why have such bonds endured for thousands of years?" It appears that social bonds are conducive to and vital for the survival of the human organism. Living and working in small, cooperative groups has been the primary survival strategy for the human species; social organization shielded early humans from the perils of the natural environment (Reis & Collins, 2004). Evolutionary psychologists propose that contemporary forms of social behavior derive from social-behavioral systems. Such systems are coordinated patterns of feeling and behavior that

have materialized in order to solve survival-relevant problems in the course of human evolution; specific examples include feeding, mating, exploring, and fleeing (Diamond, 2000). It is important to note that with the emergence of upright walking, pair bonding (a rarity among other primates) brought about the central evolutionary departure in hominids (Djickic & Oatley, 2004).

Social bonds are such a recurrent theme throughout primate history because such relations provide rich emotional, mental, and physical support from the harsh realities of our environment. Strong evidence indicates that relationships are significant in nearly every domain of activity. From infancy to old age, having friends and relating successfully to other people is associated with favorable outcomes in many note-worthy domains such as school, work, coping with negative events, adaptation during life transitions, parenthood, self-worth, and emotional well being (Reis & Collins, 2004). Various data indicate that relationship contexts have the potential to influence an extensive range of cognitive, emotional, and behavioral processes (Reis & Collins, 2004). The sphere of influence of interpersonal relationships can affect many factors including mortality rates, recovery from coronary artery bypass surgery, functioning of the immune system, reactions to stress, psychiatric disturbance, and life satisfactions. Such affects do not appear to be artifacts of personality, temperament, behavior, or lifestyles, but instead reflect the direct influence of

relationship events on biological processes (Reis & Collins, 2004).

Relationships are an essential part of human life and begin within the womb; some remarkably vital relationships include mother-infant, parent-child, sibling-sibling, friend-friend, teacher-student, and lover-lover relationships. An individual's closest relationships play a unique role in facilitating psychological and physical health (Diamond, 2000) social bonds specifically in the form of friendships, provide support, mutual caring, trust and closeness (Diamond, 2000). Bowlby suggested that attachment is an evolved behavioral system designed to regulate infant proximity to a protector, which consequently maximizes chances for survival. Because human infants are born exceedingly developmentally immature in comparison to other species, they require a prolonged period of vigilant care and feeding immediately after birth in order to ensure survival (Diamond, 2000). Investigations with nonhuman species and with human children raised in orphanages with inadequate care conditions, have demonstrated that even minor deprivation contact with responsive individuals results in abnormal development of the brain and hormonal systems that regulate coping with stress (Reis & Collins, 2004). The deterioration or failure of the aforementioned relationships to transpire, may rob one of many advantageous effects.

Aside from the inherent functionality of such bonds for survival, relationships, particularly romantic ones, offer a highly conducive and rich arena for physical, mental and emotional enjoyment of one another, which is especially beneficial to the development of the individual. Long-term romantic relationships provide health benefits including longer life and less disease that outweigh the benefits of general social support (Diamond, 2000). Investigators have demonstrated that individuals use close relationships to shield against anxiety of impending death; additionally, close relationships soothe existential anxiety (Djikic & Oatley, 2004).

BACKGROUND ON SOCIAL EXCHANGE

The concept of social exchange, deriving from a theory of economics, has been applied to interpersonal interactions because of its high degree of compatibility as a formula for quantifying the resources and process of exchange in relationships. Simply put, social exchange (SE) is "the notion that mutually beneficial exchange underlines all social

and personal relationships" (Cole & Teboul, 2004). SE is an ever-present and predominating operation that occurs in all social interactions and must be examined and scrutinized because its relevance is imperative to the functionality and condition of social interactions. Functioning under notions of social behavior, SE dictates that our interactions are underscored by considerations of rewards and costs, or the expectations of rewards and costs (Laursen & Jensen-Campbell, 1999). Profit is the result of rewards minus costs, and is calculated from the cost minus rewards. The SE theory of interpersonal relationships indicates how comparisons of costs and benefits of staying in relationship are continually made, providing that relationships are likely to dissolve when cost exceed benefits. When continued interactions are expected, the potential for mutually beneficial exchange becomes more viable as long as collaborative efforts on behalf of both individuals are likely to result in self-gain (Cole & Teboul, 2004).

It is suspected that couples that do not maintain at least five positive contributions to one negative run a high risk of separation. Love is seen as a market with its own rate of exchange, which both over benefiting and under benefiting are to be avoided (Djikic & Oatley, 2004). Concepts of under benefiting and over benefiting bring about important issues of equity and inequity. As equity theory provides, dissatisfaction is likely to occur if one receives an excess amount, or a diminutive amount of rewards. Lloyd, Cate, and Henton (1982) posit that rewards become less salient as relationships become more intimate. For casual relationships, equity was the best predictor of satisfaction, while for intimate relationships, the salience equity decreased. Findings reveal that the less equitable romantic couples perceived their relationships to be, the more distress they feel. In a study by Inoue (1985), subjects tried to restore equity according to the degree of inequity they perceived. Subjects who felt they were over benefiting in the relationship resolved the issue by attempting to increase their own input, and subjects who felt under benefited in the relationship attempted to increase their partners' input. It was reported that subjects who felt they were greatly over or under benefited were tempted to sever their relationships (Inoue, 1985). In contrast, Sprechner's (2001) longitudinal study indicates that once relationships that have entered the stage of long-term commitment, that the concern of equity may no longer be as salient. Furthermore, she asserted

that over benefiting tends to have much lower salience than under benefiting and that the latter tends to be component that is related to the most distress and dissatisfaction in relationships.

As outlined by Foa and Foa (1974), the most commonly exchanged resources include information, services, money, love, status, and material goods. The exchange of resources is an undeniable part of our everyday lives and may occur without an individual's knowledge. It is suggested that the initial acquaintance stage of relationships is merely a period of time in which individuals consciously or unconsciously ascertain the rate of exchange between him/herself and his/her partner and whether or not one will be satisfied with the potentially continuous exchange of such resources (Laursen & Jensen-Campbell, 1999). Value is based on the objective criteria a particular person or object, while the process of determining such a value is labeled "appraisal". Any given individual has an appraisal value, which is based on "marketable" qualities such as attractiveness, industriousness, pleasant personality, and so on (Djickic & Oatley, 2004). Sprechner (2001), provided that exchange of resources includes not just physical ones such as material goods and sex, but broader categories such as love, information, services, status and money.

The pillars of satisfying romantic relationships have long been sought in an attempt to identify relationship shortcomings with the incentive of strengthening relationships so as to increase satisfaction. Thus, this study is concerned with the hypothesis that romantic relationships satisfaction and SE correlate, specifically the higher the amount of positive SE, the higher the amount of relationship satisfaction. It is a positive correlation. However, the limited research in this area has only been conducted with European-Americans. The current study will extend the research to the Latino population. It is expected that Latinos will not be drastically dissimilar from European-Americans in this aspect of relationships, and by establishing this assertion, it will be demonstrated that Latinos too, operate on a fundamental basis of SE in their romantic relationships. Furthermore, this research will demonstrate that this theory is generalizable across a large span of diverse populations, which is the aim of many theories in psychology and of the social sciences in general.

METHODS

This quasi-experimental research endeavor is being conducted principally by the administration of three questionnaires: one that measures the giving of resources, one that measures the receiving of resources, and one that measures the relationship satisfaction. Questionnaires will measure seen resources: information, love, money, status, services, material goods, and sex. Sex is being included as a resources dimension because from the social exchange perspective of interaction in romantic relationships, it is often seen as a chief resource that is often for sale with many interested buyers, especially in heterosexual relation in which women sell and men buy (Baumeister, 2004). Romantic relationships are unique in the aspect that although friendships provide companionship, affiliation, and emotional support, romantic partners may also offer the opportunity for sexual activity (Kuttler & La Graca, 2004). One page of simple demographic questions will be administered for two chief purposes: to observe if there are any distinct patterns among the categories of age, country of origin, amount of time in the relationship, level of education, and socioeconomic status, and to ensure that subjects are Latino or Latin origin, and that these are heterosexual individuals who are currently in a romantic relationship. Upon gathering a sufficient sample size, tentatively set at a minimum of 125 couples (250 individuals), correlation coefficient data analysis will be performed, using the Pearson product-moment correlation coefficient. This statistic will be used to measure the strength of the relationships between interval levels of data. All administrations of the questionnaires and consent forms will take place on the campus of the University of Nevada, Las Vegas. Questionnaires will be administered during general meetings of various on-campus student-based Latino organizations. Permission to disseminate questionnaires has been received by the Executive Board members of respective University of Nevada, Las Vegas Latino organizations. It is expected that 250 couples will not be able to be collected from on-campus student organizations alone. Therefore, radio announcements may be required to gather more subjects from the general population. Such announcements are to aired four times a day for two consecutive weeks (Monday through Friday) on 1340 AM Spanish radio.

PARTICIPANTS

Subjects will be selected based upon the following criteria: they shall be healthy adults 18 years and older, and heterosexuals who are currently in romantic relationships, sampling from a Latino-based population is the distinctive variable of this study; all other extraneous variables are to be avoided. The purpose of sampling from a heterosexual pool and not from a homosexual and bisexual pool is to decrease the extraneous variables; previous investigations thus far have exclusively measured heterosexual couples. Couples who are currently in romantic relationships are sought because recall rates of past relationship experiences may be inaccurate and subject to error in remembering the past, compared to measurements of currently existing romantic relationships; Additionally, such a selection will decrease unnecessary deliberation of the logistics and details concerning a maximum amount of time that may pass after romantic relationship dissolution while still maintaining eligibility to be included in the study in order not to sacrifice accurate and concrete findings.

Samples will initially be gathered from an on-campus Latino student organization including Student Organization of Latinos (SOL), Movimiento Estudiantil Chicano de Aztlan (MEChA), Society of Hispanic Professional Engineers (SHPE), Kappa Delta Chi (KCHI) and Sigma Delta Alpha (SDA). Sampling from the general population may be required to obtain sufficient data. These participants will be recruited from 1340 AM Spanish Radio and will be given the survey at the campus of the University of Nevada, Las Vegas.

DISCUSSION

Data is currently being collected but is it expected that Latinos who are currently in romantic relationships will have higher rates of satisfaction in their associations when there is constant and abundant exchange of resources between both people in the relationship. Reversibly, the same is expected, that when Latinos have low rates of resource exchange in their romantic relationships, low rates of satisfaction are likely to occur, thereby increasing the potential for relationship dissolution or conflict. The over benefiting of one partner is not expected to be as salient as the under benefiting in these relationships. Furthermore, individuals who receive more rewards than their partner in a relationship are likely to attempt to make interaction

more equitable and balanced between the couple, but are not likely to initiate relationship termination. Gross over benefiting may lead to feelings of guilt and remorse, but are not strong predictors of relationship dissolution on the benefactor's side. If one partner is receiving gross under beneficence that is a stronger, more salient indicator of relationship conflict or dissolution, specifically on behalf of the person who is under benefiting (Sprechner, 2001). It appears that in the beginning of relationships, individuals are chiefly concerned with rewards in the individual areas, while people in intimate bonds are more interested with rewards evolving from the relationship (Lloyd, Cate, & Henton, 1982). In a study by Lloyd, Cate and Henton (1982), the resources of information and love were significant predictors of satisfaction in intimate relationships.

CONCLUSION

The gathering of data is still in progress but conclusions are expected to be similar to those of previous research findings, which have indicated that a high degree of SE in romantic relationships has a positive correlation with a high amount of satisfaction. It is expected that the processes and correlation between resources exchanged and relationship satisfaction will not be drastically dissimilar among Latinos, thereby closing some racial/ethnic gaps among Latinos and members of different race/ethnic groups. Future research inquiries should focus on the assessment of what is deemed as fair in the exchange of resources in social interactions between individuals in romantic relationships; specifically what types of resources can be exchanged and what cannot, and if any limitations exist among the exchange of such resources.

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THE WAR AGAINST SPAM: AN OVERVIEW OF DIFFERENT SPAM FIGHTING APPROACHES

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INTRODUCTION

Email is a convenient, fast and effective form of communication. However, the benefits of email communication are being threatened by the ever incrementing levels of spam. Spam¹ has become more than a frustration, it has become a tool to commit fraud and to spread computer viruses² and worms³. Fighting spam remains a difficult problem despite the vast amount of research done in this area. We have reached the point where spam and email accounts go hand in hand. With the implementation of every new anti-spam approach, spam senders seem to still find a way to deliver their unwanted messages to the user's inbox. This can be declared as a war in all its right.

This study overviews different technical, legislative and economical spam fighting approaches, from proposed solutions to implemented techniques. Each approach is analyzed as if it was a single method to counter spam, with the objective of independently stressing its strengths and weaknesses. These methods have been divided into two main categories: prevention (stopping spam before it is sent) and filtering (removing spam after it has been sent).

¹ Also known as unsolicited commercial email (UCE), unsolicited bulk email (UBE) and "junk mail".

² Malicious programs that need user interaction to start executing.

³ Malicious program that copies itself to other computers without the need of user interaction.

LITERATURE REVIEW

STOP SPAM BEFORE IT IS SENT: PREVENTION

Removal is the first stage in the mailing system where to target spam email. These methods attempt to prevent spam from being sent either by making the sending of spam less attractive through economical and legislative means or by blocking spam with technological methods.

The main idea behind the economical approaches is making the sending of email more expensive, to the point that sending massive amounts of mail becomes less profitable. Monetary based systems, such as charging postage for email[19], have two main difficulties: the absence of a global monetary system and the worldwide adoption of such a system. If monetary systems are implemented, the following question is still to be answered: to whom will the money go? Two interesting proposals are to implement charity seals[4] and to make a binding offer[9] to pay the receiver. The need of adopting a global coin is eliminated with the proposed ticket server service[1] that uses tickets instead of money, but the difficulty of adopting this system worldwide remains. Computational-based approaches[2,8] are based on the assumption that "time is money." The computer of the sender must perform some calculations[2] or solve some puzzles[8] before sending each email. This may induce spammers to legally form an army of spam senders by buying many machines with high processing speed to alleviate the cost and slow-down of sending email

due to computing these functions. Keep in mind that if any of these economical approaches were to be implemented, spammers may shift to other methods to get their messages across the world without suffering the extra costs to send emails. We would probably experience a huge increase in the percentage of spam zombies⁴.

Many countries have passed laws against spam⁵, but as long as there does not exist a global legislation, spammers will continue to find loopholes (such as stationing their spam-sending machines in a country that does not legally disallow it). Therefore, partial legislation will only restrict the spammers' operational base land, but will not stop them. It is crucial to mention that in the present it is difficult to correctly identify who the true spam sender is, thus even if global legislation exists, many security measures must take place before the laws can be enforced.

The following technological techniques block spam at the outgoing mail server level, before it is considered "sent." A brief explanation of when an email is considered "sent" follows[6]. The user composes a message in an email client program such as Outlook Express, Eudora or Mozilla Thunderbird, to name a few. When the user presses the "send" button, the email client program connects to a local outgoing mail server. If the outgoing mail server refuses the message, the email is not considered "sent" and the user's email client program would report an error. If the outgoing mail server accepts the message, the email client program considers the mail "sent."

The most extreme technological method to counter spam is the white list, which is a list of addresses from which mail is only accepted. Even though the white list will not let any spam reach a user's mailbox, it is impossible to receive email from any new sources. Methods such as greylisting [14] and challenge-response systems [7] attempt to distinguish automated spam sending machines from legitimate senders. Greylisting targets spammers that use spam engines that generally do not implement re-trying if a temporary failure notice

is received (as specified by RFC⁶ standards [26]). Spammers may circumvent this approach by implementing re-tries. A drawback is the possibility of a legitimate email getting classified as spam if a provider is running a non-RFC compliant version of mail server software. Challenge Response Systems send a challenge if the sender is not white listed, assuming that automated systems and emails containing fake "from" addresses (known as address spoofing) will not respond to the challenge. If widely deployed, spammers may disguise their emails as challenges to trick users into reading them. User address books may be a target of black-hat hackers⁷ wanting to obtain the white lists. Spammers may then spoof these addresses. Challenges may be sent to unwitting users whose e-mail addresses have been spoofed, increasing their junk mail.

Email address spoofing is possible due to the lack of authentication of the email system. An email address in the "from" header can be altered, inserted or deleted in any stage of the email system. Several extensions to the SMTP⁸ protocol have been proposed [3,15,23,30] to address this security issue, however none of these extensions completely solve the problem of SMTP authentication. As of June 2005, there are no RFC Internet Standards for SMTP authentication⁹. However, other authentication methods have been developed to counter email fraud and spam, such as return-path address protection[12,20,22], Microsoft's Sender ID and Yahoo!'s Domainkeys. Both Sender ID and Domainkeys must be widely deployed to be most effective.

REMOVE SPAM ONCE SENT: FILTERING

Detecting and removing spam once sent is referred to as filtering. Filtering can be roughly categorized as follows: content-based, origin-based, traffic-flow-based and signature-based. Reducing false positives (legitimate emails that get classified as spam) to zero is the most challenging problem in filtering spam. None of the filtering techniques described below achieve a zero percent false positive result.

Content-based filtering examines the content of the message, including Subject lines. Content based heuristic filters (word and scoring filters) examine

⁴ Computers that have been compromised by an attacker via a computer virus/worm and send massive amounts of spam, under the direction of the attacker.

⁵ Refer to <http://spamlinks.net/legal.htm> or <http://www.spamlaws.com>

⁶ Request for Comments (RFC) are public documents that discuss Internet protocols, procedures, and concepts.

⁷ Those who break into computer systems without authorization with intent to do damage.

⁸ Simple Mail Transfer Protocol (SMTP) specifies the rules to send and receive email.

⁹ Refer to <http://www.rfc-editor.org/>

the body of the message and compare its contents (words) to a set of rules which are used to classify an email as spam or legitimate. Word filters were quickly circumvented by spammers in that spammers purposely misspelled words[17]. Word filters yield a high false positive rate: if a legitimate email contains the word "money," it will be filtered if this word is part of the spam key word list. Scoring filters reduce the percentage of high positives compared to word filters. Each word has a different score depending on how spam-typical it is and if the total email score reaches a certain threshold, the email will be categorized as spam. However, scoring filters were easily circumvented by spammers by misspelling words [17]. Naive Bayesian (NB) filters quickly addressed the problem of misspelled words. This filter is widely used because it is very accurate and the false positive rate is very low after it has been trained [13]. NB filters adapt and learn from previous emails using a statistical analysis on the body (words and phrases) of an email to determine spam. However, spammers are incorporating regular text such as poems and short stories to circumvent NB filters [18]. Techniques such as Markovian matching[31] are being studied to increase the accuracy of NB filters. Another approach that is not widely used yet is to examine the message as a whole instead of individual words or phrases. The main assumption behind Chi by Degrees of Freedom [25] is that every author creates a textual footprint, which can be analyzed as a whole, and thus enabling the filtering of email of matching similar footprints. Spammers may purposely change their writing style to circumvent this approach. Because the content of every message must be examined, there is some processing overhead involved with content-based filters.

Origin-based filters only examine the headers of the message, specifically the "from" and "return-path". These filters are used to maintain a list of prohibited senders. Spam is sometimes sent through mail servers that are known to be operated by "spam-friendly" organizations. These mail servers can be restricted with origin-based filters by blacklisting them, for example. Organizations manually keep a black list of the addresses of prohibited senders. Black lists may generate false positives in that an address may erroneously get blacklisted. Real Time BlackHole Lists (RBL's) are similar to blacklists, but instead of manually updating the list, organizations just subscribe to them. The effectiveness of RBL's is very controversial in that some spam reports are

not fully confirmed by the RBL operator and the addresses are listed anyways, which may generate many false positives. RBL's are the target of distributed-denial-of-Service (DDoS) attacks¹⁰, which reduces their effectiveness. Some RBL's are obligated to shut down their services permanently due to the economic burden that these attacks instilled upon them[21,27].

Traffic flow filters consider the amount of times that the same message appears on the Internet. This method is also known as bulk mail detection. The two most common techniques used are Distributed Checksum Clearinghouse (DCC) and Rate Control Filtering. DCC considers an email spam if the same email appears an amount of times that reaches a certain threshold. DCC can be useless if Spam is made unique or if identical Spam messages are generated in small batches. Rate controls allow only a certain number of connections from the same address during a specified time. It is very useful to block bulk mail (that originates from the same address) that is directed to a specific email server in a short period of time.

Signature-based filters are used in combination with honeypots. Honeypots is a term used for groups of "dummy" email addresses that are made public with the sole purpose of attracting spam. The process giving a message an identifier and comparing identifiers against lists of previous identified spam is known as signature-based filtering. The main benefit of this approach is that false positives are rarely produced, but signature-based filters are fairly easy to defeat. If the spam email content is modified, the unique identification number will not match. Millions of spam messages of type A may be sent by the time a signature for A is generated[17].

METHODOLOGY

The Spam fighting approaches mentioned in this report include techniques that have been implemented as well as experimental, proposed solutions. The benefits and drawbacks of each anti-spam approach are analyzed considering each approach as a single solution to the spam problem. In some cases, different methodologies and suggestions of the same techniques are discussed. These approaches have been divided into two main categories: *prevention* (stopping Spam before it is sent) and *filtering* (removing Spam after it has been sent).

¹⁰ Zombie computers are directed to flood a particular target with multiple requests, bringing the service down.

Fighting spam is an ongoing war. Apart from joining research groups to develop spam solutions, there are several ways that an individual may contribute to the war against spam. Computer zombies are used to send spam and coordinate DDoS attacks via viruses and worms[29]. Installing antivirus software in computer systems is an essential tool to counter spam and email fraud. Identifying spam would be more efficient if the majority of spam receivers reported it. There are several organizations that spam[11,28] and Internet fraud[24] can be reported to. Email address harvesting is referred to as the different methods that spammers use to find new email addresses. For details in protecting an individual's email address from been harvested refer to [5,10].

CONCLUSIONS

Different technical, legislative and economical spam fighting approaches have been overviewed, from proposed solutions to implemented techniques. Every anti-spam approach discussed excels in different ways. A single approach was sufficient when spam was not so sophisticated. As spam evolved, it became apparent that one approach was not enough, thus a combination of the different techniques was needed. There does not exist an anti-spam approach that completely stops spam from reaching the user's inbox. It has been discussed that email address spoofing is one of the most effective methods to circumvent anti-spam techniques and to trick users to open the emails. Fake email headers are not only used by spammers as a tool to hide their tracks when sending spam, but are also used as a tool to spread computer worms and to commit fraud. The most fundamental approach needed to increase the efficiency of other anti-spam techniques is sender authentication. Authentication standards are essential in combating email fraud and spam. This is an ongoing study. The next step is to further study and develop authentication methods to increase security in the email system.

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THE USE OF STANDARDIZED COMPUTER-BASED TESTING TO DETERMINE ACADEMIC SUCCESS

BY HEATHER SHAY



INTRODUCTION/BACKGROUND

A shortage of graduate nurses is currently a nationwide problem which is escalated by limited number of student spaces in available nursing programs. Moreover, as waiting lists for admission to existing nursing programs continue to lengthen, a 'first-come first-serve' criterion, which is used by many programs, may no longer be an appropriate option for admission. This situation is currently being evaluated at the University of Nevada Las Vegas (UNLV), School of Nursing (SON).

Currently the admission requirements for the School of Nursing are as follows: grade point average greater than 3.0, completion of prerequisites with a minimum letter grade of a 'B' in selected classes, and proclamation of nursing as the student's major. Those who apply early and meet the above requirements are placed in the nursing classes and the remainders are placed on a 'waiting list'. Presently, there are approximately 500 students on the 'waiting list' to be admitted to the UNLV SON; therefore it is essential that those who are admitted will achieve the academic grades required to progress and complete our four-semester program.

Researchers in the SON at UNLV are currently evaluating the efficacy of utilizing standardized computer-based testing scores as an entrance criterion in attempt to predict first year academic success and additional ongoing standardized computer testing as

criteria for student progression to subsequent semesters.

REVIEW OF LITERATURE

A lack of specific research in nursing programs in general, and in the program specifically, suggests the need for further research utilizing standardized computerized testing to predict future academic performance, and ultimate success on the state licensure examination (NCLEX-RN). A review of literature revealed that there is limited data regarding the correlation of standardized computer-based testing, such as the Educational Resources, Inc (ERI) and Nursing Entrance Test (NET), and academic success; however available data suggest the potential for using standardized testing as an intervention to improve student success in nursing programs.

Sayles, et al (2003) report a personal communication that dates the first use of a total ERI testing plan in a nursing program to 1997. Rubino (1998) determined that the sub-scores from another computerized test, the NET, given upon admission to the nursing program were able to predict future academic success. Additionally, Barkley, Rhodes, and DuFur (1998) found that standardized test scores predicted pass rates on state licensure examinations. Other investigators (Beeson and Kessling, 2001; Briscoe and Anema, 1999; Endres, 1997; Swenty, 1998; and Wescott, 1997) utilized standardized tests other than ERI and NET to predict outcomes for their nursing students. Their

primary findings concluded that a high grade point average, success in nursing courses and above average scores on standardized tests predicted success on state licensure exams.

OBJECTIVE

The primary objective of this study was to examine the available data to determine if significant correlations exist between first-semester standardized computer-based exam scores and first semester academic success (measured as numeric class scores).

METHODOLOGY

A correlational design was used. Newly admitted nursing students were required to take two standardized computer-based exams at the beginning of their first semester. These exams included, the *Nursing Entrance Test* (NET), which evaluates seven areas essential for academic success including basic math skills, science, and reading comprehension, and *Fundamentals of Nursing*, designed by Educational Resource, Inc (ERI) which evaluates the nursing process, client needs, critical thinking process, and topics specific to fundamentals and communication in Nursing. At the conclusion of the first semester, classroom numeric grades and standardized scores were analyzed to determine if any significant corre-

lations were demonstrated. Data are currently available for three successive groups of first-semester students who were admitted in Fall 2004, Spring 2005 and Summer 2005, respectively.

RESULTS:

The sample of students (N=140) was 86.8% female; mean age 25.87 ± 7.4 years; 47.2% Caucasian, 31.0% Asian, 8.5% Hispanic, 4.9% Black, 4.9% Native Hawaiian or other Pacific Islander, 1.4% American Indian or Alaska Native, and 2.1% other; 76.6% spoke English as their first language; 73.2% were not married, 81.7% had no children, and 33.3% of the students had a grade point average (G.P.A.) between 3.00 and 3.24 out of 4.00 upon admission. One-way analysis of variance (ANOVA) indicated no significant differences in the mean G.P.A. upon admission between the three consecutive first semester nursing students (2.32 ± 1.18).

Pearson's Product Moment (r) was used to determine the correlation of standardized computer-based scores and numeric scores given for the first semester of nursing school. Significant positive correlations were found between both of the two standardized tests compared and three of four first semester class scores. These results are presented in the Table I.

Table I Correlations: First Semester Standardized Tests Composite Scores and First Semester Course Grades

		NET	ERI: Fundamentals
NURS 305 Basic Principles of Patient Centered Care	Pearson Correlation (r)	.300(**)	.472(**)
	p value	.001	.000
NURS 306 Pharmacology and Pathophysiology	Pearson Correlation (r)	.124	.305(**)
	p value	.166	.001
NURS 307 Health Assessment	Pearson Correlation (r)	.395(**)	.410(**)
	p value	.000	.000
NURS 308 Nursing in Today's World (Fundamental Concepts)	Pearson Correlation	.257(**)	.113
	p value	.004	.224

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

CONCLUSIONS

This initial data indicate that first-semester standardized computer-based testing scores were generally positively correlated with the first-semester academic scores in this sample. Research regarding the effectiveness of using standardized computer-based testing is continuing at the UNLV SON to follow four groups of students through the four semesters of the current program as well as continued follow-up of this sample's pass rate on the state licensure examination (NCLEX-RN).

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WE GET BY WITH A LITTLE HELP FROM OUR FRIENDS: EXPLORING THE EFFECTS OF COWORKER SUPPORT ON EMPLOYEE BURNOUT AND JOB ATTITUDES

BY VALERIE AVERY



INTRODUCTION

The purpose of this study is to build on and extend existing research on Perceived Organizational Support (POS). A significant amount of research by Eisenberger and colleagues (e.g., Eisenberger et al., 2001; Rhoades, Eisenberger & Armeli, 2001) indicates that POS is an influential determinant of a number of employee attitudes and behaviors. However, this paper argues that POS provides only a partial picture of support in the workplace. Specifically, coworkers are also an important source of support. Accordingly, this study examines the dual role of both POS and Perceived Coworker Support (PCS) in determining employee attitudes and turnover intentions.

Increasingly firms are changing their organizational structure. To a greater extent, companies are decentralizing and developing lateral and cross functional work teams in their organizations. Cropanzano & Schminke (2000); Guzzo (1995) and Konovsky (2000); each assert that organizations' work teams are increasing in number. Individuals interact more with their coworkers than their supervisors as a result of organizations' reliance on geographically dispersed teams and cross-functional task forces (Guzzo, 1995). This increased use of work teams further emphasizes the importance of coworker support.

Below, the considered research first reviews the existing research on Perceived Organizational Support (POS). Subsequently, the research reviewed

indicates that PCS may also be important. Based on these literature reviews, one can draw several hypotheses proposing that both PCS and POS directly impact employees' job attitudes. In addition, it is predicted that PCS and POS moderate the relationship between job-related stress and worker attitudes. The paper concludes with a discussion of the implications of our study's findings for work organizations.

LITERATURE REVIEW

ORGANIZATIONAL SUPPORT THEORY

Perceived Organizational Support. Over the past two decades, Perceived Organizational Support (POS) has increasingly received a great deal of attention. POS has been shown to have a high relationship with several aspects of employee behavior. Organizational support theory (Eisenberger, Huntington, Hutchison, & Sowa, 1986) asserts that employees establish a common belief in regards to how much their organization cares about their socioemotional and overall well-being, and to what degree their performance and loyalty to the company is rewarded. Reflected in this common belief is the assurance that aid will be available from the organization when it is needed to perform their job effectively and to deal with stressful situations (George, Reed, Ballard, Colin, & Fielding, 1993).

In addition, Rhodes, Eisenberger and Armeli (2001), point to POS as contributing to an emotional bond

formed by the employee toward the organization. Eisenberger et al. (1986) further asserts that employees attribute humanlike characteristics to their organization. For example, if an employee perceives the organization as treating them fairly, they translate this into the organization liking them on a personal level. Conversely, if they feel they have been unfairly treated, they view this as the organization disliking them. With these human-like characteristics assigned to the organization, it follows that employees would feel the need to reciprocate favorably or negatively to the organization (Blau, 1964).

POS is also credited with moderating the effect of employees' intent to quit. Rhoades et al. (2001) noted that increased POS leads to employees feeling committed and obligated to help the organization, which reduces turnover. Furthermore, the findings of Armeli et al. (1998) stated that "the organization plays an important social role in employees' lives. Satisfying socioemotional needs by the communication of respect, caring, and approval, and has the potential of markedly increasing employees' performance." It follows that when employees feel their needs are being met by the organization, job satisfaction increases, thus reducing the need to quit.

Perceived Coworker Support

Although there has been two decades of empirical studies on Perceived Organizational Support (Armeli et al., 1998; Aselage & Eisenberger 2003; Eisenberger et al., 1986; Eisenberger et al., 1990; Eisenberger et al., 1997; and Eisenberger et al., 1999), less attention has been paid to the effects of coworker support. PCS is also an important moderator of work-related stress, employee conduct and outcomes. Perceived Coworker Support is the degree to which employees feel they are supported and treated favorably by their coworkers; and provided aid when it is needed to carry out their job effectively and to deal with stressful situations.

Mohrman and Cohen (1995) have asserted that coworker interaction influences individual, as well as, group behavior. Further, they suggest that individuals working in teams must possess certain social skills, among which is helpfulness. In addition, Bishop et al. (2000) assert that an employee's perception of team support affects their commitment to the team, thereby moderating individual job performance. If an employee feels they are taking on more work than the rest of the team and/or

receiving little or no support from fellow team members, they may exhibit deviant behavior. Deviance may take the form of such behaviors as absenteeism, tardiness, work slowdown, resigning and, in severe cases, theft or aggression.

Psychological Contract Theory. Psychological Contract Theory proposes that individuals negotiated their needs via psychological contracts. As numerous studies have shown in reference to POS, this same lack of coworker support would be viewed as a psychological contract breach, which as Aselage and Eisenberger (2003) states, "leads employees to decrease their level of commitment and production. When fulfilled, the psychological contract would be expected to have positive effects on employee performance. This is because the reciprocity norm would encourage employees to fulfill their contractual obligations."

Employees who perceive support from coworkers will reciprocate by being helpful themselves, thus fostering a supportive work environment. In essence, favorable treatment generates more favorable treatment. This theory of an individual's need or obligation to reciprocate favorable treatment is supported by Eisenberger et al. (2001). George and Brief (1992) also noted previously that positive mood may prime employees to think about favorable characteristics of coworkers, leading to helpful behavior.

SOCIAL EXCHANGE THEORY

The Norm of Reciprocity. Social exchange theory denotes that consistent exposure, repeated reliance, trust and favorable treatment will result in a beneficial reciprocal relationship among coworkers. Reciprocity is a fundamental aspect of social life (Deckop, Cirka, Andersson, 2003). When one person treats another well, the reciprocity norm obliges the return of favorable treatment (Gouldner, 1960). Regarding the norm of reciprocity, Gouldner (1960) assert that a significant cause of an employee's helping behavior is how much organizational citizenship behavior (OCB) the employee has received from coworkers. Applied to coworker relationships, the reciprocity norm dictates that each employee reciprocates favorable treatment. This behavior results in mutually advantageous outcomes. For instance, coworker A staying late to help coworker B with a work project, because coworker B had previously switched days off with coworker A, so that coworker A could attend their child's school play; or an employee offering a ride home to a fellow employee who has

in the past been supportive of their ideas, are in effect, examples of reciprocity. In these instances the employees feel a sense of gratitude and responsibility toward one another; further, they each reap the rewards of the favorable treatment shown them. This environment should enhance employees' attitudes and behaviors directly. In addition, it should help them deal with work conditions and thus reduce the relationship between stress and burnout, deviance and turnover.

WORK PRESSURE AND BURNOUT

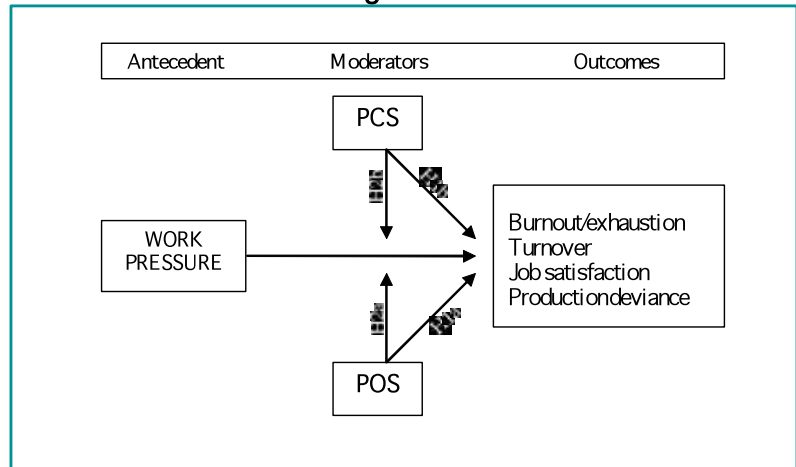
External pressure is derived from an outward source which weighs heavily on one's mental or physical state causing stress. In the case of work pressure, an employee's work-tasks, environment, relationships are all sources of work pressure. For example, deadlines, difficult bosses, dissatisfied customers or, the conforming of a project to exacting specifications, can be difficult and draining aspects of a job. Dealing with these pressures requires exerting energy, both mental and physical. If an individual is constantly facing these pressures alone this can lead to mental burnout and physical exhaustion. According to Toppinen-Tanner et al. (2002), the most often used definition of burnout, "is a severe syndrome which develops as a consequence of a prolonged stress situation at work [in addition] exhaustion is one dimension of burnout." Further, their study found that: a lack of resources and/or job demands, such as time pressure, was positively related to exhaustion. However, POS and PCS may be the resources that help employees deal with the pressure. When POS and PCS are high the employees does not have to face the pressure alone.

HYPOTHESES

Figure 1 depicts the relationships between work pressure, PCS, POS, and related outcomes. Work pressure is the independent variable, and PCS, and/or POS act as moderators to influence the effect work pressure has on the dependent variables of burnout, turnover, job satisfaction, and deviance (H2). PCS and POS also exert direct influence on these relationships (H1).

It is human nature to want to fit in or feel that you belong. People feel the need for an affiliation (Folger & Cropanzano, 1998). For example, as teenagers we form social clicks. These relationships offer a supportive and safe environment in which to deal with

Figure 1



issues and pressures that arise in high school. Support during these formative years, in the social setting of a high school, moderates the effects of these pressures on our behavior in this same setting. In addition, we feel those who are supportive of us are in fact treating us fairly. This concept is continued into adulthood, where in the social settings provided by employers, workers gravitate toward those that offer them a supportive foundation on both an emotional and professional level. The relational model of Tyler & Lind (1992) suggests that social/psychological needs are likely to be satisfied when people interact with others who are procedurally fair. Support from the individuals around us contributes to our sense of well-being and fairness. Further, when others treat us favorably we feel the need to reciprocate (Gouldner, 1960); thus, the norm of reciprocity takes effect. The continued effects of reciprocity offer security. Workers feel secure in the knowledge that others will be there to help them with work related needs. As stressed previously, PCS and POS directly affect the relationships between stress and burnout, deviance and turnover, thus we predict:

Hypothesis 1a: Perceived Organizational Support will be positively related to job satisfaction and negatively related to production deviance, burnout and turnover.

Hypothesis 1b: Perceived Coworker Support will be positively related to job satisfaction and negatively related to production deviance, burnout and turnover.

Support from coworkers affects both individual and group performance, and is fueled by the norm of reciprocity. In addition, there is an established link

between POS and how employees negotiate their relationship with the organization (Eisenberger et al., 2001). Thus, it can be said that there are two moderators: POS and PCS; each moderate the relationship between job stress burnout and attitude. Essentially, when POS and PCS are high the relationship between job stress and negative outcomes will be lower than when POS and PCS are low, indicating POS and PCS help employees deal with pressure, therefore we further predict:

Hypothesis 2a: Perceived Organizational Support moderates the negative effects of work pressure such that high perceived organizational support reduces the relationship between a high degree of work pressure and burnout, deviance and intentions to quit.

Hypothesis 2b: Perceived Coworker Support moderates the negative effects of work pressure such that high perceived coworker support reduces the relationship between a high degree of work pressure and burnout, deviance and intentions to quit.

METHODOLOGY

This research examined surveys administered to 224 employees in over forty law enforcement agencies throughout the United States. The surveys examined the employees' relationships with coworkers, supervisors and their perception of, and role in, the organization. This study focused primarily on the employee and coworker interactions. All participants were assured of anonymity.

MEASURES

The respondents were asked to measure the degree to which they agreed or disagreed with each statement as it was presented on the survey. A 7-point Likert-type scale was used, with 1= strongly agree and 7= strongly disagree. Appendix 1 illustrates the seven scales as they appeared on the survey. These surveys contained scales that related to two moderators; POS (7 items) and PCS (5 items), evaluated the antecedent: work pressure (6 items) and measured the related outcomes of burnout/exhaustion (4 items), commitment (7 items), job satisfaction (5 items) and production deviance (5 items).

Perceived Organizational Support; seven statements evaluated employees' perceptions of the support they received from their organization.

Perceived Coworker Support; five statements evaluated employees' perceptions of coworker support.

Work pressure; six statements measured the level to which the employees felt they were under a high degree of work-related pressure.

Burnout/exhaustion; four statements measured the degree to which the employees felt their jobs left them burned-out and exhausted.

Job satisfaction; five statements were included to measure the degree to which the employees felt satisfaction with their jobs.

Production deviance; five statements were selected to measure the degree to which the employees committed acts of production deviance.

RESULTS

Table 1 presents scale reliabilities, standard deviations and intercorrelations for all dependent and independent variables in the study.

TABLE 1: Means, Standard Deviations, and Intercorrelations Among Variables

Variable	Mean	s.d.	1	2	3	4	5	6
1. Job-related Stress	3.23	1.24	(.79)					
2. POS	3.98	1.24	-.26**	(.88)				
3. PCS	4.89	1.20	-.26**	.44**	(.82)			
4. Burnout	3.74	1.48	.58**	-.36**	-.35**	(.88)		
5. Job Satisfaction	5.49	1.13	-.33**	.40**	.54**	-.37**	(.78)	
6. Deviance	2.31	1.06	.16*	-.16*	-.21**	.13	-.20**	(.67)

Note: Scale reliabilities are shown in parentheses on the diagonal; **p<.01; *p<.05

Research staff tested hypotheses with a series of step-wise multiple regression analyses. In each analysis, we entered job-related stress first. Research efforts then entered PCS and POS as a block and finally, entered the PCS X Stress and PCS X POS interactions. Table 2 presents the results for deviance. As expected, Job-related stress significantly affected deviance in step 1. As shown in Table 2, the results support Hypotheses 1b and 2b. PCS exerts a significant direct affect on production deviation such that employees who believed they received more support from coworkers engaged in less deviance than did those who received less sup-

port. In addition, PCS also interacts with stress to influence the extent to which respondents engage in production deviance. However, Hypotheses 1a and 2a were not supported as there was no significant main effect or interaction effect for POS.

TABLE 2 Results of hierarchical regression analyses Job-related Stress, Deviance, PCS and POS			TABLE 3 Results of hierarchical regression analyses Job-related Stress, Burnout, PCS and POS.		
Dependent Variable:	Deviance		Dependent Variable:	Burnout	
Independent Variables	B	beta	Independent Variables	B	beta
Step 1: Job-related Stress			Step 1: Job-related Stress		
Job-related Stress		.159*	Job-related Stress	.697***	.589***
<i>F change</i>	4.99*		<i>F change</i>	109.36***	
<i>R² change</i>	.025*		<i>R² change</i>	.347***	
Step 2: POS and PCS			Step 2: POS and PCS		
POS	-.029	-.034	POS	-.262***	-.
PCS		-.169*	PCS	-.153*	-.220***
<i>F change</i>	.145*		<i>F change</i>	14.44***	-.126*
<i>R² change</i>	3.233*		<i>R² change</i>	.08***	
Step 3: Interactions			Step 3: Interactions		
Stress X PCS			Stress X PCS	-.013	-.015
Stress X POS			Stress X POS	-.018	-.021
<i>F change</i>	.082***	.128***	<i>F change</i>	.18	
<i>R² change</i>	-.100	-.175	<i>R² change</i>	.001	
<i>Total R²</i>	.07*		<i>Total R²</i>	.42	
*** = p < .001			*** = p < .001		
* = p < .05			* = p < .05		

Table 3 presents the results for burnout. The results here support the first hypothesis, but not the second. As shown in the Table, PCS added explanatory power above and beyond the effects of POS. Both PCS and POS significantly influence the extent to which employees experience burnout. However, the results did not support our second hypothesis as related to burnout, as neither PCS nor POS interacted with stress to affect burnout.

Table 5 depicts the results for respondents' intentions to remain with their agency. Both hypotheses were supported in terms of turnover intentions. As shown in the Table, the direct effects for both PCS and POS were significant. In addition, both PCS and POS interacted with job-related stress to affect employees' turnover intentions.

CONCLUSION

For over twenty years Perceived Organizational Support has received a great deal of attention, and has proven to be a concept worthy of study; however, although less attention has been paid to it over the years, the effects of Perceived Coworker Support

TABLE 4 Results of hierarchical regression analyses Job related stress, Job Satisfaction, PCS and POS			TABLE 5 Results of hierarchical regression analyses Job related stress, Turnover, PCS and POS		
Dependent Variable:	Job Satisfaction		Dependent Variable:	Turnover	
Independent Variables	B	beta	Independent Variables	B	beta
Step 1: Job-related Stress			Step 1: Job-related Stress		
Job-related Stress			Job-related Stress	.250**	.210**
<i>F change</i>	.304***	.335***	<i>F change</i>	9.07**	
<i>R² change</i>	.112***		<i>R² change</i>	.04**	
Step 2: POS and PCS			Step 2: POS and PCS		
POS	.154**		POS	.408***	-.342***
PCS		.170**	PCS	.282**	-.217**
<i>F change</i>	.398***	.426***	<i>F change</i>	28.166***	
<i>R² change</i>	.248***		<i>R² change</i>		
Step 3: Interactions			Step 3: Interactions		
Stress X PCS	-.053	-.076	Stress X PCS	.117*	.123*
Stress X POS	.077*	.121*	Stress X POS	-.168**	-.200**
<i>F change</i>	1.55		<i>F change</i>	3.60*	
<i>R² change</i>	.01		<i>R² change</i>	.03*	
<i>Total R²</i>	.37***		<i>Total R²</i>	.29***	
*** = p < .001			*** = p < .001		
** = p < .01			** = p < .01		
* = p < .05			* = p < .05		

is also important. This study hypothesized that PCS and POS would have a direct affect on the relationships between work-related stress, employee burnout and other outcomes and that PCS, above and beyond POS, would be a moderator of these relationships.

Our research indicated that for all dependent variables, PCS was important above and beyond POS. It is noted that job-related stress impacted the outcomes and as predicted in H1, and found that PCS, above POS, was positively related to job satisfaction and negatively related to production deviance, burnout and turnover. In addition, as predicted in H2, research found that PCS and job-related stress interacted to moderate deviance and that PCS, POS and job-related stress interacted to moderate turnover. However, further predictions in hypothesis 2 were not supported. Research found that PCS and job-related stress did not interact to affect burnout and job satisfaction.

In the age of newly designed business structures and an increase in team-oriented work environments, it is important that firms take note of these findings. Many firms are decentralizing their organizational structure, thereby flattening out their once hierarchal chain of command. Employees from different departments and levels of authority are working side by side. New multi- and cross-functional

work teams are being formed to handle long and short-term tasks. Given that these work teams are often required to work closely together on various projects, inevitably this will involve some degree of stress. Research has indicated work-related stress significantly affects deviant behavior of employees. Whether the deviant behavior is used as a coping mechanism or retaliation, it is counter-productive. PCS and job-related stress interacted to moderate the outcomes: deviance and turnover, and POS and PCS both directly affect their relationships.

Given these results, the degree of coworker support is an important consideration when forming work teams and to maintain productivity within these teams. Organizations can help to foster a supportive environment by providing training courses which include such topics as: interpersonal relationships, dealing with stress, and ways to assist your coworkers. In addition, they can administer personality tests when forming work teams to help reduce personality conflicts among team members. Whether forming new work teams or to increase the productivity of existing ones, further study in this area is warranted for firms to devise methods of building and maintaining work teams that function well together and to develop tools which help to facilitate coworker support.

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THE FREMEN, THE OPPRESSED OF THE IMPERIUM

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INTRODUCTION

Frank Herbert's novel *Dune*, the science fiction Nebula and Hugo Award winner of 1966, is set in a galaxy ruled by an imperialistic government. Various powers within *Dune*, including a number of ducal houses, compete to better their positions within this universe. A famous line of the leader of one such house Baron Vladimir Harkonnen describes the complex maneuvering by the players in the novel "plans within plans within plans" (16). The major object of that scheming—and the novel's most important setting—is the desert planet Arrakis which produces spice, the galaxy's most valuable and important resource.

Widely regarded as a classic, *Dune* has been the subject of a good deal of scholarly work. Most of that work has focused on three issues. First is the novel's form. Here, the most influential critic is William Touponce, who explores *Dune's* "polyphonic" qualities.¹ Second is the novel's treatment of ecological themes, which is explored by R.J. Ellis and Susan Stratton. Third and most importantly is the issue of politics in *Dune* and, specifically, the novel's treatment of Machiavellian ideas (Minowitz and Mulcahy), consumerism (Morton), or imperialism and globalization (Williams).

¹ LITERARY Critics, Ronny W. Pakerson and Paul O. Kucerea also discuss *Dune's* "polyphonic" qualities. On the novel's epic qualities literary critic Robert Cirasa.

What scholars have not yet discussed at any length is the Fremmen as people and what the effects imperialism has upon them. The oldest inhabitants of Arrakis, the Fremmen inhabit what others consider uninhabitable terrain and initially appear to be mere pawns in the intergalactic universe. Yet the Fremmen play a crucial, if unrecognized, part in the Imperium's economy because they function as caretakers of the sandworms, who, in turn, produce spice.

LITERATURE REVIEW

Literary critic Kevin Williams defines "imperialism" as the policy of extended rule and/or influence over another country or entity (including a nation's own people) via political, military or other means (1). This definition certainly applies to the Imperium's treatment of the Fremmen; the Imperium's ducal houses rule these peoples by force in order to mine the precious resources of their planet. However, the Fremmen creates unique problems for the Imperium because of the unity they achieve through their mythos and culture. *Dune* investigates how the Fremmen overthrow the Imperium, deliver themselves from oppressive bonds, and gain control of Arrakis under the leadership of Paul Atrides. The leader of one of the ducal houses, Paul Atrides is also accepted by the Fremmen and seen as Lisan al-Gaib, or "the voice from the outer world" whom prophecies depict as their savior (Herbert, *Dune* 97). The novel ends with the prediction that the Fremmen will soon unleash jihad on the entire empire (482).

Unfortunately however, real freedom eludes the Fremen; they are so used to being oppressed that they cannot exist without strong outside leadership. Via the Fremen, Herbert suggests on the one hand, that empires forge the weapons of their own destruction by unifying peoples they subjugate and, on the other that these peoples sometimes remain subjugated even when they seem to achieve liberation.

The spice trade in *Dune* contributes to the Imperium's attitudes towards the Fremen and explains why it subjugates them. Timothy Morton depicts the commodity, spice, as paramount to the economic development of the intergalactic universe, terming it a "metastasized commodity" (3-4). Indeed, it is this disease-like spreading quality of spice that has made the Imperium absolutely dependent upon this substance and insured its profitability. The other goods that the Imperium's corporation, CHOAM, trades such as logs, donkeys, horses, cows, lumber, as are not as profitable as spice. (Herbert 43). The spice or melange is the addictive commodity that enthralles all. It increases a human's lifespan (Herbert, *Dune* 523). The Mentats or the human computers, use spice, sapho, to increase their calculating abilities (Herbert, *Dune* 528). The Bene Gesserits use a spice-based product, "Waters of Life," to gain access to their ancestral memories. (Herbert, *Dune* 532). Once changed by a Bene Gesserit Reverend Mother into a narcotic-like drug called the "Waters of Life" spice is used in Fremen rituals. Paul Atreides uses it to gain visions (Herbert, *Dune* 193). Thus, spice creates a nexus and conflict between all the different peoples in the intergalactic universe who depend upon it.

There exists a historical link between the spice trade and the evolution of the Fremen people. Fremen's history reveals that they originally inhabited a paradise, Poritrin. Their history states that they had become "soft with an easy planet" and thus an easy target for raiders through which the Imperium harvested and planted human colonies "on Bela Tegeuse and Salusa Secundus" (Herbert, *Dune* 358). A people who once lived in the comfort of a water-filled world were forced to acclimate to Arrakis. They were treated as a conquered people, a prize, and forced to live where humans could not normally survive—the "funeral plains" of Arrakis (Herbert *Dune* 30).

Once there, the Fremen endured centuries of mistreatment at the hands of imperial officials. One such official the Baron Valdimir Harkonnen states,

"The Fremen aren't worth considering" (Herbert, *Dune* 238) a statement he backs up by never bothering to investigate just how many Fremen actually inhabit the planet. The Imperium never interferes to defend the Fremen against House Harkonnen. Instead, the Imperium condones the mistreatment of Arrakis's people if it contributes to spice mining. Indeed, the Fremen are hunted for sport by the Harkonnen and are generally viewed as less than human (Herbert, *Dune* 45). The business men that deal with House Harkonnen learn to detest the Fremen as well. At one point a banker describes them as Fremen "scum" who drink the blood of their dead (137). Rather than understand Fremen culture, the Harkonnens planted seeds of hate towards them, ultimately offering a reward of a million solaris to anyone who kills a Fremen and brings proof of the deed (Herbert, *Dune* 40). Summing up the role assigned the Fremen by the Imperium the Imperial Majesty's Planetologist explains "Arrakis is a one-crop planet, One crop. It supports the ruling class that lives as ruling classes have lived in all times while, beneath them, a semi-human mass of semislaves exists on the leavings. It is this mass and leavings that occupy out attention. These are far more valuable than had ever been suspected" (Herbert, *Dune* 275).

The Imperium never recognizes the true value of this conquered people because it sees spice as the only valuable resource on the planet. The knowledge that the spiceworms create spice and that the Fremen cultivate the spiceworms eludes everyone except the planetologists (Herbert, *Dune* 499). To everyone else, the Fremen appears as merely a convenient labor force to be persuaded or forced to mine for CHOAM.

In reaction to their oppression, the Fremen have self-segregated their population into tribes and developed complicated rituals that ensure their survival and unity. Essentially, no true individuality exists in the tribe. Any person joining the group must give the rights to the water from his or her body (Herbert *Dune* 226) and now belongs to the tribe. The phrase that best describes the Fremen is a saying of the Arakneen people: "Polish comes from the cities, wisdom from the desert" (Herbert, *Dune* 38). The Arakneens see the Fremen as wise because of how well they have survived in the desert due to their tribalism. This is their strength because every member of the tribe is committed to its survival. This unifies them and they act as a group consciousness. When individual Fremen talk about who they

are, even when separate from the seitch in which they live, they use the collective pronoun “we” (Herbert, *Dune* 280). A spice-based drug taken by all during periodic tribal rituals even gives the Fremen the ability to know each others’ thoughts, binding the tribe even closer together (Herbert, *Dune* 360). Thus, group consciousness dominates the culture, leaving no room for individualism.

Survival for the Fremen depends not only on how well they work together, but also on how well they use their resources. Through them as Stratton states, “Herbert demonstrates how important and surprising the connections among things in an ecosystem can be” (307). The Fremen need for water is ensured by the fact that they inhabit a desert biome. Water thrift is of the utmost importance to their survival. To that end, the Fremen have developed stillsuits. These garments function to recycle the body’s water, which “circulates to catchpockets from which you draw it through a tube on the neck” (Herbert, *Dune* 109). However, the Fremen reclaim water not only from their own bodies, but also from the bodies of the dead (Herbert, *Dune* 131). Furthermore, the Fremen believe that “too much water leads a person to carelessness” (Herbert, *Dune* 131). This is after all what they believe happened to them on Poritine. The Fremen think people who have too many resources do not know how to manage them and they consider the water-soft people weak (Herbert, *Dune* 358).

Prizing strength, the Fremen are a militaristic people who tellingly identify their members by a weapon, the crysknife or “a maker” (Herbert *Dune* 54). As children, the Fremen compose poems to their knives (Herbert, *Dune* 39). Additionally, the Fremen test the physical strength of their members in order to choose their leaders; they believe the strongest leaders bring the tribe water and security (Herbert, *Dune* 290). The people demonstrate military-like discipline through their “fanatic loyalty” to their leader whom they follow without question (Herbert, *Dune* 126).

As a military culture, the Fremen know the value of secrecy. They have used spice to pay the Guild not to track their whereabouts through the satellite system (Herbert, *Dune* 191). Additionally, they do not allow anyone who sees a crysknife to leave the planet of Arrakis for fear such a person would expose the culture’s secrets. As the Fremen leader Stilgar states, “[Crysknives] are ours, they never are

allowed to leave Arrakis without our consent” (Herbert, *Dune* 92). Secrecy allows this culture to persevere and grow strong with military might.

The Fremen are knowledgeable about their environment and respect and learned from all the creatures who inhabited it. As a result, the Fremen even learn to harness the power of Arrakis’s most destructive force—the sandworms. Fremen ride the sandworms, they use maker hooks, and the whole tribe climbs onto the worm’s back (Herbert, *Dune* 391). With the help of the worm, they commute to the deep deserts of Arrakis. Additionally, Fremen also know how the worms produce spice whereas the Imperium views the worms as merely a destructive force that inhibits spice mining (Herbert, *Dune* 89). *Dune* demonstrates a natural worship approach to living life on Arrakis. Literary critic, Timothy O’Reilly describes the reverence this people have for the sandworm. “The Fremen know the importance of the sandworm in maintaining conditions of their life—sand, spice, oxygen—and they call him shai-hulud, or ‘maker’” (79). The Fremen cultivate spice-worms in order to preserve their seitches and exist with them in ecological balance. Thus, they treat the spiceworms as part of the tribe. Through the Fremen, *Dune* champions a natural worship approach to living.

Ironically, the Imperium ensured its own downfall by being concerned only with profits and not with the welfare of the lands and people it governs. The Fremen despise the Imperium because of their subjugation. One way, *Dune* suggests a people can be unified is through their hatred of a common enemy. The Fremen share a long history of suffering, beginning with the way they were taken from their home world and placed on Arraki, (Herbert *Dune* 358). The “spirit of suffering” is a powerful force that unifies the Fremen (Herbert, *Dune* 450). To ensure the Fremen remember where they come from they ingest “The Waters of Life” and together explore shared memories, including all the horrors they were forced to endure at the hands of their oppressors. A voice from the past urges them, “Never to forgive! Never to forget!” (Herbert, *Dune* 359). As a reaction to their ill treatment the Fremen become a thorn in the side of the Imperium, a renegade people who rebel against the feudal system by living outside the cities controlled by the ducal houses and raiding Imperium villages (Herbert, *Dune* 78, 51).

However, the Fremen gain unity and strength not only from their shared memories of past suffering, but also from their shared dream of one day turning Arrakis into a utopia. The planetologist Kynes has sold the Fremen this dream of turning Arrakis into a water planet (Herbert *Dune* 496). The original plan which Kynes proposed would take “three hundred to five hundred years” to accomplish (Herbert *Dune* 496), required the Fremen to save large quantities of water and to start using plant life to effect change slowly in order to preserve the spice worms (Herbert *Dune* 273).

Additionally, the Fremen are unified and strengthened by their beliefs, especially the Lisan al Gaib, the child of a Bene Gesserit, prophesied “to lead them to freedom” (Herbert *Dune* 101). The Fremen view Paul Atreides as that prophet because he and his family share the tribe’s “most precious dreams” for Arrakis (Herbert, *Dune* 130), just as the legend predicts the Lisan al Gaib will. Paul confirms to Kynes that he will enable the Fremen to pursue their desires, avowing “I can make a paradise of Arrakis with the wave of my hand. This is the coin I offer” (Herbert, *Dune* 224). To the Fremen, Paul is the leader necessary to bring their dream into fruition. Indeed, the Lisan al-Gaib gives the Fremen peoples the motivation necessary to change their destiny much more quickly than they have ever imagined possible.

Ironically, the legend of the Lisan al-Gaib, which “follows the familiar messiah pattern” was organically planted by outsiders, the Bene Gesserit Sisterhood to manipulate the Fremen and protect themselves (Herbert, *Dune* 101). Unfortunately for them, however, Paul uses the legend to join and unite the Fremen (Herbert *Dune* 105, 383). Though the Bene Gesserits thus originally the legend to benefit them, the legend takes on a life of its own and becomes a source of strength to the Fremen.

Paul gains the Fremen’s respect, however, because unlike the Harkonnens, he and his family—the Atreides—recognize the wisdom and value of the Fremen. Paul thinks, “What a people to win as allies” (Herbert, *Dune* 39). House Atreides sees the Fremen as a powerful force and wishes to use this “desert power” to protect themselves from House Harkonnen (Herbert, *Dune* 204). Duke Leto forges an alliance by emphasizing Fremen mistreatment at the hands of House Harkonnen; this fuels the hatred of the Fremen toward their former oppressors. Duke Leto tells his men, “The Harkonnens sneered at the

Fremen, hunted them for sport, never even bothered to count them” (Herbert *Dune* 45). He fosters understanding between the Fremen people and House Atreides over their mutual enemy.

Duke Leto gains the support of the Fremen by using other tactics as well. To both demonstrate his good will toward, and respect for the Fremen, and to learn more about them (as the Harkonnens never bothered to do), Duke Leto sends an adept diplomat to infiltrate the Fremen tribes, “a proud and ruthless,” but honest man whom he suspects “the Fremen will admire” (Herbert 37). Duke Leto hopes to prove that House Atreides are compassionate rulers who understand the Fremen cause. The Fremen willingly follow Duke Leto because he possesses the same fighting ethos as the Fremen people as he demonstrates to them through the way his military men are trained to fight Harkonnens (Herbert *Dune* 224, 93). As the tribal leader Stilager says to the Duke, “You fight well and you did the best for our friend” (Herbert, *Dune* 93). The Fremen admire leaders who give their life for their tribe or their men. They take this as a sign of bravery and loyalty. Thus, Duke Leto acquires extra military strength for House Atreides by gaining the respect of the Fremen.

The successful, triumphant symbiosis of House Atreides and the Fremen people is made possible because of the strengths the Fremen develop as a result of their difficult life on Arrakis. The Fremen traits fostered by their oppression enable the Fremen to persevere and undermine the power of their oppressors. The Fremen peoples’ militaristic life style turned them into a hardy opponent. Their understanding of nature allowed the Fremen people to harness its power. The Fremen’s unity through faith and suffering made them truly an undefeatable force against the Imperium. These traits gave the Fremen an uncompromising strength which leads to their victory. Yet, the Fremen strength becomes all-powerful only when Paul teaches the Fremen people to harness the power of the sandworms for catastrophe when he tells them, “He who can destroy a thing has real control over it” (Herbert, *Dune* 446). If the Fremen destroy the sandworms, they destroy the entire intergalactic economy and CHOAM. Through Paul, the Fremen win because his threat causes the Emperor to concede to defeat (Herbert, *Dune* 476). The Fremen are now the overlords of Arrakis.

However, the Fremen are not as free or as dominant as they seem. Real control eludes the Fremen people

because of their reliance on others. The Fremen are malleable because of their emotional suffering; they lack the ability to reason through a situation. Duke Leto teaches Paul to control the Fremen by preying on their emotions, telling him to “play on certain knowledge of their superiority, the mystique of secret covenant, the esprit of shared suffering” (Herbert, *Dune* 45). Furthermore, the Fremen want absolutes and clear answers and ultimately unwilling to discover them for themselves. They wait until their messiah comes before taking any direct or immediate action (Herbert *Dune*, 101). While religion unites the Fremen tribes, it also makes it easy for Paul to establish the new House Atreides rule over them. As literary critic Paul Kucera states, “the Lisan al-Gaib is supposed to be a liberating/empowering figure for [the Fremen], yet that liberation entails an inescapable servitude to the ‘liberating’ figure, and thus the ‘liberating’ discourse the figure speaks” (8). The Fremen do not know how to deal with true liberation, so they become slaves to House Atreides. They are deceived into thinking that they are free because of what Paul tells them. Indeed, the Fremen ultimately give power over to the new Atreides Empire rather than assuming control of Arrakis for themselves. The Fremen never came up with their own plans about how to take over the Imperium and they gave away all of their decision-making powers. This is the Fremen’s fatal flaw: they cannot think for themselves but rather remain reliant upon others. As Touponce notes “personal observation had convinced Herbert that in the power arena of politics/economics and in their logical consequence, war, people tend to give over every decision-making capacity to any leader who could wrap themselves in the myth of society” (12).

Hence the Fremen’s need for their messiah Paul to shorten the way to their desires. This gives the Fremen instant gratification without their needing to think about how a better governing system might be established for their benefit. All their reliance on mythos has left them without the ability to reason for themselves; rather their faith has taught them to seek outside leadership as a way to solve their problems. They seek to change the face of Arrakis, but are oblivious to the changes that must occur within their own society. Thus, their actions result in a quasi-freedom because they are clueless about how their oppression has affected their modus operandi.

Kevin Williams argues that Herbert’s *Dune* suggests, “that imperialism can be overcome by the cultivation of an emancipated populace that has little need for a hierarchical leadership, only an enlightened leadership” (2). However, it is an enlightened and educated leadership that ultimately dominates the Fremen. Thus, Herbert seems to disagree with Williams. Herbert believes that people act together in a group consciousness, a species-organism and uses his Fremen as the exemplar. Humanity displays what Nietzsche termed “herd behavior,” in which humankind can be easily swayed into following leaders who appear to be geniuses, but who may hide madness behind their methods. In the essay “Listening to the Left Hand,” Herbert writes that, “Process and the species-organism represent a complex mixture whose entire matrix can be twisted into new shapes by genius (Einstein) or madness (Hitler). The course of this process can be misread by an entire species despite wide evidence of disaster” (97). According to Herbert, enlightened leaders have a remarkable ability to twist the truth to gain absolute control. A populace follows the leader’s plan without considering whether that plan is immoral or wrong. The populace could be led off a cliff and not see its own doom until it becomes too late. Enlightened leadership takes advantage over others’ ignorance and lack of discernment.

Varying solutions exist. The raising of a group’s consciousness to solve its own problems may be a viable solution. The Fremen have learned to be dependent upon outsiders to give them unity—the Bene Gesserit Sisterhood and Paul Atreides, the Lisan al-Gaib. They mastered the most fearsome creature of the desert, the sandworm. Yet, the Fremen ultimately prefer to let others think for them. Through them, *Dune* seems to suggest that true solutions come from rational deliberations of the community as a whole rather than the commands or prescriptions of leaders.

CONCLUSION

Dune illustrates why a people’s history should not be forgotten. In the Fremen’s case it is the clue to understanding their culture and their reliance on leaders. They recognize and resent their degradation at the hands of House Harkonnen however, they accept House Atreides rule after subscribing to their propaganda. The Fremen cannot conceive on their own how to set up a governing system rather they wait for deliverance from their messiah, Paul Atreides. Herbert wrote *Dune* to raise the reader’s

consciousness, to encourage people to ask questions about their own leaders and the way they are chosen and followed. He advocated the political and economic education of people, so their choices of leaders would not end in disaster. The Fremen should have realized that they are a mammoth force and that, through unity, they could overcome all their obstacles. However, the Fremen remain enslaved because they let their beliefs and leaders control them. Ultimately, the Fremen allow themselves to be managed by others because they have forgotten how to manage themselves.

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RECLAIMING PARADISE: THE QUEST FOR EDEN IN ENVIRONMENTAL LITERATURE

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"Revelation comes in two volumes—the Bible and nature."
— Saint Thomas Aquinas, 13th Century

INTRODUCTION

Since the early years of Western civilization, humans have found that the natural world has served as a stage where individuals can find evidence of the existence of supernatural powers. In Christianity, nature—as the Creation—serves not only as proof of God's creative genius, but also as a conduit for better understanding God's ways (Kellert and Farnham 2002). In particular, the Garden of Eden myth is representative of how humans perceive the innocence and purity in unspoiled nature, where all animals lived in peace: "The Garden of Eden was a place and age of bliss and a place and age of God" (Sandelands 2005: 30). In this way, Eden as a place of God is similar to Eden being a sanctuary or refuge for all living beings. In order to return to this sanctuary and innocence, humans must seek out their own Eden in modern society. The idea that Eden represents paradise and that God is directly involved in this paradise is one that has remained in modern society through culture and literature.

The idea that untouched nature equals innocence has its origin in the Judeo-Christian tradition in the book of Genesis and the story of the Garden of Eden. Humans and animals were living together in harmony and God proclaimed his work "good." This value judgment lends ultimate credence to the ideal

that untouched, harmonious nature is something that should be sought and desired. The Garden of Eden represents a purity of existence for all of life, as it is the ultimate gift from God. Although humans had been given "dominion" over the beasts, there is also a tradition of stewardship, according to some biblical scholars (DeWitt 2002). Certainly, Adam and Eve lived in a state of grace, and as such, were arguably closer to God. Eden had not been compromised by human hands and remained immaculate until the exile of Adam and Eve.

The banishment from Eden has had a profound influence on humankind's views of nature. Prior to the expulsion from Eden, "Adam and Eve were living under a protective shield of innocence of a world in which everything was 'good,' or in a world in which there was no evil" (Hankiss 2001: 99). This equation of human freedom from sin and the Garden of Eden is powerfully symbolic as it places the highest moral value on undeveloped nature. According to Webster's dictionary, wilderness is "an uncultivated region," suggesting that it is free from humans. In this sense, wilderness is the modern day equivalent of Eden. God is inseparable from Eden, which inherently equals peace and harmony of all life forms except for humans, as we were banished from this paradise long time. This association brings forth the pain of something that was lost and now should be sought after by all. Eden represents a bridge between man and God. In order to return to

a state of grace and salvation, humans must seek out their own Eden and atone for the sins that occurred that led to their exile.

Environmentalists have sought out their own version of Eden in modern times. This intrinsic urge to redeem past wrongdoings is a strong base in the environmental movement. One aspect of the environmental movement that can be used to trace changing social ideals and values is nature writing. James McClintock's view of the duality between nature and religion translates into the field of nature writing, "Nature writing in America has always been religious or quasi-religious. All the important studies on the subgenre conclude that nature writing is 'in the end concerned not only with the fact but with fundamental spiritual and aesthetic truth'" (McClintock 1994: 69). Annie Dillard's *Pilgrim at Tinker Creek*, Edward Abbey's *Monkey Wrench Gang*, and Norman Maclean's *A River Runs Through It* were published over the span of three years in the mid-1970's. Each of these texts represented a cultural snapshot of the environmental movement at the time, as well as showing how each main character seeks out a spiritual truth in nature by finding their own Eden within the elements of their local environment.

PILGRIM AT TINKER CREEK

The narrator in *Pilgrim at Tinker Creek*, the author Annie Dillard, has not found her Eden yet. The entire book is a search for Eden: "God has not absconded but spread" (Dillard 1974: 7). This simple sentence summarizes the mentality of the narrator. She does not believe that the separation between humans and nature from the Fall of Man is permanent. By stating that God has not left Earth but has merely extended, she is saying that grace and salvation can still be achieved, as God will allow her the opportunity to cleanse herself of this great sin. She believes that God has placed multiple Edens throughout the world and it is her goal to find Him through the nature she is observing, "Beauty and grace are performed whether or not we will or sense them. The least we can do is try to be there" (Dillard 1974: 8). Dillard is stating that a power greater than humans is at work and we should seek this power, wherever it may be: "All of Dillard's work reveals her desire to use a retreat to explore her spiritual issues. Investigating the nonhuman world is for Dillard a religious experience, a way for her to communicate with God" (Scheese 1996: 120). So sets out the agnostic narrator into the wilderness not only to find Eden, but to resolve her own questions about

God and nature. She seeks God, and ultimately is amazed and humbled once she realizes the power of God through nature.

Dillard's novel innately blends science into her description of nature. She initially gathers information at Tinker Creek to be later sorted out and analyzed. As an explorer, her main goal was to discover the meaning of life. "Dillard wanted to get below and around human perceptual limitations. She would have liked to see God in the face if she could do so without dying" (Tietjen 1998: 102). In her quest to see God in the face, she returns to the location where humans were closest to God. Eden represented a bridge between man and God; it is fitting for Dillard to use Tinker Creek as her bridge with the hopes of seeing God in the face, thereby equating holiness with wilderness. The creek is a conduit between two worlds. In the beginning of the book, it offers Dillard a glimpse of the nonhuman world while also allowing her to partake in its beauty. Dillard sees in Tinker Creek everything the world has to offer.

Dillard's Tinker Creek is never static, but always evolving into some other form. She specifically selects Tinker Creek as a location of observation but also as a haven: "I am prying into secrets again, and taking my chances. I might see anything happen; I might see nothing but light on the water. I walk home exhilarated or becalmed, but always changed, alive" (Dillard 1974: 184). This feeling from nature is one similar to being found in a sanctuary. She always felt alive at Tinker Creek and left with a better understanding of her place in the world. As she views the ever-moving world at Tinker Creek, she realizes that nature will continue and that man cannot control it. This observation supports the notion that nature serves as the closest relation to God. Man cannot control God, nor can he control nature. Dillard recognizes this very early in the book, paving the way for a communion of sorts at Tinker Creek.

When one has found sanctuary and peace in a religion, the ultimate act of submission and surrender is communion. It allows the contrite sinner a road to cleansing his or her soul, similar to how water is used during a baptism. Water symbolizes the great equalizer in nature. It subsists between land and air, with the power to alter and wash anything it encounters. It is nature's form of baptism and communion: "The creek takes in the sum of the human experience and returns it by a sort of sacramental healing process" (McConahay 1985: 107). Dillard

finds God at Tinker Creek: "The creek is the One Great Giver. It is, by definition, Christmas, the incarnation" (Dillard 1974: 102). She found sanctuary at the creek and repeatedly returns to it, humbled by its beauty and power.

The quest for Eden is over at the end of *Pilgrim at Tinker Creek*. Dillard the agnostic has not necessarily found the definition for what God means, but she has found God in nature: "If you look up the creek in any weather, your spirit fill, and you are saying, with an exulting rise of the lungs, 'Here it comes!'" (Dillard 1974: 100). She has discovered her Eden and that God exists in every form of it. This revelation is summed up at the end of the book, while Dillard walks in a tributary to Tinker Creek, "I go my way, and my left foot says 'Glory,' and my right foot says 'Amen': in and out of Shadow Creek, upstream and down, exultant, in a daze, dancing, to the twin silver trumpets of praise" (Dillard 1974: 271). Her quest is personal, as is her reaction to finding God. Her quest began as a passive observation, but develops into a very active reverence for God in nature.

THE MONKEY WRENCH GANG

While Dillard approached nature as an agnostic, Hayduke has already found and lost his Eden in the American Southwest. The desert landscape of the Southwest is glorified in many of author Edward Abbey's novels, including *The Monkey Wrench Gang*. Abbey's extension of himself, in the character of Hayduke, also holds strong beliefs concerning the intrinsic beauty of the Southwest. This passionate reverence for the desert led to intense feelings about the commercialization of the landscape, which is what Hayduke returns to after the war: "he returned to the American Southwest he had been remembering only to find it no longer what he remembered, no longer the clear and classical desert, the pellucid sky he roamed in dreams. Someone or something was changing things" (Abbey 2000: 16). So begins Hayduke's quest for the return of his Eden, which will be restored through violence and sabotage towards those responsible for developing the Southwest into a tourist destination.

Tourism in the Southwest was booming and the construction of dams was the bane of Hayduke's existence. The Glen Canyon Dam, in Abbey's view, "killed a living river and sounded the death knell for the entire Southwest" (Casuto 2001: 77). Hayduke is not searching for God or for Eden. He had found it

prior to fighting in Vietnam. Once he returns, however, he quickly denounces what he considers to be sacrilege: the destruction of the Southwest for economic gain. Unlike Dillard, Hayduke is not on a quest to discover Eden. Instead, Eden needs to be saved from humankind's inevitable attempt at destroying it yet again: "toward the high country, the good country, God's country, Hayduke's country, by God. And it better stay that way. Or by God there'll be trouble" (Abbey 2000: 18). He fights his own battle; he fights against those who have defiled his sanctuary. With this mentality, Hayduke becomes a martyr and is willing to stop at nothing to protect what he believes is a sanctuary.

Hayduke's belief that nature is a refuge very closely relates to the Garden of Eden myth. Edward Abbey was reluctant to reveal himself as a religious man, but it seemed even he could not separate nature and God. This is evident as Wendell Berry quotes Edward Abbey: "It seems clear at last that our love for the natural world—Nature—is the only means by which we can requite God's obvious love for it!" (Berry 1994: 25). This quotation of Abbey offers insight to the mindset of Hayduke. Hayduke's love of nature goes beyond the aesthetic beauty found in the desert landscape. Hayduke's personal dilemma with the industrialization of the Southwest is because humans are destroying creation by continuing to build dams and bridges and pave roads. Understanding this origin of thought allows one to realize why Hayduke permits the destruction of dams in his sanctuary. While he might be destroying the landscape by monkey-wrenching the plans of the construction company, more importantly he is returning the land to the way God originally intended it.

During the course of the novel, Hayduke comes to the realization that he must change the path society is headed: "Hayduke thought. Finally the idea arrived. He said, 'My job is to save the ... wilderness. I don't know anything else worth saving'" (Abbey 2000: 211). Hayduke's time in Vietnam prepared him for his most important battle yet. He has taken it upon himself to cleanse the society of its wrongdoings. While Dillard's agnostic sought out a personal sanctuary at Tinker Creek, Hayduke must physically correct the errors of man. While the paths are greatly different, the end goal is the same.

Hayduke, on his quest to restore Eden, is attempting to right the past and present wrongs of human-

kind. He approaches seeing the newly dammed, from his perspective “damned,” Colorado River for the first time the same way one would approach a funeral: “The first thing they noticed was that the river was no longer there. Someone had removed the Colorado River...Instead of a river he looked down on a motionless body of murky green effluent, dead, stagnant, dull, a scum of oil floating on the surface” (Abbey 2000: 120). The ultimate sacrilege has occurred. Not only did they destroy his Eden, they destroyed God’s creation. This recognition of his Eden lost is what finally drives Hayduke to desperate measures. He realizes that he must fight to avenge God’s land and, ultimately, God himself. Hayduke is not searching for Eden, like Dillard is in her quest. As Hayduke triumphs in a small battle against a construction company, others may realize the spiritual rewards at stake for him: “They listened to the diminishing noise of its wheels, the gradual return of peace and stillness, harmony and joy” (Abbey 2000: 128). He is attempting to return to what nature once was, in order to become unified with God and atone for the ultimate sin that has been committed.

The book ends with Hayduke not only prevailing, but also reclaiming Eden. Hayduke’s “death” in *Monkey Wrench Gang* is Christ-like in terms of his own resurrection. Hayduke is presumed dead and is thought to be a martyr for a cause that is no longer being fought. With the help of Jack Burns, Hayduke reemerges having metamorphosed into a pure force of nature. He now has a job in the vicinity of the Glen Canyon Dam, “with every intention of fulfilling the gang’s mission” (Casuto 2001: 95). Just as Dillard provided a blueprint for seeking out solace and redemption in nature, Abbey describes his theory of how humankind can return to Eden through the physical liberation of nature.

A RIVER RUNS THROUGH IT

The first sentence in Norman Maclean’s story of a Scottish family of fly fishermen is appropriate for setting the tone of the novel: “In our family, there was no clear line between religion and fly fishing” (Maclean 2001: 1). This sentence offers an insight into the mind of the narrator and his brother for the duration of the novel. They have been raised to view fishing as a form of exulting God, with their teacher in both fly fishing and religion their father, a Presbyterian minister. “It explores the meaning of nature to a family living in Montana and respecting the world of God in their daily ritual of fly fishing” (Sultanik 2003: 219). Paul and his brother have found

Eden in a place that is theirs alone. They have located a setting where nothing else matters, similar to one’s perspective that God is more important than any other aspect of life: “One great thing about fly fishing is that after a while nothing exists of the world but thoughts about fly fishing...Then he steadied himself and began to cast and the whole world turned to water” (Maclean 2001: 18). They became consumed by fishing, similar to how one becomes consumed by God and the quest for salvation. Their quest is an on-going dedication to praise God through their respect for His natural surroundings, namely the river in which the family fishes.

The Fall of Man influences the way in which the family devotes their life to God. The narrator’s father admits that “man by nature is a damn mess,” yet through practice and mastery of a four-count rhythm, an aesthetic as well as spiritual ballast is attained (Sultanik 2003: 220). The brothers and father believe that the way in which spiritual enlightenment is achieved is through fly fishing: “he certainly believed God could count and that only by picking up God’s rhythms were we able to regain power and beauty” (Maclean 2001: 2). They view the ability to learn nature through fly fishing as understanding God’s power and knowledge, and therefore becoming closer to God. As it was with the other two selections, nature is the canvas for which holy clarification can be reached.

Paul and his brother use nature as a setting for their quest to be closest to God. This idea of nature and God being inseparable comes directly from their father: “My father was very sure about certain matters pertaining to the universe. To him, all good things—trout as well as eternal salvation—come by grace and grace comes by art and art does not come easy” (Maclean 2001: 4). Throughout the novel, the narrator and his father both refer to Paul as a beautiful artist. This is the highest praise that can be bestowed upon him, as it describes a life-long struggle and triumph in glorifying God. Near the end of the novel, Paul essentially achieves perfection in his fly fishing form, much to the delight and admiration of his brother and father. Paul’s salvation for his personal issues came when he was fishing. After being locked up in jail the night before, Paul is taken fishing by his brother. It is this act that most resembles attending church in order to expurgate one’s sinful ways. In this way, the river acts as a cleanser of Paul’s soul, much like Tinker Creek acted as a means for which baptism could occur for Dillard.

Fishing for the Scottish family was comparable to attending church in the greatest cathedral imaginable. The symbolism when the brothers cross the Continental Divide is incredibly profound. The narrator refers to the Continental Divide as “the divide between our two worlds” (Maclean 2001: 15). As they cross the divide, they know they are entering a world in which there is a power much greater than either of them can ever imagine: “As usual, especially if it were early in the morning, we sat silently respectful until we passed the big Divide” (Maclean 14). The attitude towards entering the realm in which they will fish is the same as entering a refuge that is free from the distractions of the outside world. They sit silently, as if absorbing a sermon on a Sunday morning, while gazing upon their own Eden.

Similar to Hayduke, there are rules and limitations to glorifying God in their place of sanctuary. Hayduke became enraged when someone disrespected and defiled his place of peace and innocence. The brothers also had rules that they made sure they never broke while they were in the process of fly fishing. When they take their brother-in-law fishing, he commits the ultimate form of sacrilege during their trip: “He had violated everything that our father had taught us about fishing by bringing a whore and a coffee can of worms but not a rod” (Maclean 2001: 79). This lack of respect for their beliefs defies all the rules they had been raised to obey. These rules and rituals for which their father instilled in them at a very young age provide each of the brothers with a path towards righteousness. If one did not obey these rules and rituals, it was sacrilege for them to attempt to fish in God’s holy land: “Nobody who did not know how to fish would be allowed to disgrace a fish by catching him” (Maclean 2001: 3). In the eyes of the family, fish were equal to humans and should be approached with the same respect. The family had found their Eden in the river, as evident by the utmost respect given to all forms of life, especially fish. There was no separation between humans and animals, which took place after the banishment of Adam and Eve. The river was their place in which they found peace, harmony and equality among all living creatures. It was their Eden.

Paul’s mastery of fly fishing not only leads to the respect of both his brother and father, but also to salvation. Whatever happens on the water—in the

house of God—is more important than what happens in Paul’s personal life. After he dies, Paul is remembered for who he was on the water and not for whom he was in the world off the water. “There is a certain poetry to Paul’s dying at the height of his artistic powers—like some incredible butterfly who expires at its moment of majesty” (Weinberger 1997: 283). Paul achieves perfection on the water and that is all that matters to both his father and brother. As the narrator and his father are watching Paul fish for the last time, his father realizes that Paul has come to a richer understanding of the river: “In the [book] I was reading it says the Word was in the beginning, and that’s right. I used to think that water was first, but if you listen carefully you will hear that the words are underneath the water...The water runs over the words. Paul will tell you the same thing” (Maclean 96). Paul has, in this instance, come to an understanding of the water that neither his brother nor even his father had realized—underneath the water lies the word of God. God is within the water and present to witness the majesty and grace of Paul’s ability. The family learned to respect the house of God more so than any other place in the world. Through this respect and humility, Paul found salvation on the water, even though he consistently finds himself in trouble with the law off the water.

CONCLUSION

Each character in the three texts achieves spiritual clarity within the backdrop of their own personal Eden. While each novel has a different setting—Tinker Creek, the Southwest, and Montana—each of the main characters of the novels seek out their own salvation. Even though the settings are different, there is one common underlying theme: water. In life, water is the means by which all living things need to survive. It is, essentially, what allows organisms to grow. Water is the central figure for Dillard, as it is what sustains the multifarious life-forms at Tinker Creek. For Hayduke, the water is what is being restrained in his paradise. For him, this is the same as someone trying to restrain God and he will stop at nothing to ensure that the water, and therefore God, is free to spread throughout the land. Finally, the family in *A River Runs Through It* immerse themselves in the river the same way they immerse themselves in religion. In all these selections, water infuses their paradises with life and is equivalent to God. Once they come to the realization that water is sacred and essential to their paradise, atonement

is the next step in recovering Eden.

The means for which they try to atone for the loss of Eden is to seek out and protect their new version of Eden. Dillard finds her Eden at Tinker Creek and comes to a spiritual revelation at the end of the novel. Hayduke found and lost his Eden, leading him to defend God in the only way he knows how—through physical force. The brothers in Montana have been handed down knowledge of a sanctuary in the river from their father and have respected it to the fullest degree.

Dillard's search for Eden is from the viewpoint of an agnostic. She is not sure what to look for and is initially a passive observer. After witnessing nature up close, it is impossible for her to truly see nature without seeing a higher power behind it. Dillard sees that Tinker Creek is never still; there is always life interacting at all times of the day. This recognition provides the first glimpse of her life being affected by nature. The water flowing through Tinker Creek provides the perfect location for Dillard to experience nature's communion. Her knowledge and understanding of God and nature is purified while at Tinker Creek, similar to one who takes sacrament. At the end of *Pilgrim at Tinker Creek*, Dillard's quest for Eden is completed. She has found God in nature at the creek and rejoices in her discovery. Dillard is providing a path for her readers to find their own Eden, no matter where the location may be. Hayduke's conclusion in *The Monkey Wrench Gang* is a similar one to Dillard's, even if he approaches the quest in a radically different way.

Hayduke's Eden had been taken from him and he responded in the most natural way for him—violence. Tourism was attempting to violate the one place he considered holy and he refused to sit back idly and allow it to happen. His reverence for the desert, and for the power being the vastness of the landscape, pushes him to the point of being a martyr for his beliefs. Similar to Dillard, the wilderness is purity and innocence. Unlike Dillard, however, Hayduke's wilderness has been infiltrated by the bridges, dams and construction which he is determined to destroy. Hayduke's journey is one that is embedded in virtue. He is not only fighting for the loss of his own Eden, but also for what he considers an inevitable loss for all who revere the desert. Hayduke stages his death in order to have the freedom to continue the fight long after he is forgotten about. In this sense, he succeeds and achieves his

own salvation. He is forgotten, but he is not dead. He lives on and presumably will make it his goal to deter the further commercialization of the desert. He views himself as being on a mission from God, and as long as he is on his mission, he is attaining eternal grace.

While Dillard receives a baptism at Tinker Creek through reflection and Hayduke achieves redemption through destruction, Paul and his brother seek out God's grace through active participation. The line between nature and religion was the most blurred for these characters in any of the three selections. They were raised to respect and obey the ways of the river, almost as if it were God himself. They all recognize that "man by nature is a damn mess," and realize that they can save themselves by using the canvas for which God has provided. In order to become closer to God, one had to master the art of fly fishing. However, outside of the river, Paul, like Hayduke, has a tendency towards violence and is searching for a kind of redemption. He is constantly getting into bar room brawls and frequently spends nights locked up in jail. This aspect of his life is meaningless when he has a fishing rod in his hand. He is forgiven in the eyes of his brother and father because of the way he is able to fish God's river. The idea that God has control over the river and Paul is able to fish it more successfully than them suggests that God has already forgiven Paul for his tribulations outside of the river. Paul the man is a mess just like his father described humankind as being, but Paul the fisherman, when in the Eden-like paradise of the wilderness, is a beautiful artist whom God has shined down upon.

Salvation finds many forms for all the characters in these novels. Dillard finds her salvation in the realization that there is a higher power in nature. In this revelation, she is humbled to the point of exultation and begins to rejoice in a dance at the end of the book. Hayduke finds his salvation by interrupting what he considers activities that go against God's will. No death or destruction he inflicts on the companies can equal their destruction on God's landscape. Through his violence and fighting, he becomes somewhat of a force of nature—someone who can not be seen, but whose presence is felt throughout the Southwest. Finally, Paul's salvation comes from active participation in the form of fishing. He knows there is a higher power in the river and spends his entire life attempting to understand it completely. At the end of the novel, his brother and father decide

to watch him fish instead of fishing themselves. They realize they have seen someone master what they desperately seek. These characters took different paths to attain enlightenment, but they all realized that without nature one cannot get close to God and without God one cannot truly see the beauty in nature.

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A CASE STUDY OF A DUAL LANGUAGE PROGRAM IN SOUTHERN NEVADA

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INTRODUCTION

The Clark County School District (CCSD) is currently the fifth largest in the nation. In the 2005-2006 school year, 291,510 students enrolled in (Clark County School District [CCSD], 2006), with 39.3% of them classified as White, 37% as Hispanic, 14.3% as Black/African American, 8.5% Asian/Pacific Islander and .8% American Indian/Alaskan Native (CCSD Board of Regents, 2006). There were an estimated 82,000 English language learners (ELLs) enrolled in 2005-2006 (CCSD English Language Learner Program [ELLP], 2006).

CCSD has turned to dual language programs as one way to promote English language and literacy acquisition. Dual language programs promote bilingualism and biliteracy among both native English speakers and English Language Learners (ELLs) (Soltero, 2004). Clark County School District has seven dual language programs, all in elementary schools.

The purpose of the study was to better understand the impact of a dual language program on schools, teachers, students and families. A case study was conducted on one dual language program in Southern Nevada. The following questions were explored:

1. How has the dual language program impacted the school's climate, relationships (i.e., teacher-

teacher, teacher-parent, student-student), and curriculum?

2. What impact has dual language instruction had on the students' achievement performance?

Data collection included interviews, classroom observations, a study survey, and analysis of secondary achievement data. Findings suggest that teacher characteristics such as consistency, use of language and learning strategies, activities that encourage interaction, time for planning, effective team teaching, and structure are critical to an effective dual language program. Students and parents of students in the dual language program reported many benefits of students receiving instruction in a second language, including the use of higher cognitive skills.

LITERATURE REVIEW

The Clark County School District (CCSD) is currently the fifth largest district in the nation. It is currently home to 193 elementary schools, 53 middle schools, 40 high schools and 31 alternative schools (CCSD, 2006). In the 2005-2006 school year enrollment was up to 291,510 students (CCSD, 2006), with an estimated 295,000 students expected to enroll in the 2006-2007 school year (CCSD Board of Regents, 2006). In the 2005-2006 school year, 39.3% of students were classified as White, 37% as Hispanic, 14.3% as Black/African American, 8.5% Asian/Pacific

Islander and .8% American Indian/Alaskan Native (CCSD Board of Regents, 2006). There were an estimated 82,000 English language learners (ELLs) in 2005-2006 with over 92 languages spoken, the most common were Spanish and Tagalog (CCSD ELLP, 2006).

There are seven dual language programs in CCSD. In dual language programs, teachers instruct students in both the English and Spanish language, the goal being to promote biliteracy, bilingualism and biculturalism within the community. The students that are enrolled in this program are taught to read, write and speak in both languages, as well as to appreciate both cultures. The seven elementary schools that house these dual language programs include Harmon, Herron, McDoniel, Walker, Wengert, Derring, and Hollingsworth. Wengert Elementary School is the very first dual language program to be opened in CCSD. They are entering their sixth year with the program and they are the first dual language program in CCSD to have extended their program to include fifth graders. Dual language programs across the nation have been successful in facilitating English language acquisition for non-native English speakers in a short time (Lessow-Hurley, 2005). Given the large number of ELLs in CCSD, the dual language model could prove to be the most effective program for facilitating English language development among ELLs while at the same time teaching native English speakers a second language before they enter secondary school. The following section provides an overview of second language theories that provide a framework for the dual language model of bilingual education.

THEORIES BEHIND THE DUAL LANGUAGE MODEL OF SECOND LANGUAGE ACQUISITION

Over time, studies of language and culture together have resulted in several theories that explain the process of language acquisition (Peregoy & Boyle, 2005). Language and culture have a great influence on the way one acquires knowledge and develops thinking and conceptual understanding (Soltero, 2004).

INNATIST THEORY

Innatist theorists posit that English learners creatively construct the rules of the second language in a manner similar to those they observed during the first language acquisition (Peregoy & Boyle, 2005). That is, they go through steps of typical language acquisition stages, e.g., pre-production, early

production, speech immergence, intermediate production, and advanced production (Herrera & Murry, 2005). Stephen Krashen, an innatist theorist, developed a series of hypotheses about second language acquisition (Schutz, 2005; Soltero, 2004). First, in the acquisition-learning hypothesis, Krashen claims that there is a distinct difference between acquiring and learning a second language. According to Krashen, acquisition refers to the development of language through meaningful interactions with native speakers. Learning refers to the study of forms and functions of language that are taught in language classrooms (Boyle & Peregoy, 2005). Second, the monitor hypothesis is based on three conditions which are sufficient time; focus on grammatical form, and explicit knowledge of the rules. Krashen suggests that the formal study of language leads to the development of an internal monitor. This monitor ensures the correct usage of grammar when a student produces language. Krashen believes that communication, rather than rote learning, should be the focus of language teaching (Shutz, 2005). Third, in the natural order hypothesis, the rules of language are acquired in a predictable sequence. This means that certain features of grammar and morphemes are acquired throughout the different stages of learning (Peregoy & Boyle, 2005; Shutz, 2005). According to the input hypothesis, the acquisition of a second language is the direct result of a learner's ability to understand the target language in a natural communication situation. In this hypothesis the use of extra cues such as gestures and pictures are essential in making language understandable; this is the basis for what Krashen calls comprehensible input.

INTERACTIONIST THEORY

Interactionists believe that language is learned by both genetic and environmental factors. The interactionist theory is composed of three major inter-related principals. The first major principal is that children, based on prior knowledge, decipher and make sense of their world. Therefore, they are regarded as constructive learners. The second principal is that children use the different selections and sequence of words and structures to learn how to use language in context and for a variety of purposes. The third principal states that the learning of language takes place through the interaction and collaboration of the children and other human beings (Halliday as cited in Soltero, 2004). Also, interactionist scholars view that normal and natural conversations between native and non-native

speakers are essential to the acquisition of a second language

In sum, the dual language immersion model is based on principles from both the innatist and interactionist theories. The innatist theory states that a child must go through steps to learn a second language, much like they did when they acquired their first one (Peregoy & Boyle, 2005). The interactionist theory consists of three major principles which include the belief that language is acquired by both genetic and environmental factors (Halliday as cited in Soltero, 2004). Both theories address the importance of both social and meaningful interactions to students who are learning a second language. An effective dual language program incorporates the aforementioned principles in practice.

DUAL LANGUAGE PROGRAMS

Dual language programs have three main goals. They are to promote bilingualism, biliteracy and biculturalism for all students. In order for a dual language program to be effective it must not only promote these three goals, but the model that is chosen must also be implemented effectively. There are two types of dual language programs used in schools today, one is total immersion and the other is partial immersion. Total immersion is when there is more time allowed for the learning of the second language. Partial immersion is where both languages are taught for an equal amount of time (Soltero, 2004).

TOTAL AND PARTIAL IMMERSION OPTIONS

Total immersion programs will either reflect a 90-10 model or an 80-20 model. In both models the second language is taught at the highest percent with the first language at the lowest. For example in the 90-10 model, Spanish is taught 90% of the time and English is taught for the remaining 10%. This method is used in the primary grades until 2nd grade. As the students progress from year to year, the English instruction is increased. For example in second or third grade, English instruction may be increased to either 20 or 30 percent with the Spanish instruction decreasing accordingly. This continues until about the fourth or fifth grade when instruction is equally given in both languages. Total immersion also requires that teachers be bilingual and biliterate in both languages as most of the instruction will be in the second language (Soltero, 2004).

The partial immersion model, or the 50-50 model, consists of instruction in both the first and second

languages equally. This model can be taught by either one teacher who alternates between languages for an equal amount of time, or by two teachers that work together in a team teaching situation where one teacher teaches only in English and the other one in Spanish. The students are taught in one language for half the day and then they switch into the other language for the rest of the day. Teachers are not required to be bilingual or biliterate in this model, as they can just team teach with a teacher who specializes in the other language (Soltero, 2004).

COMPONENTS

There are a number of essential components that must be met, in order to have an effective and successful dual language program. These are some of the components that have been identified by scholars and educators to be the most important aspects of a dual language program. These aspects include: length of participation, parent partnership, balanced language representation among the students, time allocated for teaching each language, and consideration of the language of initial literacy (Soltero, 2004). Students must participate in a dual language program for at least six to eight years in order for them to be fully biliterate and bilingual in both languages (Lessow-Hurley, 2005). The length of time, six to eight years, is consistent with Cummin's (Cummins, 1999) well known concepts of basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP). These concepts, BIC and CALP, suggest that there are two comprehensive stages of second language acquisition, that, together, could take anywhere from 7-11 years to learn the language and literacy of the second language.

One of the most essential components of a successful dual language program is the involvement and support of the families of the students. Parents must not only understand the program components and how they work; they must also understand the importance of supporting their child as he or she moves through a dual language program (Lessow-Hurley, 2005). It has been proven that without family or academic support, students may take up to seven to ten years, rather than the usual five to seven, to develop their academic language capabilities in a dual language program (Soltero, 2004).

A balance between second language students and first language students is critical to the success of a dual language model. This means that there must be an equal presence of both Spanish speaking stu-

dents and English speaking students. In order to have a successful program, the class must be made up of one-third English only, one-third Spanish only and one-third bilingual students (Nguyen, personal communication, August 24, 2006). The balance of the language via direct instruction or natural interaction is equitable when the number of students in each linguistic category is equal.

Another aspect of language distribution is that the appropriate amount of time is spent on teaching each language. For example, in a 90-10 model it is important to make sure that the students are learning the second language for 90% of the time and the first language for 10% (Lessow-Hurley, 2005). Related to language distribution is the separation of languages. In an effective dual language program, separation should occur by time, space, person, or subject. In a classroom that is self-contained the language is separated by time, one language is taught in the morning and the other in the afternoon or by separating each language by every other day. In a team-teaching situation the languages are separated by the teacher and the classrooms (Lessow-Hurley, 2005).

There are three major reasons for maintaining the two languages separately (Baker as cited in Soltero, 2004). The first reason is to ensure the survival of the second language by establishing purposes for using the language, along with allocating a formal time. Second, when both a mother and a father each speak a different language to a child, also called the one parent one language circumstance; it encourages bilingualism to that child. In this situation children develop stronger bases in their linguistic abilities. The third reason for maintaining the two languages separated is the development of codeswitching, or using the two languages simultaneously with syntactical consistency. Codeswitching early in second language development can lead to using the second language more and may obstruct the development of the first language (Soltero, 2004).

In dual language programs all students learn how to read and write in their native language. However, how much they learn in each language is dependent upon the model that is used. For example, in a 50-50 model the students who speak English learn how to read and write in English and the students who speak Spanish learn how to read and write in Spanish. In the 90-10 and 80-20 models;

however, the minority language is the language of initial literacy (Lessow-Hurley, 2005; Soltero, 2004). Although English is taught gradually throughout the years leading to biliteracy, both educators and parents express a certain amount of apprehension when English speaking students develop literacy in the minority language first. Studies have shown, however, that majority language learners can successfully learn to read and write in the second language before they have developed literacy in their native language (Cloud, Genesee & Hamayan as cited in Soltero, 2004).

CASE STUDY QUESTIONS

In order to better understand the impact of a dual language program on schools, teachers, students and families, the researcher conducted a case study on one dual language program in Southern Nevada. The researcher wanted to examine the following questions:

1. How has the dual language program impacted the school's climate, relationships (i.e., teacher-teacher, teacher-parent, student-student), and curriculum?
2. What impact has dual language instruction had on the students' achievement performance?

METHODOLOGY

VHCS ELEMENTARY SCHOOL

A pseudo name for the elementary school examined in this study will be used for confidentiality purposes. VHCS Elementary School opened in the early 1970's; however, the dual language program began in 2000. The dual language program has been in existence for six years; the kindergarteners who started the dual language program in 2000 will now enter fifth grade, having been in a dual language classroom since kindergarten. The school has adopted the 50-50 model of dual language programs. In this model both Spanish and English are taught for an equal amount of time. They have the dual language classrooms organized in a team-teaching environment, where one teacher teaches in Spanish only and the other teaches in English only. These teachers work together to align their plans in order to make the program run smoothly and effectively. Each teacher has one set of students in the morning and then in the afternoon both classes switch so that each class receives an equal amount of instruction in each language.

CLASSROOM DESCRIPTION

In the study's dual language classrooms, language

arts, math, trophies and specials were taught in the morning and writing, science, social studies and math were taught in the afternoon. Both teachers had the same schedule. Half of the instructional day was taught in Spanish and the other half of the day in English. This was the first year either one of the teachers participated in team teaching and in a dual language program. The teachers worked together to plan their daily schedule and to find resources that would enhance their teaching. They reinforced each other's teaching and worked together to plan and teach difficult concepts. They also used the same management plan. Both teachers explained that consistency and teacher collaboration are extremely important to the success of the program.

The students that make up these classrooms were separated into two groups. One group of students, "the high group" has been in the dual language program for at least two to four years. The "lower group" consisted of students that have been in the dual language program without any prior experience in a dual language program; this was the first year for them. One teacher taught the "high group" in the morning in Spanish, for example, than that same teacher taught the "lower group" in the afternoon in Spanish. The delineation of content for each teacher is described above. The teachers adjusted their materials so language appropriate materials would be used for each of these groups of students.

DATA COLLECTION

The following methods of data collection were used in this study: interviews, observations, study survey, and a review of the school's student achievement data. Ten interviews were conducted. The interview instrument, which included eight open-ended questions, was conducted in person during the school day. The interview participants included one administrator, four teachers, and six parents. The researchers spent 60 hours combined observing in each of the two dual language, team-taught classrooms over a period of three weeks. An observation protocol was used for the purpose of analyzing themes. The protocol consisted of four categories: classroom climate, teaching methods/strategies, classroom management and interaction. In addition, a student survey inquiring about students' perceptions and experiences receiving instruction in two languages was administered to 35 third graders in the dual language program. The survey consisted of 10 questions with no more than three response options each. Most were presented in Likert-format.

Frequency data was obtained from survey responses. School achievement data (Question #2) has not been made available to the public as of September 15, 2006; therefore, an analysis of dual language students' achievement data will not be reported in this draft of the manuscript.

DISCUSSION

The first question in this analysis was examined through observations, interviews, and survey responses. Below are the data, analysis, and discussion for Question #1.

How has the dual language program impacted VHCS Elementary School's climate, relationships (i.e., teacher-teacher, teacher-parent, student-student), and curriculum?

SCHOOL CLIMATE

An analysis of observation notes showed the climate of each of the two dual language classrooms to be positive and upbeat. Both classroom teachers are well organized in their instruction, transitions, and discipline which impacts the climate of the classroom and school. Students show respect for one another and for their teachers. This was evident in their behaviors and comments. The consistent and aligned classroom structure appeared to provide a sense of comfort for students. They transitioned easily from activity to activity and from one classroom in the morning to the other in the afternoon.

Information about school climate was gleaned from the interviews as well. The administrator, for example, discussed how the dual language program has brought notoriety to the school for the achievement gains that have been made by the dual language students, as compared to their traditional program counterparts. His responses indicate there seems to be overall support for the dual language program by both traditional and non-traditional teachers. However, as with any new and/or innovative programs, the dual language classrooms sometimes get more attention and resources from administrators and other district personnel than those in the traditional programs. As one teacher said, there are rumors of favoritism for the dual language teachers. Dual language teachers, for example, receive relatively more resources for professional development, including attending more conferences than their peers. Furthermore, parents' perceptions of the dual language program have been mixed, thus affecting

the climate of the school. The administrator reported that some parents refuse to have their children participate in the dual language program. Some parents as well as traditional program teachers are unsure of the rationale behind the model and, oftentimes, there are questions as to which native English students will be placed in the dual language program and why others won't have this opportunity. One teacher who was interviewed said some teachers in the traditional program are in fear of losing their jobs if the entire school goes dual language. Both teachers and administrators who were interviewed said that more and regular communication with the traditional program teachers and parents about the dual language program (including rationale, advantages, and impacts) is needed.

RELATIONSHIPS

The nature of relationships was discussed in the interviews. A strength noted by both teachers who were interviewed was the partnership and camaraderie between the two dual language teachers. Similarly, and equally important, was the positive student-to-student relationships that school personnel attributed to the dual language program. That is, there is more and regular communication between Spanish-speaking and English-speaking students within the dual language classrooms. One teacher who was interviewed said, the program heightens the self-esteem of ELLs and they are more accepted by their English speaking peers. Another teacher reported that the program opens lines of communication between parents and teachers saying, parents who speak Spanish can communicate more easily with the Spanish teacher and those who are not comfortable with Spanish can speak to the English teacher.

CURRICULUM

The results of the student survey will be discussed here as a component of curriculum. The student survey consisted of ten questions. Thirty-five (35) students, all from the 3rd grade dual language program, answered the questions, 20 girls and 15 boys. Sixty-nine percent (24) reported liking school a lot and 54% (19) described their skills in the second language to be "somewhat strong" at the beginning of the year. Seventeen students (48%) reported having English as their native language whereas 15 students (53%) reported having Spanish as their native language. Over half of the students in the 3rd grade dual language program (25%) reported they had been instructed in two languages in both

2nd and 3rd grade. Forty-nine percent (17) indicated that learning a second language in school has been easy. Twenty-one students (60%) reported they speak the second language both at home and at school and 24 students (69%) said learning in two languages positively helped their reading and writing skills in both English and Spanish. Eighty-eight (29) students reported that learning a second language is very important.

LIMITATION

One limitation of the study was that it was conducted in the summer at the end of the term, thus limiting the time the researcher was able to be in the classroom. Future research needs to be conducted on long-term language and literacy effects of students who participate in a six-year, dual language program. In addition, examining the effects of various teacher-training models on the teacher effectiveness, as well as studying the impact of a dual language program on students' achievement gains, long and short term is recommended. All of these studies would further inform the practitioners as to how to implement an effective dual language program.

CONCLUSION

In summary, the school's climate has been positively impacted by the dual language program. The student-to-student relationships and teacher-to-student relationships have increased in quality and quantity. Among ELLs, learning English in a dual language immersion environment has increased their self-esteem and confidence. The program appears to have opened the lines of communication between the parents and teachers, in that it gives both Spanish and English speaking parents a teacher in which to communicate in the parent's native language. Findings suggest that teacher characteristics such as consistency, use of language and learning strategies, activities that encourage interaction, time for planning, effective team teaching, and structure are critical to an effective dual language program. Although some dissonance between non-dual language teachers and dual-language teachers exists due to competition for resources and inequitable attention, it appears that more training and funds would alleviate these issues.

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MEMORY PROCESSING AND POSITIVE EMOTIONS

BY SHAIDA S. JETHA



INTRODUCTION

Basic emotions are considered by most theorists to be those emotions that are universally experienced. Most theories divide emotions into positive and negative categories, yet differ with regard to which basic emotions make up the se categories (Izard, 1991). Although investigations have not resulted in a discrete number and list of positive and negative basic emotions, fear, disgust, anger, and sadness are included in most negative classifications, and happiness and surprise are included in most positive classifications. Recently, positive emotion theorists have proposed the existence of several other distinct positive emotions (e.g., joy, interest, contentment, love), which are thought to have corresponding cognitive and/or physical response patterns (Fredrickson & Branigan, 2001).

Although several theories have postulated the existence of discrete basic emotions (Ekman, 1984; Frijda, 1986; Izard, 1971; Plutchik, 1980), relatively few studies have attempted to determine whether cognitive processing differs among basic emotion categories. Comparisons of memory for positive, negative, and neutral stimuli have shown consistent support for increased memory performance for positive information in free recall and recognition measures of long-term memory (cf. Bradley, Greenwald, Hamm, 1993; Colombel, 2000; Libukman, Stabler, & Otani, 2004; Shillace & Dragon, 1971; Silverman & Cason, 1934). These findings reflect a

memory bias for positive information. Matlin and Stang (1978) termed this memory bias the Pollyanna Principle, to reflect a general tendency to select pleasant information over unpleasant information, and described the phenomenon as resulting from increased accuracy and efficiency relative to the encoding and retrieval of positive information.

The research this study will be conducting has the potential to significantly inform knowledge of how brain related changes influence the memory for emotional information in older individuals. Findings from this study also have potential to provide important knowledge regarding a memory process yet to be studied in older adults (i.e., emotional memory), but possibly provide a foundation of knowledge that can be later applied to individuals with Alzheimer's Dementia, to develop new psychiatric medications designed to remediate emotional disturbances that occur in this population.

The purpose of this project is to examine differences in memory for emotional words representing happiness, sadness, anger, anxiety, and neutral categories in older adults.

LITERATURE REVIEW

Basic emotions are considered by most theorists to be those emotions that are universally experienced. However, the number of emotions held to be "basic" varies from one theorist to another (Ortony and Turner, 1990). Some theorists classify basic emotions

into only two categories, pain and pleasure (Mowrer, 1960), while other theorists propose the existence of multiple basic emotions, such as happiness, surprise, anger, fear, sadness, disgust, and contempt (Ekman, 1984). Currently, most theories divide emotions into positive and negative categories, yet differ with regard to which basic emotions make up these categories (Izard, 1991). Although investigations have not resulted in a discrete number and list of positive and negative basic emotions, fear, disgust, anger, and sadness are included in most negative classifications, and happiness and surprise are included in most positive classifications. Recently, positive emotion theorists have proposed the existence of several other distinct positive emotions (e.g., joy, interest, contentment, love), which are thought to have corresponding cognitive and/or physical response patterns (Fredrickson & Branigan, 2001).

Although several theories have postulated the existence of discrete basic emotions (Ekman, 1984; Frijda, 1986; Izard, 1971; Plutchik, 1980), relatively few studies have attempted to determine whether cognitive processing differs among basic emotion categories. This is particularly true with regard to investigations of memory and emotion, despite evidence suggesting that different brain regions are involved in the processing of discrete emotions (Panksepp, 1992). The majority of studies examining emotion and memory have subscribed to a dimensional valence-arousal theory of emotion (Bradley, Codispoti, Cuthbert, & Lang, 2001; Cacioppo & Gardner, 1999; Davidson & Irwin, 1999; Dickinson & Pearce, 1977), rather than a basic emotion model (Ekman, 1992; Izard, 1977; Lazarus, 1991; Tomkins, 1962), and subsequently compared memory for positive, negative, and neutral stimuli. Investigations subscribing to the dimensional theory of emotion have shown consistent support for increased memory performance for positive information in free recall and recognition measures of long-term memory (Amster, 1964; Barret, 1938; Bradley, Greenwald, Hamm, 1993; Bradley, Greenwald, Petry, & Lang, 1992; Colombel, 2000; Hayward & Strongman, 1987; Libukman, Stabler, & Otani, 2004; Lishman, 1972a; 1972b; Matlin, Stang, Gawron, Freedman, & Derby, 1979; Phelps, LaBar, & Spencer, 1997; Shillace & Dragon, 1971; Silverman & Cason, 1934; Rychlak & Saluri, 1973). These findings reflect a memory bias for positive information.

Matlin and Stang (1978) termed this memory bias

the Pollyanna Principle, to reflect a general tendency to select pleasant information over unpleasant information, and described the phenomenon as resulting from increased accuracy and efficiency relative to the encoding and retrieval of positive information. With regard to memory, the tendency to remember positive information not only occurred in studies examining experimenter generated lists, but also encompassed the recall of daily experiences and participant generated-lists (Matlin & Stang, 1978). Matlin & Stang (1978) also noted that the differential processing of positive information extended to areas of cognition such as size judgment for pleasant and unpleasant items, the likelihood of responding with a positive word in a free association task, and the likelihood of indicating that the majority of ones' daily experiences are pleasant. It is unknown whether the Pollyanna Principle will be found in older adults, as it is known that regions governing emotion processing (e.g., Amygdala and Hippocampus) deteriorate with age.

Basic emotions are considered by most theorists to be those emotions that are universally experienced. Most theories divide emotions into positive and negative categories, yet differ with regard to which basic emotions make up these categories (Izard, 1991). Although investigations have not resulted in a discrete number and list of positive and negative basic emotions, fear, disgust, anger, and sadness are included in most negative classifications, and happiness and surprise are included in most positive classifications. Recently, positive emotion theorists have proposed the existence of several other distinct positive emotions (e.g., joy, interest, contentment, love), which are thought to have corresponding cognitive and/or physical response patterns (Fredrickson & Branigan, 2001).

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memory bias for positive information. Matlin and Stang (1978) termed this memory bias the Pollyanna Principle, to reflect a general tendency to select pleasant information over unpleasant information, and described the phenomenon as resulting from increased accuracy and efficiency relative to the encoding and retrieval of positive information. It is unknown whether the Pollyanna Principle will be found in older adults, as it is known that regions governing emotion processing (e.g., Amygdala and Hippocampus) deteriorate with age.

METHODOLOGY

PROCEDURE: All testing will be conducted by the primary author, and occur in a quiet setting (laboratory office) located on UNLV campus. The research battery will be individually administered to all participants in one sitting that lasts approximately 2.0 hours. The research battery includes a demographic and medical history questionnaire, the California Verbal Learning Test-II (CVLT-II; Delis et al., 2000), the Emotional Verbal Learning Test (EVLTL), and the Symptom Checklist 90 Revised (SCL-90-R). Detailed descriptions of these procedures are provided in the Research Battery section below. The SCL-90-R is a standardized questionnaire that measures psychological symptoms. This measure is included to determine whether individuals expressing different patterns of psychological symptoms evidence greater memory bias for words related to their levels of psychological symptomatology. Order of memory task administration will be counterbalanced to control for possible carry-over effects related to test presentation and fatigue. After testing is complete, time will be allotted for participant questions, and all participants will be given a debriefing form containing experimenter contact information and information regarding the nature of the study.

RESEARCH BATTERY: The research battery will be individually administered to all participants in one sitting that lasts approximately 2.0 hours. The research battery includes a demographic and medical history questionnaire, EVLTL, and SCL-90-R. Periods of non-verbal testing will occur during the EVLTL long-delay break section.

THE SYMPTOM CHECKLIST 90 REVISED (SCL-90-R) (DEROGATIS, 1983): The SCL-90-R will be included as a means of screening for psychopathology. The SCL-90-R is composed of 90 items that assess psychopathology specific to 9 factors, as well as overall psychopathology. Overall psychopathology is measured

using a global severity index score, which accounts for the contribution of psychopathology from all factors in relation to gender and education. Norms developed for male and female adult nonpsychiatric individuals will be used to assess global psychopathology in the current study.

CALIFORNIA VERBAL LEARNING TEST-II (CVLT-II): The California Verbal Learning Test (CVLT; Delis, Kramer, Kaplan, & Ober, 1987) is a test of verbal learning and memory, which involves oral presentation of 16 words over five immediate-recall trials. Words are presented at the rate of approximately one word per second. After each trial, subjects are asked to recall as many of the words as they can remember. The list consists of 4 words from each of four categories including fruits, clothing, tools, herbs and spices. Following five presentations of the first list (List A) a second list (List B) is presented as a distracter list and subjects are requested to recall as many words as possible from this second list. Immediately thereafter, participants are requested to recall as many words as they can from list A. Cued recall trials are then completed in which the participant is asked, one category at a time, to recall as many of the words in each semantic category as they can from list A by being cued with the categories of fruit, clothing, tools, and spices (Cued recall). Following a 20-minute delay in which non-verbal tasks are performed, the participants are asked to recall as many items from list A in both a free recall and cued recall situations. Therefore, the CVLT measures recall, recognition and list learning; interference effects and retrieval/encoding difficulties can also be evaluated with this measure. The dependent variables used in the study include the number of words recalled on each of the five trials as well as the number of words recalled on list B, upon immediate and cued recall of List A, and following the delayed and cued recall condition for List A. The words on the CVLT have been judged to be of neutral emotional content (Strauss and Allen, unpublished manuscript). The CVLT-II is an updated version of the first edition of the CVLT (Delis et al., 1987).

EMOTIONAL VERBAL LEARNING TEST (EVLTL): The Emotional Verbal Learning Test (EVLTL) (Strauss & Allen, 2005) is a measure of learning and memory for emotional words. The EVLTL is a standardized measure with psychometric properties comparable to popular tests of non-emotional memory (e.g., the CVLT-II). The EVLTL is an emotional analog to the widely used

California Verbal Learning Test (CVLT-II). The EVLT resembles the CVLT-II in format and structure; however, word lists represent discrete basic emotional categories. The task first requires the experimenter to orally present 16 words (List A) over five immediate-recall trials. The list consists of 4 words from each of four categories (Happiness, Sadness, Anger, Anxiety). Following the administration of the five trials, a second "interference list" (List B) is presented for a single trial (including 8 disgust words and 2 words from each of the 4 List A categories). Immediately following List B, a short delay free and category cued recall of List A is conducted. A 20 minute delay then occurs between the presentation of the short-delay and long-delay free recall assessments. Long delay free and cued recall is then assessed. Recognition of List A is measured using a yes-no recognition format immediately proceeding the administration of the long delayed recall. Words included in the EVLT were taken from emotional intensity and categorization norms developed by Strauss and Allen (Unpublished manuscript). List A and B words are empirically validated to represent their intended categories. Further test development procedures and psychometric properties are detailed in Strauss and Allen (Unpublished manuscript).

BACKGROUND MEASURES: Prior to the administration of test procedures, all participants will provide self-report emotionality ratings regarding their present mood-state, as well as their mood state over the past 2 weeks. Self-report ratings will be coded on a 7-point scale, with 1 reflecting little current experience of emotion and 7 reflecting a great amount of emotional experience. Participants will rate their mood state for the emotions of happiness, sadness, anger, anxiety, and disgust. Mood-state ratings will be obtained to investigate the influence of mood-congruent memory.

PARTICIPANTS: 60 older adults (> 65 years) will participate in the current study. Older adult participants will be drawn from the Las Vegas community. The recruited individuals will serve as the subject pool from which the Principal Investigator will draw. Potential participants will be telephoned individually by the Primary Investigator or one of the trained research assistants. Research Staff will inquire as to whether the individual is interested in participating in one of the proposed studies. Potential participants are free to decline participation and are removed from the database should they so request. There will be somewhat greater opportunity for female relative

to male older adults to participate because there is a greater number of female older adults in the population relative to older adult males (Source: Association on Aging). Older adults will receive a stipend of \$20 per session of participation as remuneration for their time and expenses in traveling to the UNLV campus or any inconvenience in having an experimenter come to their residence.

Individuals will be excluded from the study if they speak English as a second language, have a speech impediment, report a current psychiatric or neurological diagnosis, or exhibit severe psychopathology based on routine screening. Individuals will also be excluded if they have a history of psychiatric disorder or treatment, or a history of neurological disorder including traumatic brain injury.

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ASSESSMENT OF GENE EXPRESSION DURING LIFE HISTORY TRANSITIONS IN *DAPHNIA PULEX*

BY ANTHONY QUINN



INTRODUCTION AND PURPOSE OF THE STUDY

The main objective of this study is to describe the structural and bio-molecular changes that accompany major life history transitions in the genus *Daphnia*, a species which is a dominant community component of the plankton of lakes and ponds worldwide. The choice of *Daphnia* is due to its long history as a model research organism, its eco-economic importance, and its complex and fascinating patterns of growth, development, and reproduction. In this ongoing study, the changes that occur during embryological development are being documented, especially in terms of life history comparisons between directly developing embryos versus those which are entering dormancy. The unique and particularly compelling aspect of this study is the parallel and complementary assessment of structural and molecular changes during *Daphnia* ontogeny.

The importance of this study relates to the description of fundamental molecular ecology that accompanies the most important life history transition that these organisms experience. In addition, it will be a contribution to understanding the molecular developmental history of animals which so far has been represented by only a very few species. Because of its synthetic structure, this study is not based on one single previous study. However, the work has been designed based on ideas drawn

from three principal sources. These are "Reproduction in *Daphnia*" (F. Zaffagnini 1987), "Uncovering evolutionary patterns of gene expression using microarrays" (Ranz and Machado 2005), and "Regulation of Diapause" (Denlinger 2002).

This study also has profound implications on the central study case on *Daphnia pulex* that is currently taking place by collaborating scientists at the Center for Genomics and Bioinformatics at Indiana University. This is the principal site of the *Daphnia* Genome Project in the United States. The DPG group is also developing a comparative project on the species *Daphnia magna*, an equally important species outside of North America (e.g. Watanabe et al. (2005) in Japan, Heckmann et al. (2006) in Europe.

LITERATURE REVIEW

The literature review for this study includes three various distinct areas of previous study. The first area is the ecological and evolutionary significance of these questions, the next area is the potential for the application of appropriate molecular "tools" for the analysis of these questions, and the final area consists of the determination of the linkage between molecular activity and morphology.

ECOLOGICAL AND DEVELOPMENTAL PERSPECTIVE

An in-depth description of both parthenogenetic and amphigonic reproduction is provided by F. Zaffagnini (1987) in his paper, "Reproduction in

Daphnia" (Zaffagnini 1987). In this description, Zaffagnini (1987) describes cytological, ultrastructural, and karyological observations of *Daphnia* oocytes during both forms of reproduction, as the developing embryos grew in the mothers' brood pouches. This data set is useful here because he provides specific temporal and chronological measurements for various egg differentiations. Zaffagnini (1987) also makes observations of ephippium formation, fertilization, and spermatogenesis in *Daphnia*. These observations are vital to understanding different events in the early stages of the daphnid embryo. The information on embryogenesis in this paper is one helpful guide to assisting in defining life history stages.

In a comparative study with isolated *Daphnia* embryos, the development of *Daphnia magna* eggs in vitro by Vasil Obreshkove and Alan W. Fraser (1940) tracks the sequence of daphnid developmental events through time. Their article, "Growth and differentiation of *Daphnia magna* eggs in vitro (Obreshkove and Fraser 1940), reveals many discoveries including: the success of culturing daphnid parthenogenetic eggs in vitro that are capable of sexually maturing and producing young, the similarities of nutrition and development time of embryos growing independently after egg deposition versus embryos growing in the brood chamber, and a description of the chronological differentiation that occurs during embryonic development. Obreshkove and Fraser (1940) describe several morphological changes that occur in daphnid embryos from nine hours to forty-six hours after egg deposition, when embryonic development is complete. At nine hours old, the first indication of the cephalic region appears. Then the cephalic and abdominal appendages emerge after eighteen hours. The third major morphological change occurs at twenty-one hours old when the first external evidence of brain development takes place. At thirty hours old, the embryo shows the first signs of movement, a developing eye, and a few irregular heartbeats. Finally, after forty-six hours, the caudal spine extends, and the organism resembles an independent free-swimming individual grown in vivo (as in Zaffagnini, 1987).

Mikael Gyllstrom and Lars-Anders Hansson (2003) describe patterns in diapause termination and its contribution to population dynamics in their paper, "Dormancy in freshwater zooplankton: Induction, termination and the importance of benthic-pelagic

coupling" (Gyllstrom and Lars-Anders Hansson 2003). They use *in situ* estimation of emergence to find a correlation between generation length and the type of cue used for diapause induction. They identify the active cues involved in *Daphnia pulex* diapause induction and termination; these include photoperiod, temperature, and crowding. They also make the argument that adaptive morphological and behavioral responses, such as "neck teeth" and changes in swimming behavior, can affect population survival.

The diversity of temporary aquatic systems, in which many *Daphnia* are found, is discussed in "Temporary aquatic habitats: constraints and opportunities" by Steven S. Schwartz and David G. Jenkins (Schwartz and Jenkins 1999). They define temporary aquatic systems as "those in which the entire habitat for aquatic organisms shifts from being available to being unavailable, for a duration and/or frequency sufficient to substantially affect the entire biota" (Schwartz and Jenkins 1999). This 'availability' refers to the presence or absence of liquid water and the temporal availability of water. Schwartz and Jenkins (1999) state that aquatic organisms in temporary habitats "must either disperse to other habitats or be dormant until conditions permit activity again." The principal mechanism that allows these aquatic organisms to cope with dry conditions is described as a form of dormancy known as diapause, which to some extent can be regulated by environmental cues.

The effect of temperature and photoperiod on zooplankton eggs is studied by Vandekerkhove et al. (2005) in "Hatching of cladoceran resting eggs: temperature and photoperiod" (Vandekerkhove et al. 2005). Vandekerkhove et al. (2005) assert that, "in temperate regions, light and temperature are probably two of the most important proximate stimuli for the activation of zooplankton resting eggs" (Vandekerkhove et al. 2005). In their experiments, temperature had a significant effect on hatchling abundance and was almost always greatest at 10 and 15 degrees, declining with increasing temperature. In contrast, the effect of photoperiod on hatchling abundance varied in different regions. They conclude that, "the stimuli for induction and termination of diapause appear adjusted to the prevailing climatic conditions by natural selection to maximize survival, growth, and reproduction of the local populations" (Vandekerkhove et al. 2005).

D. Weetman and D. Atkinson (2004) perform an even more in-depth analysis of temperature effects on life history stages. In their paper, "Evaluation of alternative hypotheses to explain temperature-induced life history shifts in *Daphnia*" (Weetman and Atkinson 2004), they test the possibility of temperature as a cause for predator responses and if higher temperature reduces energy availability at large size. What they find is that when separate in vitro cultures of *D. pulex* are exposed to different temperatures between 13 and 21 Celsius, the response to fish kairomone does not increase in any of the traits analyzed. In contrast to their first hypothesis, the second hypothesis is supported because the "age of maturity declined and juvenile growth rate increased significantly with raised temperature" (Weetman and Atkinson 2004). These results lead Weetman and Atkinson (2004) to the conclusion that more energy may be invested in early reproduction versus later reproduction, in an adaptive response to higher temperature, in order to produce offspring before essential resources are lost.

MOLECULAR ECOLOGICAL PERSPECTIVE

Pond drought, as a cause of increased *Daphnia pulex* mortality, is ruled out by Jeffrey L. Dudycha (2004) in his paper, "Mortality dynamics of *Daphnia* in contrasting habitats and their role in ecological divergence" (Dudycha 2004). Dudycha (2004) explains that populations of *Daphnia pulex* and its close relative *Daphnia pulicaria* "can be found in close proximity across a large part of North America and thus their divergence is unlikely to be driven by regional geographic separation" (Dudycha 2004). He tests this hypothesis by making a detailed comparison of population growth rates of the two species and by using mtDNA sequence data to estimate the degree of genetic exchange between them. He finds that seasonal state in ponds depends on maternal environment or photoperiod, while seasonal state in lakes is influenced by temperature and resource availability. In either case, Dudycha (2004) states, "populations were never eliminated en masse at the time of drying" and "the drying of ponds cannot be the direct cause of increased mortality rates, and either density-dependent factors or other aspects of seasonal succession are probably responsible" (Dudycha 2004).

In order to test the unfavorable environmental conditions that may cause the replacement of parthenogenetic with sexual reproduction, Allen W. Olmstead and Gerald A. LeBlanc (2001) perform an

interesting study on the regulation of cycling between asexual and sexual reproduction by a hormone, some forms of which can be found in the environment. In their paper, "Temporal and quantitative changes in sexual reproductive cycling of the cladoceran *Daphnia magna* by a juvenile hormone analog" (Olmstead and LeBlanc 2001), they treat four in vitro cultures differing in food concentration and daphnid density with the hormone methoprene. The variations of the controlled cultures are described as: less crowded with high food concentration, less crowded with low food concentration, crowded with high food concentration, and crowded with low food concentration. Their results show, "methoprene can indeed modulate specific components of the sexual reproductive phase of daphnids" (Olmstead and LeBlanc 2001). Olmstead and LeBlanc (2001) also propose that sexual reproduction in *Daphnia* is regulated not by a neuroendocrine response alone but in addition to environmental triggers such as lack of food and crowding.

MOLECULAR DEVELOPMENTAL PERSPECTIVE

The significance of DNA microarrays in discovering new information on gene expression is apparent in Jose M. Ranz and Carlos A. Machado's (2005) paper, "Uncovering evolutionary patterns of gene expression using microarrays" (Ranz and Machado 2005). DNA microarrays are useful because they allow the expression levels for thousand of genes to be simultaneously monitored. This comparison of gene expression is used to study the evolution of genome wide patterns within and between species. Ranz and Machado (2005) claim that "much of the attention of evolutionary geneticists in the past decade has been devoted to understanding the evolution of structural elements of the genome (i.e. DNA sequences, chromosomes and repetitive elements)" (Ranz and Machado 2005). They also state that DNA microarrays help provide a better understanding of the rates of transcriptome divergence in primates, sex-biased gene expression in *Drosophila*, transcriptome evolution in *C. elegans*, and the genetic basis of gene expression differences due to the variation of gene loci with cis-acting and trans-acting regulation.

Since *Daphnia* genomics work including this study is relatively new, the literature from non-daphnid (especially insect) work has been very important in experimental design. Examples of diapause gene regulation are now certain for specific insect species. David L. Denlinger (2002) describes the correlation between up regulated and down regulated genes

with diapause in the fresh fly *Sarcophaga crassipalpis*. He asserts that diapause is associated with rapid decreases in up regulated gene expression and increases in down regulated gene expression which is depicted in the figure below from "Regulation of diapause" (Denlinger 2002). Clearly, there are regulatory modifications that occur for important proteins before and after diapause, as well as early and late stages of diapause.

Studies on the connection between *Daphnia* germ line cells and development are conducted by Kazunori Sagawa et al. (2005) in their paper, "Exploring embryonic germ line development in the water flea, *Daphnia magna*, by zinc-finger-containing VASA as a marker" (Sagawa et al. 2005). Sagawa et al. (2005) display an appealing set of confocal images showing gene expression patterns from the eight cell stage up to the one hundred and twenty eight cell stage. In the experiment, they clone vasa as a potential molecular marker in order to monitor germ line cell development. They also isolate and sequence several contiguous clones covering the entire Dmavas genes plus flanking regions to reveal genomic organization. These observations "suggest that early segregation of germ line cells is a common feature in cladocerans" (Sagawa et al. 2005).

METHODOLOGY

The methodology of this study requires using specific environmental factors such as photoperiod, temperature, and food density to induce dormancy in cultures of free-swimming adults, or terminate dormancy (using temperature and photoperiod) in isolated diapause embryos. It also includes determining the distinctive genes, for both maternal and embryonic life history stages, which are related to free-swimming or dormant reproduction. In order to compare differential gene expression for adult females, detailed life history stages must be determined during each major life history phase. Adult females of *D. pulex* are "staged" using carapace morphology and/or time since last molt. Isolated mRNA is collected from embryos removed from the brood pouch or from a developing dormant embryo. The principal hypothesis is that the initiation of dormancy will be accompanied by profound changes in the distribution of developmentally-significant transcripts (indicating differences in gene expression), relative to non-dormant *D. pulex* clone-mates.

The laboratory procedures used for studying the gene regulation associated with *Daphnia* dormancy

provide an opportunity to gain exceptional exposure to a wide range of experimental methods, including advanced molecular biology techniques. Determining the life history stages provides an understanding of the genetically-determined differences in each stage, and the morphologies that result from that gene expression.

RESULTS

Figure 1 (A-D) shows the results of observations of development of *D. pulex* embryos under *in vitro* culture conditions. This study remains an ongoing process. The measurements of individual organisms, to plot size against the frequency of sizes, were recorded almost daily for a period of approximately three months; those data will form the basis of another paper. In this work are described the morphological changes that occur in the developing embryonic stages and serve as an atlas of *Daphnia* development from nearly every hour between at least three hours after egg deposition and thirty hours old. A small sample of these results is shown here:



Fig. 1 Differential Interference Contrast images of *Daphnia pulex* subitaneous embryos over the course of *in vitro* development. A. Embryo approximately 3 hours after extrusion from the mother. Note the prominent nutritional yolk deposit slightly off-center relative to the main axis of the embryo (long axis: 0.22 mm). B. Embryo approximately 12 hours old displaying the chorion and early demarcations of the cephalic appendages (see arrows). Cell proliferation and differentiation are obvious throughout the embryo, with reduction in the relative size of yolk deposits (long axis: 0.28 mm). C. Dorsal-ventral view of embryo approximately 19 hours old displaying further demarcation of the cephalic and now thoracic appendages and bilateral symmetrical

development (long axis: 0.34mm). D. Lateral view of embryo approximately 23 hours old displaying the separation of the two rami of second antenna. Also note that the yolk deposit persists, but will be completely absorbed (long axis: 0.34mm).

CONCLUSION

In combination, the previous results will help more precisely distinguish *Daphnia* life history stages. The determination of distinct life history events will be useful in verifying the timing of discrete gene expression for each life history stage in the next phase of this work, which will require pooling of many embryos from each stage. Finally, the gene array information will detect the changes in essential protein up-regulation and down-regulation that occur during subitaneous development and before, during, and after daphnid diapause. This will also lead to the ultimate goal of linking differential gene expression, which should vary during times of favorable and adverse environmental conditions, to documented morphological changes.

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GUN AVAILABILITY, PSYCHOPATHOLOGY AND THE RISK OF DEATH FROM SUICIDE ATTEMPT BY GUN

BY THURITHABHANI SENEVIRATNE



INTRODUCTION

The purpose of this study is to analyze the relation between gun availability, individual psychopathology and lethality of gun related suicide attempts. Suicide is the third leading cause of death among young people aged 15 to 24, and is the eleventh leading cause of death in the United States. Firearms play an important role in suicide as well. Suicide by firearms was the most common method for both men and women, accounting for 55 percent of all suicides.

This study is primarily based on "Lethality of firearms relative to other suicide methods: a population based study" (Shenassa, Catlin, and Buka, 2002) as well as "Gun availability, psychopathology and risk of death from suicide attempt by gun" (Shenassa, Catlin and Buka, 2000). The first article discusses suicide prevention techniques, some which were successful and others, which were not so successful. The principal goals of this study were to "(1) to quantify lethality of firearms relative to other suicide methods, (2) to quantify the extent to which suicide mortality may be reduced by limiting access to firearms" (Shenassa et al., 2002). Data on completed suicides was collected from the annual mortality data files of the Chicago Department of Public Health and data on para-suicides (attempted suicides) was collected from administrative hospital discharge data compiled as part of an Illinois State mandate. The data spanned the years 1990-1997. The key results of the study were:

- 1) "Firearms are the most lethal suicide method independent of age and gender.
- 2) Preventing access to firearms can reduce suicide mortality by 32% among minors who would have otherwise used firearms.
- 3) Universal approaches to suicide prevention that do not require identification of at risk individuals deserve serious consideration" (Shenassa et al., 2002).

The second study discusses how:

- 1) Those attempting suicide by gun are about 70 times more likely to die from their injuries than those attempting suicide by other means.
- 2) Depressed and psychotic individuals compared with individuals with no mental disorders are significantly more likely to attempt suicide with a gun ($p < .001$).
- 3) Inclusion of community-level gun availability in a hierarchical model reduced the variation in the model by 16% (Shenassa et al., 2000).

LITERATURE REVIEW

It is believed that the sociological aspect of this project is extremely pertinent, considering the stunning proportions of suicide and suicide attempts today. Knowing the impact of gun availability on the lethality of suicide attempts by firearms could also result in a noteworthy understanding of the sociological impact of firearms.

There have been previous studies related to this topic. Some have focused on the differential effects of gun availability on firearm-related suicides versus homicides (Kaplan and Geling, 1998). They found that gun availability had a stronger impact on the rates of firearm related suicides than firearm related homicides. Another interesting study was done to analyze the possible differences between urban and rural firearm-associated suicides. These researchers used 584,629 deaths from 3141 US counties between the years 1989 through 1999. The results were remarkable; they found that gun related suicides in rural areas were as frequent as in urban settings (Branas, Nance, Elliott, Richmond, and Schwab, 2004). According to research on "Guns, violent crime, and suicide in 21 countries" (Killias, van Kesteren and Rindlisbacher, 2001), the connection between gun ownership and gun suicide rates is quite strong even if the United States was excluded, considering it to be an extreme case.

Many studies have been done in respect to gun ownership or ready availability in the home in correlation to gun related suicides and suicide attempts as well as the impact of the reduction of gun ownership on suicide. Kellerman, Rivara and Somes (1992) found that availability of firearms in a home was associated to suicide rates. After they "controlled for these characteristics through conditional logistic regression, the presence of one or more guns in the home was found to be associated with an increased risk of suicide (adjusted odds ratio, 4.8; 95 percent confidence interval, 2.7 to 8.5)" (Kellerman, et al., 1992). According to other research, "the risk of dying from a suicide in the home was greater for males in homes with guns than for males without guns in the home (adjusted odds ratio = 10.4, 95% confidence interval: 5.8, 18.9). Persons with guns in the home were also more likely to have died from suicide committed with a firearm than from one committed by using a different method (adjusted odds ratio = 31.1, 95% confidence interval: 19.5, 49.6)" (Dahlberg, Ikeda and Kresnow, 2004). Yet another study on the correlation between safer storage methods of firearms in a home and the risk of suicide showed that "[D]ecedents with access to firearms at home were 18 times as likely to commit suicide by a firearm than to die from other causes" and that "[C]ompared with decedents who stored their firearm unlocked or loaded, those who stored their firearms locked or unloaded, or both, were less likely to commit suicide by firearms (locked: OR = 0.39, 95% CI = 0.24 to 0.66; unloaded OR = 0.30, 95% CI = 0.18 to 0.49)" (Shenassa, Rogers, Spalding and Roberts, 2004).

Connor and Zhong, (2003) found in their research about "State firearm laws and rates of suicide in men and women," that restrictions on firearms has the potential to reduce the suicide rate. Research done by Lester and Leenaars (1993), which examined the use of guns in suicide before and after the Bill C-51 was implemented in Canada in 1977 to curb the use of firearms, showed a significant reduction in firearm suicides in Canada. This again illustrated the point that limiting access to guns could cause a decline in firearm suicides. Not only in Canada, but also in the United States, the reduction of household firearm ownership has shown significant changes in gun related suicides. (Miller, Azrael, Hepburn, Hemenway and Lippmann, 2006). This study was done by using a time series analysis comparing the changes in suicide rates to firearm prevalence. Studies of gunshot suicides in England have shown that since England has some of the most stringent legislation for gun ownership, the rates of gun related suicide is becoming less common. (Sutton, Hawton, Simkin, Turnbull, Kapur, Bennewith, Gunnell, 2004).

Beautrais, Fergusson and Horwood (2006) completed a study of the impact of introducing new restrictive firearms regulations (Amendment to the Arms Act, 1992) in New Zealand and established that similar to other countries, the restrictive legislation cause a significant decrease in gun related suicides. The data they used were for 8 years before and 10 years following the introduction of the regulations. Research done on "Gun Storage Practices and Risk of Youth Suicide and Unintentional Firearm Injuries" has also showed that, "The 4 practices of keeping a gun locked, unloaded, storing ammunition locked, and in a separate location are each associated with a protective effect and suggest a feasible strategy to reduce these types of injuries in homes with children and teenagers where guns are stored" (Grossman, Mueller, Riedy, Dowd, Villaveces, Prodzinski, Nakagawara, Howard, Thiersch and Harruff, 2005). A study was also done by using negative binomial regression models to estimate "the association between state and federal youth-focused firearm laws mandating a minimum age for the purchase or possession of handguns and state child access prevention (CAP) laws requiring safe storage of firearms on suicide rates among youth" (Webster, Vernick, Zeoli and Manganello, 2004). Their results however, were not very strong in proving that these youth targeted firearms laws caused a reduction in youth suicides.

On the other hand, another study that was done across all 50 states evaluating state firearm regulations

and homicide and suicide rates, showed that laws that eliminate most gun regulations like “shall laws” (laws permitting an individual to carry a concealed weapon unless restricted by another statute) can cause an increase in gun related suicides but that no law had a direct impact on the reduction of suicides (Rosengart, Cummings, Nathens, Heagerty, Maier, and Rivara, 2005). They used five different state gun laws to establish a possible connection with firearm lethality. The laws used were; “(1) “Shall issue” laws permitting an individual to carry a concealed weapon unless restricted by another statute; (2) A minimum age of 21 years for handgun purchase; (3) A minimum age of 21 years for private handgun possession; (4) One gun a month laws which restrict handgun purchase frequency; and (5) Junk gun laws which ban the sale of certain cheaply constructed handguns” (Rosengart et al., 2005).

The research objectives of my study are primarily to replicate the research project “Gun availability, psychopathology and risk of death from suicide attempt by gun” (Shenassa et al., 2000) and build further upon it. Therefore the main research aims are to “1) quantify the risk of death from para-suicide by gun versus other methods, 2) determine whether individual with psychopathology are more likely than others to attempt suicide by gun, 3) determine proportion of variation in para-suicide by gun explained by community-level gun availability independent of individual-level determinants of para-suicide by gun” (Shenassa et al., 2000).

METHODOLOGY

In order to achieve these goals, hospital admission records were obtained for the years 1990-1997 from the Illinois Health Care Cost Containment Council. These records were examined for cases of suicide or attempted suicide. Eleven thousand-five hundred and eighty four patients were identified with an analysis of para-suicide (E950-E959, classifiable to ICD-9CM). The individual –level variables used for this study were: patient status upon leaving the hospital (dead or alive), age, gender, suicide method (gun or other) and the community-level variables were proportion of gun availability (partitioned into quartiles) as measured by proportion of homicides by gun (q2 = Lowest 25%, q3 = 50%, q4 = 75%), median household income, percent of residents in poverty, and percent of residents unemployed. Variables describing other social characteristics include percent of male residents, percent of residents that are young adults (ages 20-29), percent of residents that graduated high

school, percent of residents that rent and percent of residents that are single, defined as divorced or never married. The zip code itself has no impact on the outcome, yet, the neighborhood effect which is defined by zip code, may have an effect. Researchers have yet to consider psychopathology into the equation.

Many computer packages were used in the process of analyzing the data. Research staff used R - which is a programming language and software for statistical computing and graphics, WinBUGS – which is Bayesian inference Using Gibbs Sampling used for the Bayesian analysis of statistical problems using the Markov Chain Monte Carlo methods, SAS, and CODA- which is a graphical package for statistical analysis. Staff utilized the Generalized Linear Model in order to analyze the data and interpret the coefficients:

The *generalized linear model* is a generalization of the linear regression model such that (1) nonlinear, as well as linear, effects can be tested (2) for *categorical predictor variables*, as well as for continuous predictor variables, using (3) any dependent variable whose distribution follows several special members of the exponential family of distributions (e.g., gamma, Poisson, binomial, etc.), as well as for any normally-distributed dependent variable” (<http://www.statsoft.com/textbook/stglz.html>).

CONCLUSION

Mathematically this can be written as:

$$E(Y|x) = \beta_0 + \sum_{i=1}^p \beta_i x_i \varphi$$

The Logistic Regression

model was used and we used the binomial family which uses the “logit link function”. This is denoted by:

$$g(p) = \text{logit}(p) = \log \frac{p}{p-1}$$

For further study, we will be using the Generalized Linear Mixed Model, which is denoted by;

$d_{ij} = (b_0 + b_{i0}) + (b_1 + b_{i1})^*$ (characteristics of individuals in each zip code) $_j + S_{ij}$. As there is much more research that needs to be done before the study is completed, there will be continuing research on this study throughout the next two semesters.

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CHARACTERISTICS OF LOW BACK PAIN PATIENTS SEEKING HELP FROM VARIOUS HEALTH CARE PROVIDERS

BY TEDDY BOADO SIM JR



INTRODUCTION

The human back is a complex matrix of bones, muscles, ligaments and joints. Anyone can simply sprain ligaments, strain muscles, irritate joints and rupture joints, all of which can lead to low back pain. Sometimes the simplest of movements, such as, picking up a basketball from the floor, can have painful results. Other means of low back pain include arthritis, poor posture, obesity, and psychological stress. Back pain can also result from disease of the internal organs, such as kidney stones, kidney infections, blood clots, or bone loss. Low back pain has become one of the biggest areas of concern in the health sector. In fact, 31 million Americans experience low back pain at any given time (Jensen). According to the American Chiropractic Association, back pain is one of the most common reasons for missed work. In fact, back pain is the second most common reason for visits to the doctor's office, outnumbered only by upper-respiratory infections.

Low back pain has been established as a serious problem, however another issue that may cross many minds of low back pain patients is, who should treat it. Choosing a healthcare professional to treat or relieve low back pain can be a difficult task for some people. A traditional medical doctor, along with a nurse practitioner, generally treats the pain with medication. However, there are alternative health care choices people may seek to treat or relieve back pain, without having to take medica-

tion. Chiropractors and acupuncturists are two professions offering relief from back pain through varying types of therapy such as spinal manipulation, additional treatments included heat, cold, diathermy, ultrasonography, electrical stimulation, and traction. Finally, the doctor of osteopathic medicine who incorporates manipulative therapy, like chiropractors, but also prescribes medication if needed, like the traditional medical doctor or nurse practitioner. Despite the variety of treatments, the rapid growth of chiropractic treatment has allowed it to be the dominant form on non-medical treatment (Eisenburg, 1993).

LITERATURE REVIEW

Low back pain is such an important research topic, a research was conducted including the characteristics of low back pain in adolescents. Low back pain in adolescents is perceived to be uncommon in the clinic setting. However, previous studies have suggested that it may be an important and increasing problem in this age group. The study was to determine the occurrence and important symptom characteristics of low back pain such as duration, periodicity, intensity, disability and health seeking behavior at young ages. Of those reporting low back pain, 94% experienced some disability, with the most common reports being of difficulty carrying school bags (Watson, 2002).

A similar study, in Switzerland, Fribourg, identified

other characteristics with children with back pain. Characteristics that were identified in this study included: back pain history, family characteristics, children's activities, and psychological and social characteristics. This research had interesting results that emphasized the psychological factors in children as a major characteristic contributing to their low back pain. Psychological factors were significantly associated with reported nonspecific low back pain and its consequences as well as with sibling history of low back pain (Balague, 2006).

Patient attitudes and beliefs are some characteristics that play a big role in determining what kind of health care provider the patients wants to seek. People in general believe only certain kind of doctors, through experiences or simply by word of mouth, the effectiveness of treatment for low back pain. In 1994, a study was carried out among 103 chiropractic patients and 187 medical patients treated for low back pain in a multi-specialty group practice in California, three months after initial treatment. The results suggested that chiropractic care was at least as effective as medical care in reducing the number of episodes of pain and functional disability, and chiropractic patients were more likely than medical patients to perceive their treatment as successful (Hurwitz, 2006).

An important factor to consider when it comes to patient attitudes in choosing a healthcare provider for low back pain is how the low back pain patient and the health care provider share similar beliefs about the treatment. For instance, chiropractic patients and doctors of chiropractic most likely share similar beliefs about the central tenets of chiropractic practice. The relationship where both patient and doctor share similar beliefs may be an important predictor or characteristic of patients self-referral decisions. The Canadian province of Saskatchewan, about half the patients with low back pain sought care from chiropractors or both chiropractor and medical doctor (Cote). Logistic regressions showed that people who consulted a doctor of chiropractic alone had less comorbidities, younger, usually lived in urban areas and have better physical and social functioning. In comparison, findings from another recent study of patients with low back pain showed chiropractic patients were comparable with those treated by medical doctors, although patients studied has poorer functioning than the general population (Coulter, 2002).

Aside patient attitudes, sociodemographic characteristics may also result from researches dealing with low back pain patients. Investigators compared chiropractic patients with those who saw other providers when there was no control for a study comparing chiropractic users and nonusers. Logistic regression showed chiropractic users were most likely to be male, White and with a high school education (Shekelle). Two other studies were conducted on low back pain to reach to a conclusion on sociodemographic characteristics. In the 1989 National Health Interview Survey, Hurwitz and Morgenstern found a variety of differences in characteristics. For instance, the high school graduates, unmarried and unemployed were more likely to use chiropractic care, whereas, non-Whites and people with disabling comorbidities were less likely to use chiropractic care. Family income, self-perceived general health status, insurance coverage (private prepaid, Medicare only, Medicare plus private, private fee-for-free service, other or none), and age had no effect on patient choice in the National Health Interview Survey. In 1992, a sample of North Carolina patients found only 3 independent sociodemographic characteristics when seeking chiropractic care: adequate insurance (other than Medicaid or Medicare), better in health and have milder pain (Hurwitz, 2006).

A recent study conducted by Haas, Harma and Stano, 2003 in Oregon, has shown the importance of patient attitudes, health status and insurance in self-referral decisions. Their study identified predictors of patient choice of a primary care medical doctor or chiropractor for treatment of low back pain. The method they used consisted of data from initial visits which were derived from a prospective, longitudinal, non-randomized, practice-base observational study of patients who self-referred to medical and chiropractic physicians. Logistic regression showed differences between patients who sought care from chiropractors vs. medical doctors in terms of patient health status, sociodemographic characteristics, insurance, and attitudes. Disability, insurance, and trust in provider types were also important predictors.

Another study, in North Carolina, wanted to determine whether outcomes vary according to the type of provider initially seen for an episode of low back pain, identified interesting characteristics. The demographic characteristics of patients seeking treatment from rural and urban medical doctors and chiropractors, orthopedic surgeons and a HMO provider,

were all generally similar, although there were statistically significant differences from a number of variables: family income, functional status, educational level and status with respect to workers' compensation (Carey, 2006). Interestingly in Carey's study, patients who saw chiropractors reported a significantly higher degree of satisfaction than those who saw a primary care physician, orthopedic surgeon or HMO provider. A logistic regression analysis showed that the patients who saw orthopedic surgeons were somewhat more satisfied than the patients who saw primary care providers but were less satisfied than those who saw chiropractors.

The purpose of my research is to determine the differences in characteristics of patients with low back pain who sought treatment from various health care providers: medical doctor, doctor of osteopathic medicine, doctor of chiropractic, nurse practitioner, acupuncturist, etc. My hypothesis states there is a significant difference in characteristics of low back pain patients seeking various health care providers, especially between medical doctors and chiropractors.

METHODOLOGY

Dr. Melva Thompson-Robinson contacted Dr. Mitchell Haas at Western States Chiropractic College to request a copy of the survey used in the research he, Dr. Sharma and Dr. Stano utilized for research they did on Patient Attitudes, insurance and other determinants of self referral to medical and chiropractic physicians. Dr. Melva Thompson -Robinson and the McNair Scholar reviewed the survey and slightly modified it to make it applicable to this research. The information emphasized in the survey included low back pain history, duration and severity of current episodes, demographics, insurance characteristics, and selected psychosocial factors. The severity of pain was measured using 100-mm Visual Analogue Scale (VAS) score, where a score of 0 denotes "no pain" and 10 denotes "excruciating pain" (Huskisson). Psychosocial characteristics included questions related to stress and confidence in successful treatment outcome. The Krantz Health Opinion Survey (HOS) entailing both behavioral and information subscales were used to measure patient attitudes toward self-care and involvement with medical care, as well as medical decisions (Baur). In the HOS, scores ranging from 0 to 9, higher scores indicated more favorable attitudes.

The finalized survey was re-created on www.surveymonkey.com,

which is a web-based survey software. After completing the survey, the IRB application was submitted in the beginning of July 2006 and received approval August 16, 2006. For recruiting subjects for the research, the snowball technique was used. Dr. Melva Thompson-Robinson and the McNair Scholar contacted people that we already knew and had them complete the survey, if appropriate. The participants who completed the survey were asked to refer other people to the survey. All participants in the survey had to have had sought treatment for low back problems and be at least the age of 18.

The research conducted is a cross sectional, non-randomized observational study. The purpose of my research is to determine the differences in characteristics of patients with low back pain who sought treatment from various health care providers: medical doctor, doctor of osteopathic medicine, doctor of chiropractic, nurse practitioner, acupuncturist, etc. The hypothesis states there is a significant difference in characteristics of low back pain patients seeking various health care providers, especially between medical doctors and chiropractors.

For data collection, the web-based survey was posted on [surveymonkey.com](http://www.surveymonkey.com) for the study period. Participants were directed to the website in order to complete the survey at their leisure. Using their mouse, participants marked their responses on the survey instrument. When the participants completed the survey, they clicked the submit button which uploaded their responses into the database. All the collected data was imported into Microsoft Excel, where the data was cleaned and prepared for data analysis. The final data set from Microsoft Excel was imported into Statistical Package for the Social Science (SPSS) version 14 for statistical analysis. Appropriate univariate and multivariate analyses was then conducted.

RESULTS

Of the 145 participants who accessed the survey, 91 participants completed the survey. Table 1 presents the response frequency variable table, which identifies the different characteristics and the mode (most chosen). The majority (39.3%) of the sample rated themselves to be in very good current health standing. 31.9% of the sample say their episode of low back pain was less than a week, 44% feel the times they experienced low back pain in the past was more than five episodes and 68.1% says the pain they experience does not travel anywhere else in

their body, only their back.

As far as sociodemographics are concerned, majority of the population sample were Caucasian, married, worked full time, had an annual income of \$72,000 or more, had a high level of education, never smoked and did not indicate having significant emotional problems. Majority of the sample population had insurance through and employer or union that mostly paid any expenses for services. Most of the participants from the survey seeking current treatment from someone other than a chiropractor, agreed that if their insurance would cover it, they would see a chiropractor for low back pain treatment.

Table 1. Frequency descriptive characteristic analysis
Frequency table in characteristic choices

Characteristic(Variable)	Frequency	Percent (%)	Mode (of answers)
How long the episode of LBP lasted	29	31.9	< 1 week
How many times had LBP in past	41	45.1	> 5 episodes
Where the pain travels	62	68.1	Back only
Current health	35	38.5	Very good
Health care provider	36	39.6	Medical Doctor
BELIEFS			
Trust Medical Doctors	36	39.6	Agree
Trust Chiropractors	30	33.3	Agree somewhat
Against taking prescription drugs	23	26.1	disagree
MD=DC treatment	20	22.2	disagree somewhat
EXPERIENCE/RAT			
Medical Doctor	22	24.4	satisfi ed 22%, Ex dissatisfi ed 20%
Doctor of chiropractic	32	35.2	Extremely dissatisfi ed, 20% satisfi e
Nurse practitioner	58	63.9	Extremely dissatisfi ed
Acupuncturist	70	76.9	Extremely dissatisfi ed
Doctor of osteopathic medicine	65	71.4	Extremely dissatisfi ed
How was your provider recommended	45	51.1	Sought myself
Confidence towards your provider	37	42.5	somewhat certain
Do not ask questions from your doctor	28	31.1	Strong disagree
Doctors make all your health decisions instead of offering choices	21	23.1	Strong disagree
ASK Questions	31	35.2	Agree
Better to trust provider than to question what they are doing	29	31.9	Disagree
Have option of choices for what is best healthwise	35	38.8	Agree
Race	30	33.7	Caucasian
Marital status	43	48.3	Married
Employment	69	77.5	Full time
Occupation	49	55.7	Professional/technical
Education	33	37.1	Graduate/professional college
Smoke	53	59.6	Never
Income	38	43.2	\$72,000 or more
Private health insurance	73	83	Yes
Source of insurance	46	63	Employer/union
If covered, would you consider another provider?	45	51.7	Yes
What kind of provider would you consider?	15	16.5	Chiropractor
How do you expect to pay?	61	72.6	Health insurance/medicare
Does your insurance pay for all expenses?	44	48.4	Mostly, not completely
LBP=low back pain			
* frequency values are out of 91 participants			

Patient attitude covered questions regarding their beliefs and trust toward their provider. Majority of the population sample felt that they “agree” in trusting their medical doctor, “agree somewhat” in trusting their chiropractor, “disagree” in refusing to take prescription drugs and “disagree somewhat” in feeling that medical doctors and chiropractors have the same effect of treatment for low back pain. The sample population unanimously feels “extremely dissatisfied” with a doctor of osteopathic medicine, acupuncturist and nurse practitioner treatment for low back pain. Treatment from a medical doctor and chi-

ropractor has a higher percentage of satisfaction from the sample population. However, it is the medical doctor who rates higher in satisfaction overall for low back pain treatment.

There is an even distribution for both chiropractor and medical doctor when it comes to trust and satisfaction of treatment. The percentages were very high in “strongly agree, agree, somewhat agree” for trust in both chiropractor and medical doctor. Additionally, the table also shows very high percentages in all “extremely satisfied, satisfied, somewhat satisfied” for both chiropractor and medical doctor in low back pain treatment. Interestingly, a higher percentage of respondents were “extremely satisfied” treatment for low back pain from chiropractors than

medical doctors, but also a higher percentage in “extremely dissatisfied.” Another important character analyzed in the study was majority of the people who had the option to seek a different provider, given that their insurance would cover it, would most certainly see a chiropractor.

Table 2 shows the results of t-test calculations that were used to assess whether the patient characteristic means were statistically different between those patients seeing a chiropractor for low back pain versus those seeing a medical doctor. Of the four different types of characteristics, only patient attitude showed significant differences. The differences in attitude characteristics included: trusting chiropractors, how confident the patient is towards the physician and the thought that recovery is usually quicker under the care of a doctor than when patients take care of themselves.

Table 2. T-test between characteristics of low back pain patients from a Chiropractor and Medical Doctor

Group Statistics. T-Tests between MD's and DC's differences in characteristics						Levene's Test for Equality of Variance	
Variable	Provider	Mean	Std. Deviation	Std. Error Mean	F	p (Sig)	
Trust DC	MD	3.58	1.763	0.294	5.1	0.027	
	DC	2.5	1.218	0.215			
Confidence	MD	2.89	0.867	0.147	4.014	0.049	
	DC	2.52	1.253	0.218			
Recovery	MD				4.39	0.04	
	DC	2.94	0.873	0.147			
		3.09	1.228	0.217			

MD= medical doctor
DC= doctor of chiropractic

Table 3 shows the results of chi square tests used to show association between sociodemographic characteristics and choice in provider. One of the sociodemographic characteristics showing association is employment status. Full time employed personnel tend to have an association with choosing a health care provider. Another sociodemographic characteristic showing association, deals with their insurance coverage for other health care providers. Majority of the participants would seek out another provider, preferably a chiropractor, if the insurance covered it.

Table 3. Chi-square test on sociodemographic characteristics

Chi test (Crosstabs)- sociodemographic characteristics			
Characteristics	Value	df	Pearson Chi-Square
			Asymp. Sig (2 sided)
Employment status	8.75	3	0.033
Different provider if insurance covered it	14.776	1	0.000

CONCLUSION

This study found differences in characteristics for patients with low back pain seeking different health care providers. The characteristics that showed difference were health status, patient attitude, sociodemographic characteristics and insurance. This research team was able to identify some characteristics of low back pain patients seeking different health care providers, predominantly medical doctors and chiropractors. However there is more research to be done.

As with all studies, this study has its limitations. A major limitation to the generalizability of these findings is the lack of reliable empirical evidence on

costs, outcomes, and forces that influence patient choice of provider. Another limitation to this research was that the majority of the sample population was highly educated. Given more time, perhaps we could have a larger sample population.

This study helps to fill some of the information gaps on the determining factors for chiropractic utilization for low back care. The results regarding patient health status opinions and attitudes are clear. One important thing that we found was that the source of payment for care is very important. In my research, it has been analyzed that majority of the people who had the option to seek a different provider, given that their insurance would cover it. Data from 1993 to 1995 indicated that only 75% of those with private coverage had chiropractic benefits (only 44% for HMO enrollees), and that most who did have such benefits faced coverage restrictions such as visit or dollar limits (Jensen, 1999).

The majority of the patients with low back pain seek treatment from medical doctors and not chiropractors in this study. The Haas research in patient attitudes towards low back pain concluded that low back pain patients were more likely to choose a chiropractor instead of a medical doctor. Factors that may distinguish the difference between the findings is that this sample was smaller, were highly educated, and had a greater distribution of minorities. Current analyses also revealed that patient attitudes with trust in their health care provider showed a significant association with health care provider choice. Patients who are currently seeing a chiropractor tend to stick to only chiropractic care. Whereas, patients with low back pain seeking treatment from a medical doctor, would consider seeing a chiropractor instead.

This study does not fully expose the complex financial incentives facing patients as they choose a provider. Chiropractic coverage is becoming a nearly universal benefit in private insurance (Cleary-Guida, 2001). Chiropractors are much more restricted on medical insurance than medical doctors for services. Restriction on utilization is far more severe on chiropractic care than medical care (Stano). The chiropractic profession, considered alternative medicine, is increasingly integrated into managed care, at least partly in response to patient preferences (Jensen). This research will play a role in education as an indirect way to influence attitudes and thus encourage more cost effective choices in health care providers.

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EXAMINING THE PSYCHOMETRIC PROPERTIES OF THE ETHNIC CONSIDERATIONS IN THERAPY SCALE

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INTRODUCTION

The U.S. 2000 Census projection predicts that from the year 2000 to 2050 the number of ethnic citizens will represent half of the nation's population (Hall 1997). Further, ethnic minorities are increasingly seeking mental health services (Sue 1999). Issues between culture and mental health have been identified. For instance, researchers (e.g., Sue & Sue, 1999; Maramba & Hall, 2002) believe that cultural differences between client and clinicians may hinder the therapeutic alliance. In addition, acculturation levels (i.e., adjusting to a new culture) of ethnic clients and mental health have provided substantial correlations.

Evidence supports that mental health and acculturation levels significantly impact the therapeutic relationship. For instance, Ponterotto, Baluch, and Carielli (1998) demonstrated that individuals with higher levels of acculturation have shown positive attitudes toward therapy providers when compared to lower acculturated individuals. In another study, lower acculturated participants articulated more liking for ethnically similar counselors than higher acculturated corresponding participants (Atkinson, Wampold, Lowe, Matthews, & Ahn, 1998). Even though acculturation measures are helpful in obtaining information relevant to which ethnic minority cultures diversify from the host Caucasian culture, application of these measures has been limited in clinical practice (Donohue et al., in press).

Moreover, the researchers assert that client responses to acculturation measures do not allow therapists to properly assess the level to which client responses are relevant to the treatment planning. In fact, a key aspect in understanding culture is to recognize and assess the extensive variability that exists within certain racial, ethnic, and cultural groups (Ponterotto et al., 2001).

Although, these previously mentioned guidelines are utilized in clinical practice, Donohue and colleagues assert that multicultural guidelines have no specific procedures to follow, as a result assessment and employing the culturally specific strategies are complex and unreliable. Consequently, they argue that with the continual increase in ethnic populations, these approaches are essential. However, when investigating other options Miranda, Nakamura, and Bernal (2003) specify that it is unrealistic to investigate every minority subgroup. Further, Cuellar (2000) asserts that generalizing behaviors of ethnic minority individuals to a similar ethnic minority group is not advisable, especially when considering that, "A key component in understanding culture is to acknowledge the great variability existing within particular racial, ethnic, and cultural groups" (Ponterotto et al., 2001, p. 119). Donohue et al. (in press) indicate that common cultural knowledge about certain ethnic cultures can be learned. However, due to ethnic diversity within group variability this knowledge may or may not be

appropriate for specific members of that culture.

LITERATURE REVIEW

Due to wide heterogeneity of similar ethnic minority groups, it is essential that clients be assessed on an individual basis using standardized procedures to assess the degree and style to which ethnicity is presented in therapy, therefore the present methods of assessment and therapeutic results can be evaluated (Donohue et al. in press). Indeed, the researchers argue that acculturation measures provide the extent and style to which ethnic minorities differ from the host Caucasian culture. However, the tools do not evaluate the degree to which clients want ethnicity incorporated into therapy. For instance, cultural sensitive therapeutic approaches may not be relevant to the client's current issues that brought them to therapy. Clients assessed on an individual basis for ethnicity factors, may help alleviate therapeutic cultural barriers. Further, utilization of semi-structured interviews in assessment with ethnic minorities has demonstrated fewer issues when compared to the unstructured clinical interview (Aklin & Samuel, 2006).

Therefore, Donohue et al. (2006) developed a culture-specific semi-structure interview by first developing the Consideration of Ethnic Culture in Therapy Scale (CECTS) with 279 diverse university students. CECTS assesses the extent to which individuals perceive the importance and relevance of ethnicity in treatment. Results demonstrated two factors that explained 71% of the variance (Ethnic Cultural Importance, Ethnic Cultural Problems), while internal consistency and convergent validity were satisfactory. Results also indicated that the CECTS may be particularly appropriate for ethnic minorities since they demonstrated significantly higher scores than Caucasians. Hence, CECTS demonstrated applicability to all ethnic minority populations. The researchers' conducted a second study of a controlled trial from a sub-sample of the 159 participants to examine the clinical utility of a Semi-Structured Interview for Consideration of Ethnicity in Therapy Scale (SSICECTS). Results indicated that both semi-structured interviews improved evaluation ratings of interviewers, however the SSICECTS interviewers were perceived by interviewees as having more knowledge and respect of individuals' cultures. Being the only study to date that created tools to examine applicability of cultural issues to clinical practice, particularly in the treatment planning phase motivates the need for more studies, so

that results can generalize to additional clinical populations, such as families and juveniles in therapy.

Juveniles are important in their own treatment plans; however, much research has supported the importance of incorporating families into juveniles' treatment plan. Historically, adolescents were viewed as the one with the problem (Kumpfer, 1999). Conversely, an increasingly amount of researchers have recognized that the family may be the root of psychopathology in adolescents (Schwartz & Liddle, 2001). With the "focus on psychopathology as a symptom of maladaptive family functioning," researchers favor family-based treatments in the treatment of adolescent behavior problems (Schwartz & Liddle, 2001, Implications for treatment section, para. 5). Thus, the whole family should be treated since the symptom is rooted within family functioning.

In fact, major studies evidenced different outcome comparisons between individual therapy and family therapy. Szapocznik, Santisteban, Rio, and Perez-Vidal (1989) tested the effectiveness of structural family therapy to individual child psychodynamic therapy. Findings indicated that individual child psychodynamic therapy produced family functioning deteriorations at one year follow-up, whereas family therapy resulted in long term beneficial treatment outcomes. Borduin et al. (1995) contributed further evidence of family therapy superiority to individual therapy. For instance, they compared MST with individual focused adolescent therapy and found deteriorations in family relations. Thus, weakening family relations "is consistent with the systemic perspective that child misbehavior often serves a functional purpose (e.g. by uniting parents who are otherwise in conflict) in the family" (Curtis, Ronan, & Burduin, 2004, Discussion section, para. 2). Moreover, an unsupportive family can cause damage to the adolescent's treatment if the family does not believe in or understand the importance of the adolescent's treatment goals (Kumpfer, 1999).

Childhood experiences in the family play a major role in the development of CD. Main reasons for CD to develop and persist include: unstable family living conditions, an alcoholic caretaker (Schwartz & Liddle, 2001), interaction of difficult child temperament coupled with poor unskilled parenting styles (Conduct Problems Prevention Research Group, 2000), large family size (four or more), parents

rejecting children, single parenthood, maternal depression, inconsistent parental figures (exchanging parents to relatives to friends), socioeconomic status (Holmes, Slaughter, & Kashani, 2001), poor parental involvement and lack of supervision (Rutter, Giller, & Hagell, 1998). Three highly associated risk factors in the development of CD include parent psychopathology, divorce, and marital conflict (Keiley, 2002). With continuous dysfunctional family relations, conduct problems are likely to increase throughout development and into adolescence (Schwartz & Liddle, 2001).

Family protective factors prevent adolescent behavior problems. Loukas et al. identified two major protective factors for child conduct problems: the length of time parents and their children are together and the nature of parent-child interaction (Schwartz & Liddle, 2001). The U.S. Office of Juvenile Justice and Delinquency Prevention (OJJDP) (Kumpfer, 1999) found five significant family protective factors that prevent youth behavior problems: 1) caring parent-child relationships; 2) constructive discipline techniques; 3) monitoring and supervision; 4) family guidance for their children; 5) obtaining information and promotion to encourage their children. Family protective factors that improve positive adolescent behaviors are caring parent-child relationships, constructive discipline procedures, monitoring and supervision and communication of prosocial and positive family values and expectations (Kumpfer & Alvarado, 2003).

Juveniles and their families in therapy together are important, since youth behavior issues are a symptom of the family. Much research supports the notion that family involved in their child's treatment is beneficial. With continued family dysfunction, adolescent conduct disorders maintain, thus it is important to incorporate families in youth treatment planning and assessment. Moreover, juvenile ethnic minorities entering the juvenile justice system will rise. The 2006 National Report for the Department of Justice predicted from the year 2000 to 2020 juvenile offenders will be much higher for Hispanic (58%) and Asian (59%) compared to Native Americans (16%), black (9 percent), or white (7 percent) juveniles. In the future juvenile ethnic minorities and their families are more likely to be seen in mental health settings when referred. The therapeutic relationship between clients and clinicians is a key component to successful client treatment outcomes (Szapocznik, Hervis, & Schwartz, 2003). In fact, the client-clinician

relationship is a significant predictor of whether families will attend, remain in, and progress in therapy (Szapocznik et al., 2003), however cultural differences between clients and clinicians inhibits the therapeutic alliance. Moreover, acculturative stress that a family may experience significantly impacts the family. Effects of acculturative tension in families have been indirectly related to behavior problems experienced in Hispanic adolescents, as well as acculturation effects directly affecting the individual (Santisteban et al., 2003).

Thus, assessment will be applied to families and juveniles in therapy on the extent and manner to which they prefer their cultures to be delivered in therapy by administering CECTS. In addition, the SSICECTS will be utilized to measure the family's perception of the clinician's cultural competence of the family's ethnic culture. Higher Ethnic Culture Importance (ECI) scores will indicate greater endorsed importance of a family's ethnic culture, whereas higher Ethnic Culture Problems (ECP) scores will indicate greater experienced problems endorsed to the family's ethnic culture. Families that receive the SSICECTS are expected to view the interviewer as having more knowledge and respect of the family's ethnic culture. Results can be generalized to the large number of conduct disordered youth within the juvenile populations and their families, so that barriers that might otherwise inhibit the therapeutic relationship may be overcome. Proposed findings will have significant implications for therapists that work with juvenile offenders and their families.

METHODOLOGY

PARTICIPANTS

Participants will include 120 male and female juvenile delinquents (ages 12-17) and their families who consent to participate. The proposed study will take place at the Las Vegas Juvenile Justice Center, in the Psychological Services Department.

MEASURES

Consideration of Ethnic Culture in Therapy Scale (CECTS). The CECTS developed in Donohue's et al. (in press) study will be used. This scale is composed of six items that are evaluated using a 7-point Likert-type scale (i.e., 7=extremely agree, 4=unsure, 1=extremely disagree). The first scale measures the extent to which individuals perceive their ethnic culture important to them (Ethnic Cultural Importance, ECI). However, the variable "individuals" will be replaced with "families" in each item. Thus, instead of "my ethnic culture is a

big part of my everyday life" to "our ethnic culture is a big part of our family's everyday life." The first scale in Ethnic Cultural Importance (ECI) scale will include: our ethnic culture is a big part of our family's everyday life, our ethnic culture is of great importance to our family, there are many things that our family likes about our ethnic culture, our ethnic culture should be addressed in therapy. The second scale includes two items that assess problems viewed to be because of the family's ethnic culture (Ethnic Cultural Problems, ECP): others have said things to our family about our ethnic culture that has been offensive to us, our family has experienced problems due to our ethnic culture. Before querying ECP and ECI items families will be instructed to choose their ethnicity from the following items (i.e., African American, Hispanic, Native American, Asian American), that includes both "other" (e.g., Irish-American) and "multiple-ethnic" categories. The participants will be asked to answer all questions focusing on their cultural experiences with the chosen ethnic group. Scale scores will be added from item answers (i.e., ECI score range = 4 to 28; ECP range = 2 to 14). Higher ECI scores will indicate that families place greater emphasis on their ethnic culture, whereas higher ECP scores will indicate that families place a greater emphasis on problems due to their ethnic culture. Thus, Donohue et al. (in press) conclude that CECTS is pertinent to all ethnic groups.

Semi-Structured Interview for Consideration of Ethnic Culture in Therapy Scale (SSICECTS). Before the SSICECTS is administered family's answers to CECTS' items will be placed into either "agreement" (Likert-scale scores ranging from 5 to 7) or "disagreement/unsure" (scores ranging from 1 to 4) categories. For instance, if a juvenile interviewee and family "somewhat agreed" (i.e., score of 5) that their ethnic culture should be addressed in therapy, this item answer would be coded "agreement." After changing items of ECI and ECP, the interviewer will then administer a semi-structured interview. The interviewer initially will ask about ECI answers in the subsequent order: (1) our family's ethnic culture is a big part of our everyday life, (2) our family's ethnic culture is of great importance to us, (3) there are many things our family likes about our ethnic culture, (4) our family's ethnic culture should be addressed in therapy. "Agreement" and "disagreement/unsure" responses require distinctive prearranged sets of queries and statements. For all ECI scale items, if the interviewee chooses "agreement," the interviewer:

(a) relates that the juvenile and family interviewees articulated agreement with the item (e.g., "you all indicated that you agreed your family's ethnic culture is a big part of your lives"), (b) confirms that the item matter is important (e.g., "I think it's great that your family's ethnic culture is a big part of your lives"), (c) asks the juvenile and family to elaborate on the pertinent answer (e.g., "how is your family's ethnic culture a big part of your lives?"), and (d) maintains pleasant and positive conversation (i.e., demonstrates agreement, elicits additional specific information). If "disagreement" is specified by the juvenile and family for an ECI item, the interviewer: (a) discloses that the juvenile and family disagreed with the statement, (b) asks the juvenile and family why disagreement was endorsed (e.g., "how was it that your family came to not like many things about your family's ethnic culture?"), (c) expresses empathy/understanding after the explanation is provided (e.g., "other families have also told me it is hard to appreciate their ethnic cultural background when their families did not take them to cultural events"), (d) assesses if the family and juvenile was disappointed that disagreement was endorsed, (e) expresses empathy or understanding with interviewee's response (e.g., "I think that experience would make any family feel isolated from their ethnic background").

The interviewer then queries ECP responses in the following order: (1) others have said things about our family's ethnic culture that has been offensive to us, (2) We have experienced problems due to our ethnic culture. If "agreement" is indicated with the ECP item, the interviewer (a) discloses that the juvenile and family agreed others have made offensive comments about their family's ethnic culture, (b) reassures that others have also experienced similar comments, (c) asks the juvenile and family to explain how the remarks were offensive, (d) empathizes with expressed concerns, (e) asks how the offensive remarks affected the juvenile and family, and (f) either praises statements that suggest the juvenile and family have grown stronger because of the offensive remarks, or provides empathy for statements that suggest the juvenile and family were negatively affected by the offensive remarks. If "disagreement" is indicated with the ECP item the interviewer, (a) discloses that the juvenile and family indicated that they have not been offended by remarks about the family's ethnic culture, (b) asks if this is because others have not made remarks about the interviewees' family's ethnic culture that

could be determined offensive, or because the juvenile and family do not get offended, (c) praises the juvenile and family for not allowing others to offend them, or states that the juvenile and family have been fortunate to not come into contact with someone making such remarks.

Consideration of Exercise or Sports Participation in Therapy Scale (CESPTS). The CESPTS is entirely identical to CECTS (i.e., Consideration of Ethnic Culture in Therapy Scale), except that "exercise or sports participation" replaces "ethnic culture" in each item. For example, the first item reads, "exercise or sports participation is a big part of our everyday life," instead of, "our ethnic culture is a big part of our everyday life."

Semi-Structured Interview for Consideration of Exercise or Sport Participation in Therapy Scale (SSICESPTS). The SSICESPTS is entirely identical to SSICECTS, with the exception that "exercise or sports participation" replaces "ethnic culture" in all prearranged explorations and statements. For instance, asking how "exercise or sports participation" is a big part of the juvenile and their family's lives instead of asking how "ethnic culture" is a big part of their lives.

Consumer Satisfaction Questionnaire. For the consumer satisfaction questionnaire, participants will rate interviewer impressions of interviewers by rating their level of agreement or disagreement with 8 statements, utilizing a 7-point Likert-type response format (1 = extremely disagree, 7 = extremely agree). Statements will comprise of: (a) degree of familiarity with interviewees' ethnic culture, (b) degree of respect for the interviewees' ethnic culture, (c) degree of trust, (d) interviewing skills, and (f) likeability, as well as the interviewees' (g) level of comfort with the interviewer, (h) likelihood of referring a family of the same, and (h) different, ethnic background to the interviewer. Interviewee satisfaction is noted by Donohue et al. (in press) as a set procedure for assessing clinical utility of assessment tools. Consequently, a 7-point scale of agreement (1=extremely disagree, 4= unsure, 7 = extremely agree), juvenile and their family interviewees will be told to indicate the degree of satisfaction with interviewers procedure of assessment to CECTS items (e.g., "We were pleased with the way the interviewer attempted to understand how our family's ethnic culture is important to our family," "We were pleased with the way the interviewer attempted to understand how people may have offended our family

due to our ethnic culture").

PROCEDURE

Juveniles and their families will be assigned to an interview room. Trained interviewers will be randomly assigned to interview rooms. Interviewers will be introduced by research assistants and then left alone to conduct a structured interview with participants. The interview will consist of demographic questions so that an impression of the interviewer will be formed. After the interview, the interviewer will leave the room and the research assistant will administer a short questionnaire designed to evaluate the interviewer. The participants will be told that the interviewer will not see the questionnaire and place it in an envelope in front of the participant. Then families will be randomly assigned to receive one of two semi-structured interview formats (Semi-Structured Interview for Consideration of Ethnicity in Therapy Scale, SSICECTS or the Semi-Structured Interview for Consideration of Exercise or Sport Participation in Therapy Scale, SSICESPTS). Interviewers will return to their assigned rooms and administer the relevant semi-structured interviews.

After all semi-structured interview are administered, each interviewer will leave the room. The research assistant will return to re-administer the previously mentioned evaluation questionnaire, again disclosing that all responses would be confidential. Participants who were administered the SSICECTS will be additionally instructed to complete a consumer satisfaction questionnaire, aimed at assessing their satisfaction with the manner by which they were queried about their responses to the CECTS.

RESULTS

This study has yet to take place after IRB submission is completed, so there will be proposed descriptions of collection and evaluation of data. A principal components factor analysis with varimax rotation on CECTS will be performed so that items on factor 1 are evaluated to assess the extent that the family's ethnic culture is perceived to be important to the family. In addition, staff will evaluate items on factor 2 to assess the extent to which problems experienced by the family have been due to the family's ethnicity. Research will derive internal consistency of CECTS for all item scores on this scale, to evaluate the relationship of CECTS subscales. If the family perceived their ethnic culture important then they will be more likely to view

problems from their ethnic culture. To decide ethnic groups that may benefit most from CECTS, an Analysis of Variance (ANOVA; 2-tailed) will be performed so that findings can compare the various ethnic groups scores from the Ethnic Cultural Importance (ECI) subscale and the Ethnic Cultural Problems (ECP) subscales of CECTS. To determine which ethnic groups differed, subsequent planned comparisons utilizing ethnicity as the independent variable will be studied, and ECI and ECP scores as dependent variables. Research staff will conduct Two-tailed Chi-square tests on the ethnicity and gender of the interviewer, with type of semi-structured interview format serving as the independent variable, so that interviewer ethnicity and gender do not perplex study results.

The considered study presents evaluations of participants' demographic comparability for both semi-structured interview conditions. A succession of two-tailed independent sample t-tests will be performed on the dependent variables (i.e. age, number of hours of athletic and ethnic cultural activities in the past month), with the respective semi-structure interview as the independent variable. Moreover, researchers will conduct a two-tailed Chi-square test on ethnicity and gender of interviewees with the particular interview received. Research staff will utilize protocol checklists to attain reliability and validity for both semi-structured interviews. Interviewers will check whether or not the protocol adherence occurred. Trained raters will listen to tapes of random interviews and will be evaluated. Interviewers list will be compared with raters list to obtain reliability, however, validity will be determined solely by interviewer lists. Interviewer performance will be assessed through the interview format and interviewees' ratings of interviewers' performance. Multivariate Analysis of Co-Variance test (MANCOVA) will be utilized to assess each semi-structure interview (i.e., SSICECTS, SSICESPTS). The interviews will serve as the independent variable, while the dependent variables will be interviewees' ratings of interviewers before and after conducting the semi-structured interview. Staff will evaluate the means and standard deviations of interviewee ratings of the extent to which families are pleased with the method of SSICECTS content.

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AGEISM IN THE ENTERTAINMENT INDUSTRY: SHORT AND LONG TERM EFFECTS ON PERFORMING ARTS EDUCATION AND SOCIETY

BY KATHLEEN BELL



ABSTRACT

This research analyzes aspects of ageism as they relate to the entertainment industry and to performing arts education, film and theatre in particular. I will explore probable roots of ageist stereotypes and discriminative practices in the industry. Do our stereotypes of age relevant marketability impact how our colleges and universities prepare students, regardless of age, for careers in this cosmetically driven industry? If so, how does that impact the type and quality of education performing arts students, regardless of age, are receiving within their disciplines at colleges and universities? Will outdated models of ageing continue to perpetrate negative myths and stereotypes that portray older adults as just steps away from a lack of value to society overall? Will women ever be marketable and allowed to age gracefully?

INTRODUCTION

Ageism has been addressed in many forums and on numerous platforms. One such occasion was held before the 45 members of The U.S. House of Representatives Select Committee On Aging, on April 26, 1980, in Los Angeles, California with its focus: Media Portrayal Of The Elderly. Several dozen witnesses, from the Screen Actors Guild, along with producers and writers, testified before this esteemed committee. Most expressed how they and many of their peers had been directly affected by ageist practices and attitudes. Florida's Democratic Congressman Claude Pepper served as Chairman of the committee.

Pepper proclaimed in his opening statement:

Negative stereotyping robs the elderly of their dignity, their sense of self-respect, their self-worth, their feeling of being wanted and needed. Negative characterizations of the aged of America as unemployable, senile, infirm, myopic, deaf, constipated, toothless, asexual, and generally worthless provide younger people with poor role models. Elderly people generally are just not like that (United States Congress Select Committee on Aging 1).

Dr. George Gerbner, Dean, Annenberg School Of Communications, University Of Pennsylvania, presented to the 1980 committee a two-part, ten-year study. A yearly sample of television programming presented worldwide was used as its base. Gerbner researched; "particularly, the way in which they represent aging and what effects" they have on audiences of every age (6). [It is a] "process that starts with birth and goes on throughout life" (Gerbner 6). How to age is learned during youth and throughout each cycle and stage of life. It has more to do with behaviorisms learned within our cultures and via "role modeling" than any mental or physical pre-terminations. People will often emulate these images as they age. It is a type of preconditioning that one may not want, find healthy or of value (United States Congress Select Committee on Aging 6).

According to Gerbner's study, the more one watches television the more embedded negative images become. The "personal characteristics" of older people that the public sees on the screen is an image that is "less healthy declining in age-longevity not active sexually [and] not good at getting things done, and so on" reported Gerbner (11). It especially has an effect on the youthful viewers. Gerbner's research found that the media is "telling younger people that old age, especially for women, begins relatively early in life" (11). Gerbner claims "there is a positive correlation between amount of viewing and fixing the onset of old age earlier in life" (11). The study revealed that heavy viewing habits can contribute to one believing that "old age begins at 55, sometimes even 50" (United States Congress Select Committee on Aging 11).

Gerbner's findings noted that television and the media do not present a true picture of society. Usually, viewers only see women between twenty and thirty years of age because purportedly, the females age faster. Unlike men, a female's visibility and usefulness drops as her age rises. Another marked inequity in the television medium is that it "provide[s] a relative abundance of younger women for older men but, no such abundance of younger men for older women," Gerbner observed (9). In their world, men are more numerous than women by a 3-1 ratio. Concerned, Gerbner revealed that the representative worlds are out of balance and not natural, explaining, "men-which usually means masculine values: action revolving around power, rather than other things-dominate" (United States Congress Select Committee on Aging 7, 9)

Nancy Culp, best known for her television role of secretary "Jane Hathaway" in the 1960's sitcom, "The Beverly Hillbillies," also testified stating:

Knowing as we do the tremendous impact television has in formulating doctrines, ideas and social mores, one can only suggest that if television is ever to come of age, it must recognize and reflect the intrinsic value of all ages. [Casting women aside once they turn 40-plus is] creating a polarization of a powerful and benevolent force in a violent world. [It is a] time of desolation and almost total oblivion for despite her talent, experience, adult richness inherent in the older woman, the roles simply are not there (United States Congress Select Committee on Aging 31).

In American television, aging women are a vanishing

breed. Culp reasoned that mature women are "a viable, productive, interesting part of the human spectrum," and their "strength and dimension" should be weaved into the industry as they are the hub of life (United States Congress Select Committee on Aging 31).

Male actors like Jack Albertson also gave evidence and have concerns as well. He said that the decision makers seem to, "assume that the emotions fade as years pass, or that love and laughter are only for the young" (United States Congress Select Committee on Aging 17).

The kinds of role modeling and images that the television and film decision makers continue to present are still a matter of ongoing concern. Dr. Gordon Berry, Professor at UCLA Graduate School of Education, Educational Psychology Division spoke before the White House Conference on Aging, Entertainment Industry Mini-Conference in 1995, regarding these stereotypical assumptions. Berry noted that they depict "infirm, poor, lonely, and out of touch with present reality" older persons (7). The "negative expectations, fear, and a dread of aging in younger generations" is created by these images (Berry 7). The underdeveloped and one-dimensional older characters portrayed on television and in film historically are not given a past. Hence, there is no justification or clarification for who they are within the script. Berry asserts that they are merely caricatures, undeveloped characters not seen in the full sense. Berry continued, "Women often suffer most from these portrayals," referring to the inclination of casting directors to typecast them (White House Conference 7).

Although progress is slow and character portrayal of older people is often still behind the times, films such as director Donald Petrie's *Grumpy Old Men*, defy the stereotype. Petrie served on the panel of the mini-conference as one of the moderators. The attendees of the conference lauded Petri who said:

[His film served to] neutralize the stigma placed on aging by making the point that it is a person's character, not age, that matters most. [With the] gradual aging of the viewing audience the entertainment industry can again take a leading role by moving away from films and programs that celebrate and fantasize youth, and by promoting those that celebrate the accomplishments and opportunities of adulthood (White House Conference 10).

Marketing power brokers choose to focus on the 18-34 year-olds because they are the primary moviegoers. These brokers are usually younger and relate to their peers "values and preferences" rather than those of an "older market" (White House Conference 13).

Actors continue to carry the banner, speaking out about the sexist and ageist practices. On September 4, 2002, a Hearing was conducted in Washington, DC, before the United States Senate Special Committee on Aging. The Chairman, Senator John Breaux admonished media, marketing, and entertainment industries for their ageist and sexist practices. Breaux spoke of the pairing of "60 something leading men" with females who are "20 something leading ladies." In their "quest to target youth" (Breaux 1) marketers callously and distastefully ridicule older people in order to sell something. Breaux added, "75 percent of older consumers are dissatisfied with the marketing efforts that are directed at them" (1). As a result, many of these potential customers now refuse to purchase items marketed to them in a negative or stereotypical manner. Breaux condemned the industry for disregarding the "purchasing power and preferences of millions of American baby boomers and seniors across the country" (Special Committee on Aging 1).

While these seniors, 65 plus, "control about three-fourths of the wealth of our nation" and "comprise 13 percent of the U.S. population," statistics regarding their representation on "prime time television is a disturbing 2 percent" Breaux remarked (2). This 2 percent population on prime time is the exact same statistic found in the Gerbner report in 1980. Breaux believes that many of the hardships "faced" by mature Americans are "rooted" in the lack of value, or respect our society has for them. He said, "Now is the time to embrace aging and recognize the ways in which Americans of all ages are redefining aging and working to eliminate ageism and discrimination" (Breaux 2). Many mainstream Americans are doing just that and campaigning for rightful representation of mature people (Special Committee on Aging 2).

One of these advocates was the first witness introduced to testify before the committee.

Emmy Award winning actress Doris Roberts of the television sitcom, "Everybody Loves Raymond," wowed the committee with her analysis of the state of the entertainment industry and our society when she said:

Society considers me discardable. Seniors are self-

sufficient middle-class consumers with more assets than most young people and the time and talent to offer society. Age discrimination negates the value of wisdom and experience, robs us of our dignity and denies us the chance to continue to grow, to flourish, and to become all that we are capable of being. [It is the] disabling myths that disempower us. The average age of the Nobel Prize winner is 65 (Special Committee on Aging 3).

Many celebrated and cutting edge scientist and artists do not peak until later in life. To prove her point Roberts began enumerating just a few of those notables: "Hitchcock, Dickens, Bernstein, Fosse, Wright, Matisse, Picasso and Einstein." She made the observation that they made their greatest advances at a time when our current society would consider them "over the hill" (Special Committee on Aging 3).

Warming to the subject, Roberts emphatically stated, "The entertainment industry, these image makers, are the worst perpetrators of this bigotry." She points out that 20-year-old actresses get "Botox injections" and frequent "plastic surgeons" to offset the onset of wrinkles. Roberts declared that "Face lifts" and "tummy tucks" are the fortresses used to "forestall the day when the phone stops ringing"(4). According to Roberts, older actresses are too often offered roles that portray them in an "insulting and degrading way" (Special Committee on Aging 4).

The industry does not relegate its ageist practices to actors alone. Roberts talked about a project she had developed with an Emmy Award winning writer/producer. The co-creator refused to accompany her when she went to the studio to pitch the project. Fearing the project would be finished if they saw his gray hair. Another project was axed. The "producer / writer attached to the project was a women in her fifties" (Roberts 4). Roberts was amazed that the industry acts as though mature aging adults do not "have anything to say about love or youth or relationships" (Special Committee on Aging 4). In her closing, Roberts explained:

I mean 20 years ago, it was accurate to show a senior coming in for a check-up dragging his oxygen tank. Today, he would be dragging his golf clubs. We older people control 77 percent of the country's disposable income, yet the entertainment industry has made age something to be feared. It is a small comfort to know that those who have perpetrated ageism will soon face it themselves. [Hollywood is] clueless and blind

regarding their [boomers] health and personal income (Special Committee on Aging 5).

I wondered why the entertainment industry and its marketing machine continue to ignore the enormous potential of the boomers. I understand that first and foremost it is a business and the bottom line prevails. I contacted Mr. Paul Kleyman, who had also testified before the 2002 Special Committee on Aging. He is the national coordinator of the *Journalists Exchange on Aging* (JEoA) and editor of *Ageing Today*. In an e-mail interview, Kleyman explained to me some of the reasons behind the industry's policies and attitudes. The entertainment industry has thrust upon its viewers a negative and stereotypical model of aging people that is discriminatory. I asked Kleyman why he thinks this inappropriate practice in the media seems to be an unending battle and he candidly explained:

Ageism in the media is not merely a matter of individual attitudes but stems from outmoded economic models that perpetuate age discrimination both in front of and behind the camera, microphone and news desk. The media bases their financial models on targeting the 18-49-age bracket. This practice can directly lead to limited coverage of news, issues and perspectives needed by citizens in an aging society (Kleyman, 2007).

As we see fewer mature people employed as on-air news sources or in leading dramatic roles, one must understand that this is a reflection of what may be occurring behind the scenes as well. Kleyman says, "writers, reporters, directors and so on, people who have the experience necessary to bring a mature life perspective into reports and scripts" are not being given that opportunity. Kleyman mentioned that the cable network TV Land conducted a national survey of viewers' aged 50 plus. According to Kleyman the study disclosed that the boomer generation is very unhappy about its marginal depiction in entertainment programming. Today's writers of TV programs fail to reflect their phase of life. Catering to the 18-49 year-old viewers has boxed the industry into a market of diminishing returns. Kleyman pointed out that mass media is not taking advantage of the power of "their richest and most loyal market -- 77 million aging boomers."

Comparing mass media to the US auto industry a calcified institution, Kleyman says they are, "locked into old economic models." Advertisers believe that if

their products brand name is ingrained into youngster's minds it will last a lifetime. Another unproven notion that the promoters adhere to is that mature adults are stuck in their ways and that they will not experiment with new products. The entertainment industry needs to "adapt to a changing environment," warns Kleyman. He says the "competitive new media" may be a source the boomers will turn to and it is already "siphoning off customary sources of revenue." As to whether these entrepreneurs pick up and run with the boomer market, Kleyman predicts, "It's coming but no one is quite sure from where at this point" (Kleyman, 2007).

There is a lot of talk about the need for change in Hollywood. Highlighted in the Summer 2007 issue of *Screen Actor* was an article that addressed the issue of "ageism in the industry." The article, "Party of 5, Straight Talk on the Challenges and Triumphs of Aging in Hollywood," was based on a roundtable discussion with veteran actors Doris Roberts, Lorraine Toussaint, Robert Falk, William Schallert, and Regina Taylor. Each actor agreed that the issue of age hits women the hardest. Toussaint agrees that older people are underrepresented in the media. She says, "We want to turn on the tube and go to the movies and see vibrant, sexy, alive people that are our age" (Toussaint 23). She mentioned a real mandate that filtered down the ranks from the studio heads that dictated policy for the pilot season two years prior, no one over 35. Peter Falk confessed that he hasn't worked in 15 years. William Shallert works in voice-overs when older parts aren't available. He does not think he has experienced ageism (Party 23, 24).

Golden Globe-winning actress Kyra Sedgwick portrays a benevolent force in the violent world of *The Closer*. Starring in a popular television program has done little to assuage the 42-year-old actor's concerns regarding aging. In an article for *Skylights Magazine*, written by Tom Johnson and David Fantle, Sedgwick expressed her stand: "I will fight ageism in Hollywood to the depths. It definitely exists" (26). According to the article, Sedgwick wages a continuous battle on two fronts. One is to find parts that have value and the other is in overcoming a firmly embedded, institutionalized ageism that exists in Tinseltown (Johnson & Fantle, 2007).

Through a series of interviews conducted with educators and students of the University of Nevada Las Vegas (UNLV), I got other perspectives on the issues of ageism. Most of the people I interviewed agreed

that ageism is a problem in our society. Dr. Ann McDonough, Dean of University Studies at UNLV and co-founder of the Senior Theatre Program spoke candidly about the subject: "I think that historically there are negative myths about aging that are pervasive in the media." Citing MTV and VH1, she believes negative "biases toward later life" are "reinforced" at times. McDonough feels that UNLV is helping to inspire people to age positively by offering the Senior Adult Acting Program. The program is a national leader and universities across the country are emulating the model. Like a proud parent, she bragged that this innovative program has been featured on the *NBC Nightly News*, *the Today Show*, and in *Time Magazine*.

According to Jeffrey Koep, PhD and Dean of the College of Fine Arts at UNLV, "society forms the stereotypes" and the industry simply "reinforces" those stereotypes of young and old people alike. Koep asserts that ageism is "not necessarily from film and television." He believes it is from today's youths "lack of interaction with those [older] people." The Senior Adult Acting Program was initially Koep's idea at UNLV and he brought McDonough on staff to actualize his vision. Koep thinks most in academia "embrace" the idea of the "boomers" returning to school. Koep says, "special pathways" are always being considered to help "integrate them into the programs." He is especially enthusiastic about helping returning adults "follow through with their dreams of getting an education."

Confiding his fondness for the talents of the mature acting students as well, Dr. Charles O'Connor, Chair and Executive Director of the Department of Theatre, Nevada Conservatory Theatre (NCT), clarified his reason. He states, "The older you are the more experience you have, the broader your range." He is especially appreciative that the theatre, art and music departments do not have to contend with marketing influences or pressures like film and television do. The sponsors of the NCT "rarely get involved in the artistic part," he said.

Professor Bob Brewer, Artistic Director of the NCT believes that boomers, a very large audience base is forcing a kind of introspection and a real serious exploration of the challenges of aging in today's world. The idea of "Senior Theatre classes and non-senior theatre classes is somewhat problematic," in his opinion. He would like to see older and younger theatre students integrate more. Brewer is intent upon "developing a theatre that is going to attract a

diverse audience both old and young."

Professor Doug Hill is the Associate Director of the Senior Adult Theatre and Director of the Outreach Touring Program. He encounters a certain degree of ageism in his search for new scripts, productions and monologues that are age and subject appropriate for, as he fondly refers to them, "his seniors," to work on. Hill says his students prefer scripts about interpersonal relationships, "September sex, courtships, or starting over again." Hill suggests to playwright candidates in the Master of Fine Arts (MFA) program to, "Create a play about 30 year-olds that your buddy actors would like to be in; then simply switch the age range after the first draft."

Mature adult students, "do their homework, read, think, talk, discuss, ask and raise questions in class." Asserts Linda McCollum. She is the NCT Publicist and Company Manager, Coordinator of the National Stage Combat Workshop for UNLV and teaches Theatre History as well. McCollum "loves having older students in her classes." She feels that many younger students just want "the answers so that they can pass and get an A. It's a whole different attitude there." Additionally, Shannon Sumpter is Manager, Coordinator and Director for the student Theatre and NCT programs. She states that the entertainment industry needs to change the images it portrays of older people. Sumpter is "pleasantly surprised at how diverse college communities are now. This will make our society better off because society is diversity." Unfortunately, its positive effects only reach a minority of people. "College is still not something that 90% of the young people go to," she said.

Film Department Chair, Professor Francisco Menendez touts that business viewpoints and principles must be considered first and foremost when it comes to filmmaking. The age demographic, 18-49 year-olds, are the biggest movie theatre attendees and buy products that are associated with the films. The market and industry is going to concentrate their efforts on the most profitable margins. Stereotyping he explained, comes from "stock types" that are a hand-me-down from theatre and every age group is painted with the same brush, especially in comedy. The British Cinema "does older women films in much more regularity" than American filmmakers he said, "they sort of fill in that gap." Like products, actors are branded. Menendez says that aside from some of the stars from the 1970-decade, "There is nobody supposedly over the age of 40 who is a branded recog-

nizable star." In the university setting, Menendez says a bigger more important question than ageism would be, "Is there a job opportunity out there for them [older students] and are we training them for that?"

Director of numerous films, Professor David Schmoeller has a more optimistic viewpoint regarding the ageist practices of Hollywood. He believes that a more positive trend is on the horizon for the mature audiences. The movie industry is breaking into smaller segments. They now have to niche market their products. He believes the industry will turn to older people like the financial industries currently have because of retirement. We are seeing more mature faces in commercials now. Schmoeller feels that older students are often the "better student due to the maturity factor, and they are always a great asset on the set." Head of film editing, Professor George Wang contends, "The entertainment industry has a responsibility to eliminate any negative perceptions it has imposed upon any particular group of people." He admits that investors and studios prefer to steer products toward the youth, their largest "viewership base." Wang says that here at UNLV "the instructors should utilize film scripts that more honestly depict the composition of our society." Film students often work in groups and the younger students are more likely to form groups with peers of similar age. "In smaller classes, instructors can take a few extra steps to ensure all students are familiar with their classmates to create a more harmonious learning environment for everybody" suggests Wang.

Professor Dale Melgaard, film language, genre and history instructor tries to instill in his first year students a sense of dual responsibility. One must understand, he says, "The box office rules, and film is a business first and an art form by default." Film is a tool that can be used for manipulation. With this in mind, he challenges his students to not only entertain and inform their future audiences, but to see if they can make the world a better place through their films. He piques the students' creativity by reminding them, "Films that last the longest are those that resonate truth and have social value."

My mentor Professor Michael Tylo is an accomplished professional film, television and stage actor. He says, "In the last 20-40 years, the entertainment industry has dropped their mature audience, gravitating toward younger programming." This trend has left the current 77 million mature adults, who have

been labeled "boomers" behind. The American culture, unlike most others, seems to throw out their older people and fails to show their elders much respect. He says, "Mature people have a wealth of information to share and good working habits." Tylo sees the influx of aging adults, who are infiltrating the colleges and universities, as an opportunity for the generations to gain respect and an appreciation of one another. As a liaison between the theatre and film departments, he tries to ensure that there is age appropriate material available for all. Tylo claims, "Academia should make accommodations to embrace all students, giving each the opportunity to develop and polish their skills and talents through trial and error. Both failure and success are part of learning."

Not all the young students I interviewed agreed about the abilities of older students or their place in Universities. Some contradicted themselves by adhering to stereotyping older people and then marveling at their wealth of knowledge and adeptness. Others found it difficult to view them as peers. But most felt encouraged by their presence and tenacity. The older students said their skills and life experiences were often dismissed and under appreciated. They expressed a wish for more opportunities, respect and real trust in their talents.

This research uncovered twenty-seven years of query into the subject of ageism. Twenty-seven years of people asking for their due respect and a true and equal representation in the entertainment industry. In 1980, Dr. Gerbner's research revealed the negative impacts that the viewing of these false worlds could have on our society. We were warned, yet fifteen years later in the White House Entertainment Industry Mini-Conference, it was concluded that a "balanced view of aging" would not be presented to the viewing public until we "confront the stereotype that youth is the best part of life and that everything after youth is simply a longing to regain youth (Images 15). The false worlds created a foothold in our American culture. In 2002, the Special Committee on Aging was formed. The young adults referred to in the 1980's study are the boomers of today who are dealing with those same problems and issues. Very little progress has been made beyond the continued awareness and compound evidence of the ageist and discriminatory practices of the entertainment industry. Culture has been turned inside out and reverses the youths and discard its wizened ones like worn out shoes.

Mr. Kleyman pointed out that the marketing of the entertainment industry is built on out-dated and redundant models. It may be too late for this generation to rectify all of the inherent issues of ageism. What can be done is support and laude markets that paint accurate and positive images of our society and all the generations.

The Gerontology and Senior Adult Theatre programs at UNLV are lauded as one of the most progressive in the nation. As a leader, our educators must strive to send the message to our youths that their very futures depend on finding a lasting remedy that will be a win-win for everyone. It is imperative to move beyond the studies and to take action now. UNLV has the opportunity to commingle the generations and vanguard a new model of marketable talents that trust one another. Here in the Silver State, the sparkling example UNLV sets, reflects their Rebel determination. The fight against any form of ageism, stereotyping, or prejudice in education, society, or the entertainment industry that mirrors it must continue.

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SOCIAL AND PSYCHOLOGICAL EFFECTS OF WESTERN CULTURE

BY CHERYL R. COLEMAN



INTRODUCTION

Racism continues to be rampant in the United States. Although in direct opposition to the values espoused by Christians, Western cultural values around race have arguably influenced individuals in the Christian community. The overarching goal of this study is to examine the interaction of race, Christian values, individual purpose and identity, and Western culture in the experience of Black Christians.

CHRISTIANITY AND RELIGIOUS AFFILIATION

Religious affiliation is often the most important defining factor to an individual's sense of identity and perceived life purpose. In its original intent, Christianity adheres to the doctrine that individuals are saved from the penalties of sin, by a heart-felt, unwavering belief in Jesus Christ, and in the fact that he was the son of God, raised from the dead to save human sin (Romans 10:9) (New King James Version). Through this belief, individuals receive new life: through the God of the Bible, individuals live their lives according to the scriptures by working "out your [their] own salvation with fear and trembling (Phil 2:12)... for it is God who works in you [them] both to will and to do for His good pleasure" (Phil. 2:13). In other words, through their expression of faith, Christians become "born again" such that they perceive life in new ways as God reveals Himself through the pages of biblical scriptures (John 3:6). Born again identity is ultimately an

expression of love and care for one another (1 John 3:23, 1 John 4:12); and it is further expressed through identification with Jesus Christ (Luke 9:26), and everyone who declares Christianity as a religious conviction.

The goal of the Christian is to ultimately come to place of spiritual maturity, which is in alignment with the God of, and the teachings of the Bible, that emulates Jesus Christ (Romans 8:28, 29). Christianity is further defined as a single entity which can be likened to the human body, with many different parts, each having specific gifts and talents, to be expressed by a particular purpose or function (1 Corinthians 12:12).

The ways in which Christians' perceive life and understand their identity as Christians occurs, in part, by determining their purpose for living through internal, rather than external factors. Through the internalization of biblical methods of knowing ones purpose, such as establishing a personal daily relationship with God through prayer, fellowship with other Christians, and through studying scriptures, Christians believe they are guided through life by God. For example, the internal relationship with God allows them to see their purpose in life, (e.g., choosing a specific vocational path), view oneself as a member of a group, and strive for human equity (Romans 12: 1-3; Gal. 6:10).

This individual purpose of Christians has both spiritual and practical utility. Having been given life by God, Christians often view their life purpose as unique, for the overreaching purpose of supporting others (1 Cor. 12:7). Jesus Christ, was a carpenter (serving practical need) (Mat. 13:55), and the builder of the Church (serving spiritual need) (Mat. 16:18). Interactions among Christians have a direct correlation with the individual purpose of the Christian within any culture. Christianity as an entity transcends every culture and functions as a collective unit, having the same care for one another as an organizational goal (1 Corinthians 12:25): they are comprised of individuals from "every kindred, and tongue, and people, and nation" (Rev. 5:9).

The church is one primary outlet whereby Christians practice their faith through the teaching of the Bible. The church building is an outlet for Christians to practice the Christian faith through encouraging one another in psalms, hymns and spiritual songs and singing to God with thanks in their hearts (Col. 3:16), as well as, among other things, instruction on how to live a biblical Christian lifestyle. Although, the Church is not confined to a church building, but rather it describes those who participate in the Christian faith.

LITERATURE REVIEW

WESTERN CULTURE AND CHRISTIANITY

Despite the overarching beliefs of Christianity as a religion, the Christian church is an institution that was created by the ideals of Christianity and exists in a cultural context.

Culture is a broad term that describes, "the values, beliefs, behavior, and material objects that together form a people's way of life" (Marger, 2006, p. 6). From a social perspective, culture influences customs, norms, practices, and social institutions, including psychological processes (e.g., language, caretaking practices, media, educational systems) and organizations (media, educational systems, churches) (American Psychological Association [APA], 2003). Embedded in the definition is the acknowledgement that culture is not a distant general context under which individual development occurs but rather, it directly influences human development, identity, and interaction. *Western culture*, also referred to as *Euro-American* or *White culture*, broadly refers to first-world, economically stable cultures, such as the majority culture in the United States, that value individualism, competition, rational thinking and deci-

sion making, economic displays of status and power, and a patriarchal family structure (Katz, 1985).

American culture materialized in 1776, on the premise of *E Pluribus Unum*, meaning "From Many, One." The Founding Fathers referred to this phrase to indicate unity among the thirteen colonies into one country (O'Reilly, 2006). This phrase was written to express an inclusionary attitude that welcomed immigrants from across the globe who brought their talents and desire for freedom to the United States. This diverse group of individuals from multiple nations, backgrounds, and cultures created the American dream by actively choosing to live in a country that aspired to provide the freedom necessary for all to accomplish their desired goals and live the lives they desired (O'Reilly, 2006).

However, mainstream American culture is not idealistically fair in reality. Although it is acknowledged that individuals embody specific gifts, talents, and abilities to contribute to it, despite their skin color, or cultural practices, there are great disparities in the free enterprise system. With regard to race, the mainstream American cultural climate reveals significant racial disparities with regard to income, health care, and general treatment, to name a few areas, with Whites benefiting more-so than other racial groups. For example, one of the most visible consequences of [White] privilege is the "uneven distribution of jobs, wealth, and income and all that goes with it, from decent housing and good schools to adequate health care" (Johnson, 2006).

When society's resources are scarce (e.g., jobs, housing), social networks, human equity, and quality education remain more easily accessible by those who are White, whether they are Christian, or non-Christian. The distribution of these resources therefore, takes the form of preferential treatment among those who are White in hiring and promotion in skilled and unskilled labor, upper level blue-collar positions, access to unions or government, and subsidized mortgages (Johnson, 2006). Not only is special access provided to Whites, but this process is developed, and proliferates within Western culture, at the expense of non-Whites.

THE IMPORTANCE OF RACE

Race is generally defined as the socially constructed characterization of individuals typically based on visible traits (e.g., skin color, facial features, hair color

and texture, stature), and culture of origin (Phinney, 1996; Katz, 1985). Race and the process of identifying as a member of a racial group is the process by which social, economic, and political forces determine the content and importance of social categories, and by which they are in turn shaped by racial meanings (Omi and Winnant, 1994). Though many studies have been done by biologists, geneticists, physical anthropologists, and physiologists, there is no scientific evidence that supports the distinction of one race from another. In fact, evidence supports that the genetic make-up of humans reveals that there is more within-group genetic variability in human's biology than between-group, meaning that there are more differences among Whites than between Whites and other groups (Marks, 1995).

The social meaning of race is constantly subject to change through political struggle" (Marger, 2006 p.22). This notion is clearly exemplified during 19th century politics, when European immigrants (who had previously been despised by Americans), were heavily courted by politicians in order to gain political leverage (Williamson, 1976). Europeans had their first encounter with peoples from Africa, and the Americas during the Age of Discovery in the fifteenth century (Marger, 2006). The Europeans' initial encounter with non-whites was through conquering and seizing their land, and then subjecting the inhabitants of the land to enslavement or colonial repression. This was not justified only because of the color of their skin however, but specifically because they held non-Christian beliefs and practices (Benedict, 1959; Fredrickson, 2002).

As racial tensions heightened, pseudo-scientific beliefs of race began to arise through the field of academia, and in particular from the concept of the origin of the human species which rendered the social meaning of non-whites as being inferior to Whites. This concept was derived exclusively from studies of animals reported on by Charles Darwin in his 1859 publication, *The Origin of the Species* (Marger, 2006).

Ethnicity, a construct closely tied to race, is defined as one's unique cultural identity. (Marger, 2006, p. 24). Ethnicity is also a social construct which is shaped over time in relation to the choices the groups members make (Phinney & Ong, 2007). From this framework, Christianity itself can, like any other ethnic group, be construed also as an

ethnic group, whose members make choices to adhere to biblical principles and precepts, likely as a sub-culture, within the larger cultural scheme. However, in Western culture, one's primary group identity is defined by their socially constructed racial and/or ethnic status and not by their religious affiliation.

INTERACTION OF CHRISTIANITY, WESTERN CULTURE, AND RACE

Race relations, culture, and religion have a long history of being inter-related. In the early fifteenth century, Europeans began deliberately seeking out new land to inhabit. In addition to their desire to find other Christians with whom they could align themselves against Muslims, and make more Christian disciples through the spread of Christianity, Christians also sought to expand European power through the process of exploration, conquer, and colonization (Hine, Hine, & Harrold, 2006). When Europeans began settling in North America, indentured servants settled with them. Indentured servants were men and women with various phenotypical features from Europe, Africa, and North America as well (Hine et al., 2006).

Slavery was commonly practiced among many civilizations, but the harshest and most cruel form of slavery began in 1510 when slavery would begin to be based upon one's phenotypic racial characteristics. Africans were henceforth relegated to the role of domestic servant hood, and became the personal property of their owners with no rights as human beings. During the seventeenth century, it became a legal practice to include that the children of slaves would also be servants for life. (Hine, et al., 2006). By 1840, the belief was that anyone who was not a White Anglo Saxon Protestant, was permanently and innately inferior culturally, physically, economically, politically, and intellectually (Hine, et al., 2006). To be inferior was to be anyone who was not a native-born Protestant. In the Christian church, Blacks were still only recognized as slaves. As noted by Carter, "in order to keep the slaves ignorant and therefore contented with slavery, the slaveholders would allow among the slaves, "no teachings, religious or otherwise, which would make them dissatisfied with their [slave] status" (1926, p. 1).

During the late eighteenth, and early nineteenth centuries, however, Blacks had begun to be exposed to the Christian religion, but only as second - class

citizens. Within biracial congregations, Blacks would be subjected to separate Black congregations by race such that separate seating and communion services, separate Sunday schools and separate cemeteries from Whites. When a Black parishioner attempted to pray in the White section of the church, attempts to prevent him were made by White trustees (Hine et al., 2006). This action led to the first official disunion of the church in America that was negatively driven by race, with the formation of the first Black independent church (Hine et al., 2006). In fact, after slavery formally ended, negative sentiment among Whites toward integration in the church remained.

According to Carter, (1926), "There is no reason to think that a war which was fought to free these slaves, and which was bitterly denounced by these same [White preachers and churches when it resulted in freeing the slaves, would change the opinion concerning the racial superiority of the whites and the racial inferiority of the blacks." Today, churches in the United States remain separated based on the concept of race and/or ethnicity. Though some denominations within the Christian community have made strides at fostering multicultural congregations, approximately 93 % of churches remain segregated based on these factors (Emerson & Kim, 2003).

It is likely that Western cultural values of race and ethnic interaction impedes how Christians interact with one another. Likewise, Western cultural values of individuality and identity may negatively affect the individual purpose of Christians, and thus, Christian functioning. For example, Christian identity and functioning as a group is central to one's identity and functioning because "there should be no schism in the body, but that the members should have the same care for one another" (1 Cor. 12:25). Christian functioning is not possible unless interactions among those who identify themselves as Christians transcend socially constructed race ethnic and class lines.

Analysis of White privilege which is, "an invisible package of unearned assets that I [one who is White] can count on cashing in each day, but about which I was 'meant' to remain oblivious." White privilege is like an invisible weightless knapsack of special provisions, maps, passports, codebooks, visas, clothes, tools and blank checks" (McIntosh, 1989). White Christians may forego identification or

classification with non-White Christians in a social and personal sense in order to maintain societal rewards associated with White privilege. This can suggest also, that the influence of White Christians as members of the dominant group on other Christians may appear to, or in fact give rise to a relationship of perceived superiority versus inferiority, ability versus inability. White privilege gives the appearance of racism, however, (McIntosh, 1988) states that Whites "are carefully taught not to recognize racism," and therefore may not realize the extent to which they are a party to it.

The result in the non-White Christian could be a perception of hypocrisy in the White Christian. As feelings of stress, frustration, and despair with the White Christians' inability to recognize the meaning and purpose which comes from interactions as equal members of the Church, Black Christians could perceive the individual as a hindrance to making progress in the Church, Christians' lives, and in society as a whole primarily within the free-enterprise system.

While it is a fact that White privilege is pronounced and impossible to avoid, there remains the question of how Christians interact socially, and more importantly vocationally.

Christian race relations, in Western Culture particularly between Black and White Christians, developed during the Great Awakening of the late 1730's and early 1740's (Kolchin, 2003, p. 55). Prior to this time, Blacks would usually practice their native religion. This time also reveals that White Americans who had been practicing Christianity, did not show a lot of interest in sharing the gospel message with Blacks. Slave owners were concerned that if the slaves were given their freedom, slave owners would have to release them from their slave status (Kolchin, 2003). I refer to this as *Eur-religion*, Blacks becoming converted Christians would require that these practicing Christians modify their perceptions of the slaves. This was very difficult for the slave owners, and many others like them because they believed that Christianity and the United states were exclusively given by God to the Europeans because God favored them over everyone else.

Christian European slave/plantation-owners, developed a belief that they were God ordained and favored, to inhabit and develop the United States and its institutions by ruling over others, for the

purpose of their own personal gain. This belief gave rise to what is known as "Slave Religion" (Johnson, 1997). Slave religion was the manner in which the Christian gospel was introduced to slaves. It modified biblical scriptures to support a master/slave relationship between slaves and slave-owners.

THE CURRENT STUDY

Given the historical climate, one may question the degree to which Christianity or "the Church" mirrors the constructs of Western cultural values of race, ethnicity, and individual purpose. One must consider if the Christian church functions according to biblical teachings with regard to race or if there is significant evidence of "the Church" being influenced by Western culture such that racial tension exists in the Christian community. Likewise, if the Christian church is influenced by Western culture to the extent that Christians do not connect with one another in providing care and support to one another in matters of social and vocational significance. The current research seeks to understand if there are any implications of adverse cultural affects, relating to vocational network disconnects within the church community, in the most recent census data which states that Black Americans, "remain at the economic rock bottom of America – also below the U.S. Hispanic population" (Edney, 2007).

There is a need to understand how Christians internalize and are affected by Western cultural values of modern day race, ethnicity, individual identity, and purpose. Although in direct opposition to the values espoused by Christians, Western cultural values of race and race relations have likely infiltrated and may impede the functioning of the Christian community.

The primary research question investigates the relationship between factors associated with race and ethnicity and their affect on race relations and individual purpose in a sample of adult Christians. This research is important because 1) the experience of interactions between Christians across race and ethnic lines in Western culture as it relates to Christian functioning is significantly understudied, 2) factors associated with race and ethnicity may serve as impediments to Christian functioning and optimal societal impact by Christians and, 3) understanding cultural affects on race relations and individual purpose in the Christian community may elucidate ways in which to modify culture to improve race relations, individual contributions to

society, and optimal impact of the Christian church.

This research seeks to understand the interaction of race, Christian values and identity, and Western culture in the experience of Black Christians. Specifically, the study examined 1) experiences with race and racism in the Christian community (e.g., discussions of race, experiences with race as it relates to their religious beliefs, experiences with racism) and 2) the personal influence of these experiences on them personally from a psychological and psychosocial perspective.

METHODOLOGY

After receiving church approval to conduct the survey, participants were recruited from Christian churches during a regularly scheduled church service or approved event. Willing participants completed a consent form and 3 measures that gathered information on experiences with Christians, perceptions of race relations in the Christian community, demographic information, and self-esteem. Specifically, 3 questionnaires were administered measures. First, a modified version of the Schedule of Racist Events (RSE) measure was used to measure experiences with racism, specifically in the Christian community.

To fit this study, the researchers eliminated questions 2, 4 - 9 and 14 and modified the instructions to specify that the responses were given with relation to participants' experiences with White Christians. Second, the Rosenberg Self-Esteem scale (SRE) measured participants' self-esteem. The third measure was designed for the purposes of this study to determine specific experiences with race among Christians (Christian Experiences with Race Questionnaire: CERQ).

RESULTS

Preliminary data are provided on 100 Black Christian adults. The mean age was 49.40, (SD=13.59, range 18-77), 37 participants were men whereas 63 were women. Most were married (n=40), while some were single (n = 34), and divorced (n=22). 79% had children. All considered themselves Christians and most attended church more than once a week (69%) followed by once a week (21%), and once a month or less (10%).

Only data from the CERQ are discussed in this paper. As shown in Table 1, means and standard deviations indicated a number of important findings: 12% of the sample felt uncomfortable attending a church with a primarily White congregation,

15% did not believe that they were treated equally to Whites by the Christian church whereas 38% did not believe they were treated equally to Whites by society at large, 52% reported that they have experienced racial discrimination at least once in their life by a White Christian; 48% believed that the broader American culture influences race relations within the church.

Table 1

Participant Responses to Questionnaire Items

Questionnaire Item	Range	Mean (SD)
I feel "out of place" when I attend church's with a primarily White congregation.	1-5	3.70 (1.07)
I feel "out of place" when I attend church's with a primarily Black congregation.	1-5	4.17 (.89)
I have close relationships with Christians who are White.	1-5	2.45 (.98)
I feel appreciated in my associations with Christians who are White.	1-5	2.30 (.95)
When I need help getting a job, I network with Christians that I know who are White.	1-5	3.46 (1.10)
When I need help making advancements at work or at school, I can usually depend on Christians that I know who are White.	1-5	3.46 (.96)
I am treated equally to White Christians by the church.	1-5	2.58 (1.02)
I am treated equally to White Christians by society.	1-5	3.16 (1.01)
I believe that Christians who are White are concerned about the issues in society that affect me because of my race or ethnicity (e.g., racism, experiences with discrimination)?	1-5	3.00 (.89)
I believe that Christians who are Black are concerned for the issues in society that affect me because of my race or ethnicity?	1-5	2.25 (.89)
Because of my race or ethnicity I am not able to use the spiritual gifts and talents that God has given to me when working with Christians who are White.	1-5	3.65 (1.06)

Note: Responses are scores on a 1-5 likert-type scale from 1 "very true" to 5 "very untrue".

CONCLUSION

The preliminary results show that though most of the Black Christians surveyed were not uncomfortable attending a church with primarily a White congregation, although most of them had experienced racial discrimination by a White Christian. Future analysis of data from all measures using a larger sample will help us elucidate these relationships further.

There are significant implications of adverse cultural influences relating to networking for vocational opportunities or advancement with Christians who are White, as most respondents answered in the range from neutral to untrue when asked.

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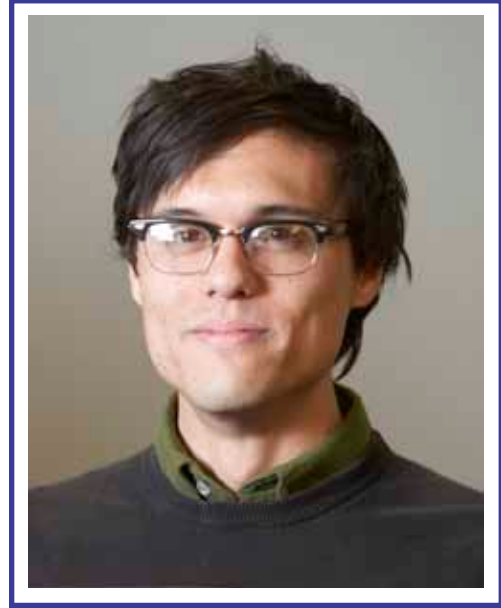
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DENIED INDICATIVE CONDITIONALS AND BICONDITIONALS

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INTRODUCTION

Fulda (2005) presents a solution to denied indicative conditionals and denied biconditionals. He supports the generally accepted solution that $\sim(P \rightarrow Q) = (P \rightarrow \sim Q)^i$, but he gives no independent motivation for the translation.ⁱⁱ For denied biconditionals, he finds a similar problem, but offers a new solution. He claims $\sim(P \equiv Q) = \sim\forall(x)(Px \equiv Qx)$, with the quantifier being implicit. In effect, the solution already was there; Fulda calls our attention to it. However, one can argue this fails.

The considered research shows that Lycan's (2001) event theory solves the problem of denied indicative conditionals and biconditionals, but with modifications. Lycan's account, without modifications, solves the problem for conditionals, but it falls prey to an unwanted equivalence for denied biconditionals. Lycan employs the material conditional in his formalizations, which is the source of the unwanted equivalence. Experimentation changes the formalizations in ways that retain the benefits of the theory while solving the denial problems.

METHODOLOGY

1. BACKGROUND

The philosophical problem of conditionals is very old. Though it is hard to pin down exactly which types of utterances are conditional, they are intuitively sentences of the form "If P, Q." Remarking on a debate on conditionals between two Stoic think-

ers, Sextus Empiricus noted, "Even the crows on the roofs caw about the nature of conditionals" (cited in Sanford, 1989, p.13). Here is a quick, inadequate way to approach the problem.

The material conditional (the conditional of logic and mathematics) ($P \supset Q$) is true when P is false or Q is true. The material account of the indicative conditional provides a simple theory of truth, but it leads to notoriously absurd results. That is, there are true material conditionals that are unassertable, which usually occur when a conditional's truth relies solely on the falsity of its antecedent. Consider the following:

(*) If I proved Fermat's Last Theorem, then squares have three sides.

(**) If I got a mathematics degree, then my mathematical insight equals that of Gauss.

I didn't prove Fermat's Last Theorem, and I didn't get a degree in mathematics, so (*) and (**) are both true. But (*) is clearly non-sense, and (**) is false. Regardless of what I do, Gauss's mathematical aptitude will dwarf mine. Conditional literature is replete with counterexamples to the bare material account of the indicative conditional. Yet the material conditional has a simple theory of truth – its truth table. Thus, one part of the philosophical study of conditionals attempts to explain when conditionals are true or false (if they are ever true or

false), which is roughly where this paper falls.

2. DENIED INDICATIVE CONDITIONALS AND BICONDITIONALS

2.1 *The Problem*

The only way for $(P \supset Q)$ to be false is for P to be true and Q to be false. That is, $\sim(P \supset Q)$ is logically equivalent to $(P \wedge \sim Q)$. Also, one may easily note the rule of conjunction reduction: The truth of $(P \wedge Q)$ logically entails the truth of P and the truth of Q . Note further that conjunction reduction works in language. For example, if someone tells someone else that "Bertrand Russell was a philosopher, and Albert Einstein was a physicist," and they take that as true, then they may take both "Bertrand Russell was a philosopher" and "Albert Einstein was a physicist" as true. Note last that the scope of negation can vary. In these examples, one may take the scope to be both the subordinate clause and the independent clause, and may also take to the negation to be logical; i.e., negating a proposition reverses its truth value (Huddleston, 1988).

Now, one can be ready to consider the problem, noticed by Nelson (1966), which Lycan (2001) calls the third paradox of material implication, adding to Jackson's (1987) first two. Suppose that the indicative conditional in English is the truth-functional material conditional. Consider a conditional taken as false: "If I win the lottery, I'll quit playing piano."
(P1) "It's false that if I win the lottery, I'll quit playing piano."

(C1) Therefore, "I win the lottery," and it's false that "I'll quit playing piano."

(C2) Therefore, (picking the first conjunct rather than the second) "I win the lottery."

In symbols:

$$\sim(P \supset Q) \wedge (P \wedge \sim Q) \wedge P$$

Thus, on the truth functional account, denying any indicative conditional commits one to the truth of the antecedent and the falsity of the consequent. The problem of denied indicative conditionals is well known, but there is a lesser-known problem for denied biconditionals. Consider Fulda's (p.1421) example: (1) "One is retired if and only if he [or she] receives social security." As Fulda notes, this is false since one can receive social security before retiring (through injury), and one may also refuse social security while retired. The following series of equivalencies, however, shows that $\sim(P \equiv Q) = (\sim P \equiv Q)$ or $(P \equiv \sim Q)$: $\sim(P \equiv Q)$

$$P \text{ XOR } Q$$

$$(P \vee Q) \wedge \sim(Q \wedge P)$$

$$(\sim P \supset Q) \wedge (Q \supset \sim P)$$

$$(\sim P \equiv Q)$$

With this equivalence, denying (1) gives us (adapted from Fulda):

(2) "One is not retired if and only if he or she receives Social Security," or

(3) "One is retired if and only if he or she doesn't receive Social Security," which both look bad. Even worse, through some more manipulation, Fulda (p.1421) shows, citing David Sherry, that $\sim(P \equiv Q) = (P \supset \sim Q)$ or $(Q \supset \sim P)$. Thus, denying (1) gives us the following:

(4) "If one is retired, then one does not receive Social Security," which looks even worse.

Attempts here at a translation scheme similar to the denied conditional case are blocked. We deny indicative conditionals with another conditional, but, as Fulda (p.1421) notes, for biconditionals, there are only three cases: the two mentioned, $(\sim P \equiv Q)$ or $(P \equiv \sim Q)$, which are bad, and $(\sim P \equiv \sim Q)$, which is logically equivalent to $(P \equiv Q)$ and so cannot be the denial of it.

The problem is now before us: if we take either the conditional or the biconditional to be material, absurd results follow.

2.2 *Solution Attempted*

For negated indicative conditionals, Fulda accepts $\sim(P \rightarrow Q) = (P \rightarrow \sim Q)$. His solution is pragmatic because it concerns translation. He claims that the negation in "It's not the case that if P then Q " is misplaced. The translation gives intuitive results. Consider (P1). This translates to

(5) "If I win the lottery, I won't quit the piano."

Or when one considers a conditional familiar to existentialism that can be denied:

(6) "If God is dead, then all is permitted." Negating (5) translates to

(7) "If God is dead, then not all is permitted." Or maybe,

(8) "If God is dead, then something isn't permitted."

The whole of objection to Fulda's treatment of denied indicative conditionals is that there is no independent motivation for it. If one can show how the translation works in terms of some theory of conditionals, then that would be desirable – in fact, other theories lend themselves well to a solution, such as certain possible-worlds theories.

Concerning biconditionals, as noted, Fulda claims that making a quantifier explicit solves the problem. He argues that (1) is equivalent to "It is not [always] the case that being retired is equivalent to receiving Social Security." There are then situations when one is retired and doesn't receive Social Security and vice versa. We thus need to "shift upward from propositional logic to predicate logic" (Fulda): $\sim(P \equiv Q) = \sim\forall x(Px \equiv Qx)$, as noted earlier. With conditionals, Fulda claims (p.1422) people misplace "not"; with biconditionals, they misplace "always."

Ian Dove explicates a problem with Fulda's biconditional solution. Fulda gives examples that lend themselves to quantification. There are many biconditionals, however, that are not generalizations; i.e., their proper translation is in the domain of propositional logic. Consider the following, taken from Dove: (9) "Greg will buy Principles of Biology if and only if it is on his syllabus." Fulda's quantification solution here is blocked.

Another problem with Fulda's treatment of biconditionals: With $\sim(P \equiv Q)$, through logical manipulation, we get $(\sim P \equiv Q)$. Fulda claims $\sim\forall x(Px \equiv Qx)$ solves the problem. He then pushes the negation through and claims $\exists x\sim(Px \equiv Qx)$ equivalently solves the problem. Through manipulation again, however, many get: $\exists x(\sim Px \equiv Qx)$ or $\exists x(Px \equiv \sim Qx)$. Thus denying (1) will be equivalent to: (10) "Someone is not retired if and only if he or she receives Social Security," or using a less awkward translation and switching the negation; (11) "Someone receives Social Security just in case that person is not retired." Both (10) and (11) are existentially quantified sentences, and they satisfy Fulda's requirements, but are false. Although quantification is to be kept, the domain of quantification should change to events.

3. THE EVENT THEORY

In his *Real Conditionals* (2001), William Lycan presents his event theory of conditionals. The theory is motivated by syntactic evidence that "If...then" is not an "unstructured binary sentence operator" that many assume to resemble "and" and "or" (Lycan, 2001). Lycan asserts that we can capture the meaning of "if...then" with paraphrases such as "in case," "on condition that," and the one he chooses, "in the event that."

For the various conditional expressions, Lycan (2001) offers the following:

P if Q = P in any event in which Q.

P only if Q = P in no event other than one in which Q.

P even if Q = P in any event including any in which Q.

P unless Q = P in any event other than one in which Q.

He gives the following formalizations for each (p.18):

P if Q = (e)(In(e,Q) \supset In(e,P)).

P unless Q = (e)((f)(In(f,Q) \supset f \neq e) \supset In(e,P)).

P only if Q = (e)((f)(In(f,Q) \supset f \neq e) \supset \sim In(e,P)).

P even if Q = (e)(In(e,P) \wedge (f)(In(f,Q) \supset In(f,P))).

Lycan (2001) explains that "e" and "f" (when in parentheses) are universal quantifiers that range over events, and "In" is "a sentential operator with an added argument place" with "'In(e,Q)' being read as 'In 'e, Q.'" Lycan puts in much effort explaining what events are and what kind of events his quantifiers range over.

As Brian Weatherston (2002) notes in a review of the book, events are different from worlds in that they need not be complete or consistent. Lycan explains that they are similar to "case," "circumstance," or "situation," all of which obtain rather than occur. The quantifiers range over a domain of events that context restricts. Lycan calls this domain of events "R" for "reference class." The reference class is formed by "envisaged" events, which amounts to events that are real or relevant possibilities. His quantifiers are thus universal, but they range over R. On the event theory: (12) "If I have a pet cat, then I'm happy" is true when all envisaged (real and relevant) events where I have a pet cat are ones where I am happy. Lycan takes the rest of the book up using this theory to solve various problems in the conditional literature, and he spends considerable time explicating his notion of R. Various results occur when one applies this to the two problems at hand.

4. APPLYING EVENTS, MAKING ADJUSTMENTS

When one applies the event theory to the problem of denied conditionals. It is unclear exactly how to deny a conditional given (P if Q) = P in any event that Q. So one must look toward the formalization. Recall that P if Q = (e)(In(e,Q) \supset In(e,P)). Thus, it is not that case that P if Q = \sim (e)(In(e,Q) \supset In(e,P)). Since "(e)" here is a universal quantifier ranging over R, pushing the negation through, we get $\exists e\sim$ (In(e,Q) \supset In(e,P)). Pushing through once again gives us something that looks familiar: $\exists e$ (In(e,Q) \wedge \sim In(e,P)). This, however, is no longer a source of problem. In natu-

ral language, using (P1): There is at least one real and relevant event where "I win the lottery" and "I keep playing the piano," which is correct. Once the negation is pushed as far as it can go, it is unclear whether one can manipulate any further. That is, the source of the problem in propositional logic – conjunction reduction – will leave us with, "There exists at least one envisaged event where I win the lottery," and "There exists at least one envisaged event where I keep playing a piano." However these are true only as a result of my process of envisaging the original conditional. The inference leading to either the plain P or Q – that is, asserting that those happen in reality – is invalid because, as Lycan notes, both events may not be actual.

The situation, however, looks worse for the denied biconditional problem. Manipulating $\sim(e)(\text{In}(e,Q) \equiv \text{In}(e,P))$ in the way shown earlier leaves us $\exists e(\sim \text{In}(e,Q) \equiv \text{In}(e,P))$, $\exists e(\text{In}(e,Q) \equiv \sim \text{In}(e,P))$, $\exists e(\text{In}(e,Q) \supset \sim \text{In}(e,P))$, and $\exists e(\text{In}(e,P) \supset \sim \text{In}(e,Q))$. Here, it seems at least odd to say that (1)'s negation is calculated as follows: If there is one event where a person receives Social Security, then that person is not retired (using $\exists e(\text{In}(e,P) \supset \sim \text{In}(e,Q))$).

The source of some of these problems is Lycan's use of logical connectives. If " \supset " replaces " ϵ " – set membership, or just plain membership – difficulties are avoided while still maintaining natural paraphrases of language. The reworked formalization of "P if Q" is:

$(e)(\text{In}(e,P) \epsilon \text{In}(e,Q))$. This accords well – perhaps even better – with the natural-language versions of Lycan's formalizations. "P in any event that Q" can be read as "P events are Q events" or "P events are an element of Q events." Note that also makes sense of P being a necessary condition for Q since all P events are present in Q events. Interesting results are found when this fares with the denied conditional problem.

Denying "P if Q" on the new notation yields $\exists e(\text{In}(e,P) \notin \text{In}(e,Q))$. Any further logical manipulation here is blocked since the logical connective is gone. When applied to the running example, (P1): "It's false that if I win the lottery, I'll quit playing piano" means that there is at least one envisaged event where "I win the lottery" that is not an event where "I quit the piano." At least one event satisfies this, but all envisaged events where "I win the lottery" could be events where "I quit the piano." These conditions hold true thus far, but may yet prove false.

It might seem unclear how adjustments can apply to biconditionals. To judge a biconditional, one must consider the equivalent two conditionals. Thus, in propositional logic $(Q \equiv P) = ((Q \supset P) \wedge (P \supset Q))$. With the event theory, this will also require two quantifiers, one for all envisaged P-events and the other for Q-events. Putting this together with my reworked formalization, P if and only if Q" is: $(e)((\text{In}(e,P) \epsilon \text{In}(e,Q)) \wedge (f)(\text{In}(f,Q) \epsilon \text{In}(f,P)))$. In language, All Q events are P events, and all P events are Q events." This amounts to saying that Q and P events have the same envisaged extension.

To deny this, we push the negation all the way through, which changes the " \wedge " to " \vee " by

De Morgan's law: $\exists e((\text{In}(e,P) \notin \text{In}(e,Q)) \vee \exists f(\text{In}(f,Q) \notin \text{In}(f,P)))$. Denying "P if and only if Q" is equivalent to there being at least one envisaged P-event that is not a Q-event, or there is at least one envisaged Q-event that is not a P-event. This looks just right for the denial of (1), which is false because there is either one envisaged event where someone receives Social Security and is not retired or at least one envisaged event where a person is retired but does not receive Social Security. Expressing a biconditional relationship between two propositions is equivalent to saying the two sets of envisaged events are the same set. Denying a conditional is equivalent to there being two unique sets of envisaged events.

CONCLUSION AND FURTHER COMPLICATIONS

One complication is that one leaves a logical connective in my formula: \vee . The manipulations one can devise, however, helps rather than hurt. $(P \vee Q)$ is logically equivalent to $(\sim P \supset Q)$. One can apply this to my formalization of the negated biconditional: $(e)(\text{In}(e,P) \epsilon \text{In}(e,Q)) \supset \exists f(\text{In}(f,Q) \notin \text{In}(f,P))$, which reads, "If all P events are Q events, then there is at least one Q event which is not a P event." This is correct. A biconditional is two conditionals, and if one conditional conjunct of a biconditional is true, then the other must be false if the biconditional is false.

Another arising complication applies to Lycan's research. However, if the event theory has problems, then so will foregoing account. The complication is that the event theory is not differentiated enough from a possible worlds theory, and the use of membership smacks of worlds. Weatherson (2002) notes that it is unclear why Lycan's syntactic

evidence for "All relevant q-events are p-events" does not equally support "All nearby q-worlds are p-worlds" (his emphasis).

Events are most likely incomplete, inconsistent abstractions that utterers envisage, though reality restricts the reference class of events. While it is said events are most likely incomplete, one can inflate them. Consider: (13) "If dark matter really exists in our universe, then we will know why our mass calculations of the universe are wrong." Here, one may envisage all the real and relevant events where dark matter exists in our universe. In this case, the event is so big that it is the size of the universe. The event looks complete because we consider the whole universe when calculating its mass. It is unclear here whether we can inflate events to the size of possible worlds. On a worlds account, one would consider the closest world where dark matter exists, and one sees if our mass calculations were wrong – this looks like the real and relevant requirements.

Along with the distinction between worlds and events is a problem regarding Lycan's notion of truth. As Ken Turner (2002) notes, Lycan's theory mixes ontology and epistemology in that a "strong epistemic component" determines R. If the difference between worlds and events is unclear, and if a worlds account has a clearly ontological theory of truth, then worlds might win here. However, as Lycan argues, the event theory solves certain problems that a worlds account doesn't. Further work on the event theory should explicate exactly what events are and should also focus on R, making exact the reference class of envisaged events.

This study's results give solutions to the problem of denied indicative conditionals and the problem of denied biconditionals. The merit of the account is that it solves both through one unified, though modified, theory of conditionals.

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CULTURAL COMPETENCE: HOW IT APPLIES TO THE WORLD

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ABSTRACT

Cultural competence has been proven to be very important to the American society. This research will explore why cultural competence is important. Also, it will present previous studies that explore the value of cultural competence. Furthermore, this research will layout the blueprint of a study that will be conducted in the near future. The study will test to see if being culturally competent influences patients' outcomes and whether they continue treatment. The subjects of this study will be juvenile offenders who have been arrested for the first time due to alcohol or drug intoxication/possession.

INTRODUCTION

America is the most diverse country in the world. You can find just about every culture in the United States. According to the U.S. Census Bureau (2001), the percentage of ethnic minority and multicultural individuals has recently increased to 30%. It is estimated that by the year 2056, the percentage will be up to at least 50%. Unfortunately, the number of health care providers of ethnic minorities is not increasing at the same rate. Because of this phenomenon, it is very important for medical practitioners and psychologists to be culturally competent. Cultural competency is the ability for a clinician to work well with different ethnicities by displaying some knowledge about the cultures of the patients and by being sensitive to the patient's cultural needs. This conducted study will test to see if

acknowledging clients', adolescents who have recently been arrested for substance abuse, culture will influence the client to think more positively about the therapists. The purpose of this study is to: (1) establish the psychometric properties of the Semi-Structured Interview for Consideration of Ethnic Culture in Therapy Scale (SSICECTS), including its factor structure, internal consistency, and concurrent validity, and (2) examine therapeutic effects gained from the administration of the SSICECT.

PREVIOUS STUDY

The study that a small group of researchers plan to conduct is based off a study completed by Donohue et al. (2006). This study consisted of 279 participants all of whom were undergraduate students with various ethnicities. The Consideration of Ethnic Culture in Therapy Scale (CECTS) was developed for this study. It consisted of 6 items that were rated using a 7-point Likert-type scale (i.e. 7= strongly agree, 4= neither agree nor disagree, 1= strongly disagree). The first scale consisted of four statements which were theorized to assess the importance of ethnic culture to each individual: "Ethnic Cultural Importance, ECI; i.e., my ethnic culture is a big part of my everyday life, my ethnic culture is of great importance to me, there are many thing I like about my ethnic culture, my ethnic culture should be addressed in therapy" (p. 871). The second scale consisted of two statements which were theorized to

assess problems an individual perceives to occur due to the individual's ethnicity: "Ethnic Cultural Problems, ECP; i.e., others have said things to me about my ethnic culture that have been offensive to me, I have experienced problems due to my ethnic culture"(p. 871).

The CECTS was compared to the Stephenson Multigroup Acculturation Scale (SMAS) to determine the relationship between the CECTS scores and the acculturation scale scores that the SMAS measures. The SMAS is a self-report survey which consists of 32 items that are answered on a 45 point Likert-scale. Two factor scores may be derived; Ethnic Society Immersion (ESI) and Dominant Society Immersion (DSI). The ESI subscale consists of 17 items with scores ranging from 17 to 68. Higher scores on this subscale indicate "greater enculturation of the individual to his or her own culture. The DSI subscale includes 15 items. Scores range from 15 to 60 with higher scores indicating greater acculturation of the individual to the dominant culture" (p. 872). The results of the comparison are as follows: the ESI subscale of the SMAS positively related to the ECI subscale of the CECTS. However, the ECI subscale of the CECTS was unrelated to the DSI subscale of the SMAS. The ECP subscale of the CECTS was not related to either of the SMAS subscale. This indicated that no relationship exists between perceived problems due to ethnicity and acculturation to both the culture of origin and the culture of the dominant society.

Immediately after the initial survey, 151 of the participants participated in an interview. There were thirteen interviewers who were each one of four ethnic backgrounds. The first part of the interview consisted of 11 demographic questions given verbally "relevant to the participant's age gender, grade point average, current number of enrolled credit hours at the university, money earned from employment, other sources of support, ethnicity, hours of cultural experience and athletic activities performed during the past month, and types of sports or exercise activities that were performed during the last month." This interview was designed to give the interviewee an opportunity to formulate an opinion about the interviewer. After the initial interview, the participants were asked to evaluate the interviewer through a brief questionnaire. This was administered by the research assistant. The participants were asked to evaluate the interviewer honestly and were assured the interviewer would not see their respons-

es. Then each participant was randomly assigned to one of two semi-structured interview formats (i.e., Semi-Structured Interview for Consideration of Exercise or Sports Participation in Therapy Scale SSICESPTS; Semi-Structured Interview for Consideration of Ethnic Culture in Therapy Scale, SSICECTS). The difference between the two scales is that instead of asking about ethnic culture, SSICESPTS asks about exercise or sports participation. After the semi-structured interview, the participants are asked to evaluate the interviewers once again. The results for this part of the study showed the participants in the SSICECTS group reported that their interviewers were more knowledgeable about and showed more respect for their individual ethnic cultures than the SSICESPTS group. Both interview formats resulted in positive interviewee perception of the interviewer (i.e. good clinical skills, would refer interviewer to a friend).

LITERATURE REVIEW

There is no one perfect definition of cultural competency. The National Center for Cultural Competence's definition encompasses (Horowitz, 2001):

Having a defined set of values and principles, and demonstrating behaviors effectively cross culturally; Having the capacity to value diversity, conduct self-assessment manage the dynamics of difference, acquire and institutionalize cultural knowledge, and adapt to diversity and the cultural context of communities served; Incorporating the above two items in all aspects of policy making, administration, practice, and service delivery; and involving patients, families, and communities. (p. 201)

Horowitz (2001) quoted that cultural competence "extends beyond cultural awareness and sensitivity and may be defined as the ability to use cultural knowledge effectively in cross cultural situations" (p. 201). Satel and Forster (1999) state that:

Cultural competence ranges from the gratuitous (advising clinicians to "respect" a patient's cultural heritage) to the misguided (believing that human identity and behavior are primarily culture-dependent) to the near-paranoid (presuming the therapists and patients of different racial groups will experience so much miscommunication and mistrust that the patients of different race or better yet, that the clinician and the patient should be from the same racial or ethnic group). The most radical vision of cultural competence claims that membership in an

oppressed group is a patient's most clinically important attribute and that White therapists are racist whether they know it or now. (p. 1)

Sue (2003) says that "cultural competence (along with the broader concept of multiculturalism) is the belief that people should not only appreciate and recognize other cultural groups but also be able to effectively work with them...cultural competency is skill-based---skills that should be in the repertoire of all practicing psychologists" (p. 440). As shown above, there are many definitions of cultural competence. Each definition encompasses different characteristics of a culturally competent clinician.

The idea of cultural competency has been around for a long while. However, it has only been a topic of research for the last few decades. One of the main reasons research is being conducted on cultural competency stems from the question: do patients have lesser dropout rates when paired with a therapist of the same ethnicity? This relates to cultural competency because if the answer to this question is in the affirmative, then therapists should address ethnicity and display some knowledge about an individual's ethnicity during therapy sessions, resulting with ethnicity playing a smaller role in patients' outcomes and dropout rates. Sue et al. (1995) found that Asian Americans, when paired with therapists who matched with ethnicity and language, generally attended more sessions, had lower drop out rates and better treatment outcomes than those who were not paired with an ethnic match. Mexican Americans had similar outcomes but the effects were less dramatic. Better attendance was associated with African Americans and European Americans and ethnic matches. However, ethnic match did not play a role in treatment outcomes for European Americans and African Americans.

Taylor, Gambourg, Rivera & Laureano (2006) found that "therapists shared the idea that cultural competence is incumbent upon the therapist being aware of his/her own assumptions and presumptions about the clients' cultural narratives... Further study of multicultural competencies in counseling and psychotherapy could be broadened by including the client's assessment of the therapist." Also, all the findings of this particular study support the notion that psychology needs to go beyond using a "checklist" to define and develop an approach to cultural competence.

Maxie, Arnold & Stephenson (2006), asked the question "do therapists address ethnic and racial differences in cross-cultural therapy?" This study consisted of 689 psychologists who took a survey at their leisure. The survey consisted of questions regarding experience with ethnically different patients, age, gender, region of residence, experience, sexual orientation, ethnic and racial membership, theoretical orientation, and work setting. The final question was optional and open-ended; it asked for "descriptions and examples of approaches used in addressing difference with clients, or any general comments."

This study found that 85% of the psychologists reported that racial/ethnic differences had been discussed with at least one client during the past two years. However, it was reported that less than half of the discussions were with cross-ethnic/racial clients and that less than half of the psychologists they knew discussed differences. Also, that their clients initiated the discussion more time than had they. The majority of the therapists reported that addressing ethnic/racial differences was similar to addressing other sensitive topics in therapy. Interestingly enough, minority psychologists were less likely to initiate any discussion about ethnicity/culture than non minority psychologists. Lastly, this study found that discussion of differences correlated with gender, age, ethnic/racial minority status and diversity experience.

Unfortunately, there is no perfect way to display cultural competence. However, there are many guidelines for how to be culturally competent in a therapeutic setting. For successful therapeutic interactions with individuals from different ethnic backgrounds, it is important for the clinician to be familiar with multicultural guidelines. This includes being knowledgeable about cultural beliefs and history, sociopolitical factors, values of the population and assessing perceptions of the impact of culture-related variables on mental health. Psychologists should attain knowledge about each patient's culture and utilize culture-specific strategies. Also, clinicians should refrain from making stereotypic assumptions regarding practices and cultural norms based on the individual's ethnicity. This can be disadvantageous for all parties involved (Donohue et al., 2006).

There is a correlation between culture and response to therapy. It is unclear whether patients are less likely to drop out of treatment regimens when

paired with his/her ethnic match. It is unknown why outcome is affected by ethnic pairing for some groups of people but not for others (Sue et al. 1995). It is also shown that it is not difficult for therapists to address ethnic culture in therapy, yet it is hardly ever done (Maxie, Arnold & Stephenson 2006). One would think that since being culturally competent has been proven to be more affective in therapy, that all therapists would embrace the idea, but it is obvious that this is not the case.

PARTICIPANTS

The subjects for this study will be juveniles who are arrested for the first time due to alcohol or drug intoxication/possession. It is expected that we will have 100 to 200 participants. Most likely the demographics will be as follows: 60-75% males and 25-40% females; 20-25% African Americans, 30-35% Hispanics, 40-45% Caucasians, and 5% other.

MEASURES

The primary measures will be the pre and post-interviews that assesses the interviewees' perspectives of the interviewer regarding the following: clinical skills, likelihood of recommending the interviewer to person of different or same ethnicity, ability to gain rapport, knowledge and respect of the interviewees' ethnic culture.

PROCEDURE

Shortly after the youth are arrested, and while they are still in the detention center, each youth will be invited to participate in the study (minors under the age of 18 years would require parental consent). The clinician will ask the participant questions from the demographic form, Consideration of Ethnic Culture in Therapy Scale, and Consideration of Alcohol and Drug Use in Therapy Scale. These questions are relevant to understanding the youths' perspectives to their alcohol use and ethnic cultural issues. Understanding these issues is consistent with best practice approaches to the addictions, and the information will be used to assist in guiding the implementation of their participation in alcohol abuse prevention classes that are currently mandatory for these youth in Clark County's Juvenile Justice System. After this is complete the clinician will inform the participant that the clinician will be leaving the room and the research assistant will be coming back in to ask the participant some questions. The research assistant will then ask the participant questions about the clinician's performance during the interview. After the participant has answered the

questions, the research assistant will inform the participant that the clinician will be getting back on the phone to speak with the participant again. At this time the research assistant will flip a coin and if it is heads the participant will receive the Semi-Structured Interview for Consideration of Ethnic Culture in Therapy Scale and if it is tails the participant will receive SSIAUTS. After the clinician has completed the interview the clinician will excuse her/himself and the research assistant will get back on the phone. The research assistant will then ask the participant post interview questions about the clinician's performance.

METHODOLOGY

For this study, a between groups research design has been selected. With this design, the researcher randomly assigns individuals to participate in one of two treatments and outcome measures are administered before and after. Also, the researcher uses a separate sample of individuals for each treatment condition. To use most other research designs would be too time consuming. It is hypothesized that subjects who receive the SSICECTS clinical interview will view the interviewer as more culturally competent. Participants who receive the Semi-Structured Interview for Consideration of Alcohol and Drug Use in Therapy Scale (SSIAUTS) will view the interviewer as more competent in alcohol prevention. Youth that have had a first offense due to drugs and alcohol are enrolled in the Substance Abuse Assessment & Referral Program (SAARP) which assesses all first time drug and alcohol offenders, then provides referral services to appropriate providers.

STATISTICAL ANALYSIS

There will be three dependent variables in this study: consumer satisfaction questionnaire, survey questionnaire and therapists' performance; and two independent variables: interview type and ethnicity.

LIMITATIONS

There will be very few limitations to this study. An obvious limitation will be that researchers are only testing these two scales on juvenile offenders. Because of this limited subject pool, we will not be able to generalize this study to other populations. In order to minimize these limitations, we could implement a control group. This would make our findings more generalized.

CONCLUSION

As the United States population becomes more and more diverse, cultural competency in the mental health fields has become increasingly more important. The importance of cultural competence is supported by a substantial amount of evidence. However, the evidence does not yield the same result for every ethnic group. Also, cultural competence is not easily defined. This is because cultural competence is a contextually based subject. Furthermore, there is no exact cookie-cutter way to be culturally competent. This makes it hard to design a research study based on this idea.

FUTURE RESEARCH

In the future, I would like to do a study with the same dependent and independent variables. I would like to conduct this study with other diverse population samples so that more conclusions can be decisively made in regards to cultural competence.

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EXAMINING ADOLESCENT INNER EXPERIENCE – A CASE STUDY

BY JACQUELYNN KAAA-LOGAN



ABSTRACT

Thoughts and other inner experiences are major factors in determining who people are and why they do what they do. Many people do not understand the meaning of the phrase “inner experience,” and they understand even less how to describe it. Psychology tried various methods of extracting this type of information from adults over the years; however, the exploration of adolescent inner experience is seriously lacking. One method used to describe adult inner experience is the Descriptive Experience Sampling (DES) method. DES requires participants to wear a beeper in their natural environments, obtain inner experience samples when beeped at random intervals (approximately six per sampling day), and describe those experiences to investigators in an expositional interview within 24 hours of each sampling day (usually five or six sampling days are required). Researchers conducted the current study to determine if adolescents were capable of describing inner experience with the use of the DES method and, if so, what might be learned from those experiences. Historically, with adult participants who have completed DES studies, the first expositional interview can take over an hour to complete; subsequent interviews usually become shorter as the study progresses because the participant becomes more confident in their inner experience descriptions. As evidenced by shorter interview sessions as the current study progressed, the accuracy with which our participant (a 13-year-old

female) described her inner experience increased thereby demonstrating the probability other adolescents could use DES effectively as well. Training adolescents to use the DES method could lead to earlier detection and treatment of psychological conditions, resulting in psychologically healthier adolescents becoming psychologically healthier adults.

INTRODUCTION

Psychology’s foundation was introspection—detailed self-examination of thoughts, feelings, sensations, motives (i.e., inner experience). Introspection however, was controversial. The controversy concerned “imageless thought”—Würzburg observers believed it existed whereas Titchener did not (Leahy, 2000, p. 95). While the introspection controversy continued, a new movement was forming. According to Leahy (2000), Watson believed that introspection “had nothing to recommend it and much to condemn it” (p. 235). In part because of this decision of introspection, as individuals we have learned to “distort, misinterpret, and misrepresent [ourselves], [our] relationships, and the world around [us]” in a way that has spilled over into society with substantial personal and societal consequences (Hurlburt, n.d., para. 16). Although it is not apparent to all of psychology, there are those who realize that introspection and the understanding of inner experience is a necessary and important part of understanding how individuals become who they are. Because of

the renewed interest in inner experience, we see the development of more reliable methods of exploring inner experience.

Inner experience is anything in awareness at any particular moment; it can be an image, a thought, a sensation, a feeling, anything--or nothing. One of the most sensitive methods used to obtain accurate descriptions of inner experience is the Descriptive Experience Sampling (DES) method (Hurlburt, 1997). DES does not rely on memory as retrospective methods do (Hurlburt & Heavey, 2004, pp. 11-12); it uses a random-interval beeper to cue participants to pay attention to a specific moment in their awareness and write down notes to use in discussing that moment in an interview with investigators within 24 hours.

DES has been used to explore inner experience in adults; however, research regarding exploration into adolescent inner experience is rare. Larson (1989) suggests the reason for the limited number of studies regarding adolescents and what they experience is because most adolescent research "deals with global, experience-distant constructs" (p. 511). Larson used the Experience Sampling Method (ESM) in a 1989 study to obtain data regarding young-adolescent daily activity. To alert participants to record their activities, Larson gave them an ESM random-beeping device. The results showed that the participants easily understood, and were capable of following, the procedures involved in using the device (Larson, 1989). Other studies using thought-sampling methods have mirrored Larson's opinion that adolescents are capable of using sampling methods; however, these studies do not delve deeply enough into the adolescent inner experience nor do they employ the same specific procedures DES employs (Larson, Dworkin, & Gillman, 2001; Silk, Steinberg, & Morris, 2003; Punzo & Miller, 2002; Whalen, Jamner, Henker, Delfino, & Lozano, 2002).

DES trains participants to become increasingly confident in describing the inner experience captured in a specific moment by a random-interval beeper and described to investigators within 24 hours of capture. When most DES participants attempt their first description of a sampled inner experience, it is an awkward, confusing, nearly impossible task. The first interview day is very difficult to grasp--most participants do not understand the meaning of "the moment before the beep" and investigators typi-

cally consider it "training." By the third day, most participants begin to grasp the concept of "moment before the beep" and DES is in full swing (Hurlburt & Akhter, 2006, p. 11). Hurlburt has found that, with this training, most people are capable of learning to observe and report their inner experiences accurately and truthfully (Hurlburt, n.d., para. 18). Knowing the confusion adults face when they first attempt DES, would it be wise to assume adolescents could describe their inner thoughts/experiences using the DES method? Furthermore, if they could describe their inner thoughts/experiences via DES, what could we learn?

METHODOLOGY

PARTICIPANT

As this was a case study, one participant was required for the study and had to be (1) an adolescent; (2) available to collect approximately six experiences (samples) per day (referred to as sampling days); (3) available to meet with DES investigators within 24 hours (the expositional interview); and (4) available to repeat the process for five or six sampling days.

We selected a 13-year-old female from the local Las Vegas area and held a meeting with her and her mother in which investigators explained the study and described the DES method along with study expectations of the participant. Investigators informed the participant that anything described in her sampling interview was confidential and if she did not want to describe a sampled experience, it was her prerogative.

The participant gave investigators permission to videotape interview sessions, investigators obtained informed consent, and the participant received her beeper with instructions on its use. A date and time was set for the first expositional interview. Investigators advised the participant she would receive a \$30.00 gift certificate upon completion of the study.

MATERIALS AND APPARATUS

The device used for cueing was a portable beeping device--random interval generator v.3.x (Hurlburt 2000c)--emitting a 700 Hz random-interval beep with intervals between beeps ranging from a mean length of 5 minutes to a mean length of four hours. The beeps continued anywhere from a minimum of 30 minutes to a maximum of 60 minutes and went into battery-saving chirp mode if not switched

off. Beeper dimensions: 4.15" X .85" X 2.40"; it weighs 4.5 oz (with batteries). The device included a transistor-radio-type earphone (Hurlburt, 2006, September 9). (See Figure for picture and Table 2 for beeper use instructions.) A 3" X 5" notebook was included for sampling notes.

PROCEDURE

Sampling day

The participant turned the beeper on, put the earpiece in her ear, and went about her normal routine in her natural environment. Upon hearing the beep, she (1) paid attention to what was in her awareness at the onset of the beep and (2) wrote enough particulars of that experience in her notebook so she could discuss that moment in detail in the subsequent expositional interview. The daily sampling collection process continued until she collected six samples no more than 24 hours prior to the expositional interview.

EXPOSITIONAL INTERVIEW

Within 24 hours of sample collection, one investigator picked up the participant at her home and drove her to the Sampling Lab where the other two investigators set up the videotaping equipment to record the interview. When all were present at the Sampling Lab, the interview proceeded in a closed interview room. One investigator took the role as lead interviewer and the other two asked questions if necessary. Each interview began with the same question, "What exactly was in your experience at the moment of the beep?" (Hurlburt & Heavey, 2006, p. 114). Investigators asked the question several different ways during the interview to ensure the participant remained focused on the specific experience that was in her awareness at the moment of that specific beep. (See Table 2 for question examples.) Discussion of the first sample continued until the description was as complete as possible, at which time discussion turned to the next sample. Investigators approached each sample in the same manner and addressed the remainder of the previous sampling day's samples. At the conclusion of the interview, we set a date for the next expositional interview. Participant and investigators completed five expositional interviews and following completion of each interview, investigators recorded a DVD from the taped interview.

FOLLOWING COMPLETION OF EXPOSITIONAL INTERVIEWS

The lead investigator wrote descriptions of the samples as soon as possible on the same day following the conclusion of the interview. After completion of the five expositional interviews, the process of identifying the salient characteristics of all samples began using the DES manual of terminology (Hurlburt & Heavey, 2006).

RESULTS

The participant easily adapted to wearing the random-interval beeper during her normal daily routine and the initial "shock" of being interrupted by a random beep subsided after experiencing a few her first sampling day. Sampling days became routine as the study progressed and the participant became at ease wearing, listening to, and paying attention to the specific important point in time, "the moment of the beep," as well as taking notes to assist in discussing samples with investigators.

The first expositional interview, as with most participants, was a teaching session in which the participant learned what investigators were interested in hearing from her regarding the samples and her descriptions thereof. Interview duration per sample for interview session five was significantly less than interview session one (see Table 1 below and Figure 2). The participant became more confident in her understanding of "the moment before the beep" as well as her inner experience descriptions and therefore, required minimal rephrasing of the original DES question and/or explanation of words or terminology used.

Table 1. Duration of Expositional Interviews

Interview Session	Duration (minutes)	Number of Samples	*Duration per Sample
1	43	8	5.375
2	37	6	6.167
3	37	6	6.167
4	16	6	2.667
5	18	6	3.000

* Note: Duration of interview divided by number of samples

DISCUSSION/CONCLUSIONS

Individual inner experience is at the very heart of who people are and with the lack of research in adolescent inner experience, studies such as this are imperative. In an article in the Las Vegas Review-Journal (1999), Benjamin states that Hurlburt hopes that by using DES it will be possible to get an idea of "what it's like to be you." Furthermore:

With an understanding of a patient's inner experience, a psychologist could tailor therapy to meet an individual's needs. Charting inner experiences also could bring researchers into the minds of patients with mental illnesses and help doctors understand what kinds of therapies work and why. (para. 10)

Previous studies show adolescents are capable of following the procedures required in using random-beeping devices (Larson, Dworkin, & Gillman, 2001; Silk, Steinberg, & Morris, 2003; Punzo & Miller, 2002; Whalen, Jamner, Henker, Delfino, & Lozano, 2002). Adolescent ability to use such a device, coupled with training in DES methodology, could lead to earlier detection and treatment of psychological conditions, resulting in psychologically healthier adolescents becoming psychologically healthier adults. Although the participant demonstrated an ability to use DES to explore and describe her inner experiences, the need exists for further research in this area to include both male and female adolescents and larger sample sizes with diverse ethnic, racial, and cultural backgrounds to ensure external validity.

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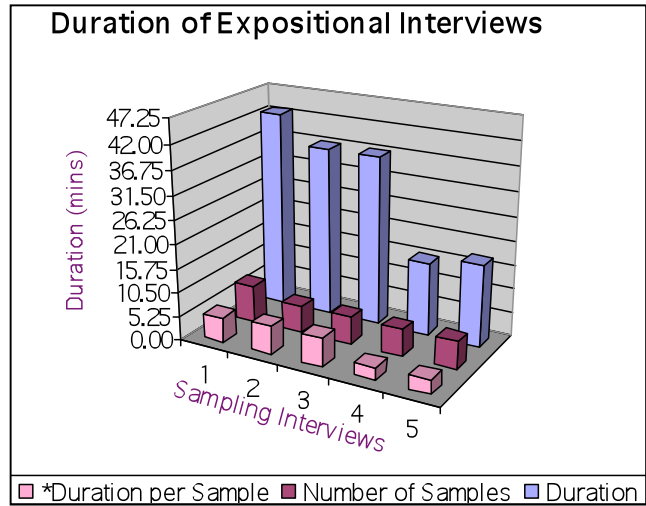
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Figure 2. Duration of Expositional Interviews

Table 2
v.3.x (Hurlburt 2000c) Beeper User Instructions

Earphone	Insert earphone into the earphone jack (can be done at any time).
Turn device on	Turn the beeper on with the ON/OFF/Volume thumbwheel.
Begin operation	Push the pushbutton to begin operation.
Volume	The beeper comes on beeping; adjust volume as desired with the ON/OFF/Volume thumbwheel.
Stop beeps and begin next interval	When the beeper beeps, stop it by pushing the button. That also begins the next interval.
Turn device off	When finished with samples for the day, turn the device off with the ON/OFF/Volume thumbwheel.
Device is not beeping	Push the button, there will be an alternating beep/silence. If it does not beep, unplug the earphone. If it beeps without the earphone, the earphone may be faulty. If after replacement it still does not beep, make sure the device is turned on; if it is, call for assistance.
Forget to turn device off	Beeper will enter a battery saving mode during which it will "chirp" (a very short, higher pitched beep) once every 15 seconds. Turn the beeper off and then back on to resume operation.



(Hurlburt, 2006)

Figure 1. Random interval generator ("beeper")
v.3.x.(Hurlburt 2000c)



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THE EFFECTIVENESS OF INCENTIVES IN THE HOSPITALITY INDUSTRY

BY JASON OROZCO



INTRODUCTION

The purpose of this study is to determine the effectiveness of incentive systems in the hospitality industry as part of a Human Resource Management Plan (HRMP). With all the factors that go into fostering a work environment conducive to producing an optimum output level from their employees, companies must determine if incentives still a viable option for hospitality companies or if they are simply throwing good money on top of bad money to cover up the short comings in our HRMP.

In 2003, Hardre states in her study that the subject of employee satisfaction and its relation to production is a matter that has been debated, tested and analyzed for many years in many industries. Opinions have varied as to what truly motivates individuals to perform at their optimum production level. There is no easy answer. When dealing with human behavior in the work place psychological dynamics and business methodology must be equally examined and weighed against each other to find a common balance.

Kohn (1993) argues that Human Resource Professionals (HRP) have attempted to do this and have shifted from a traditional Behavior Theorists model that typically distributes money and recognition for displays of desired behavior (incentives) to a more recently accepted Total Quality Management System (TQM) which seeks to empower employees

through participation and exploration of job responsibilities which can lead to higher job satisfaction. By doing this HRPs are recognizing the delicate balance that must be maintained in order to guide their company to an optimum output level.

The logistics force decisions on companies on how to distribute the monetary resources and recognition in a fair way if we are changing our optimum performance techniques. With incentive driven methodology already engrained into the psyche of American workers and HRP systems alike, issues such as how to successfully determine the proper utilization of the incentives system, if at all, in the hospitality organization arise.

This study seeks to examine the proper role of incentives as part of an HRMP in today's hospitality industry. Its significance lies in the fact that the specific nature of this topic has yet to be fully examined. In the considered search for literature regarding this topic very little has been done to examine incentives and their effectiveness in the hospitality sector. There is ample literature regarding the subjects of incentives, motivation, management theory, and hotel operations but very little that actually tries to tie it all together. With the competitive nature and high turnover rates associated with the hospitality industry, study in the area of human resource strategies and theory specific to the trade needs to become more readily available to HRPs to help

innovate the way we manage human capital. A Meta analysis will be performed of previous studies and analyze the types of aspects necessary to help solve the question: Are incentives still a viable option to today's HRP's to increase optimum employee output in the hospitality industry?

LITERATURE REVIEW

The considered literature review will be composed into three main subjects: 1) The purpose behind incentive systems 2) The theories that drive incentive distribution in the Behaviorist Theory model and in the Total Quality Management model of HRMPs and 3) The effectiveness of incentives on employee performance in the hospitality industry.

INCENTIVE SYSTEMS DEFINED AND THEIR PURPOSE

Bohlander and Snell (2007) state that incentive systems follow one formula: greater performance equals greater rewards. The most productive employees are supposed to be the highest paid and most rewarded at their position. Incentive programs (monetary and non-monetary recognition programs) establish a performance threshold (a base line performance level) that an individual or group must obtain in order to receive an incentive payment. Incentive plans are ideally meant to put an emphasis on organizational objectives through a focus on operating performance.

Numerous studies and articles (Bohlander & Snell 2007; Redman, Snape & Wilkinson 1996; A. Tomal & D. Tomal 1994) have stated advantages in incentive plans. Here is a brief overview of the findings:

- + Incentives foster teamwork when payments to individuals are linked to team outcomes.
- + Incentives attract, motivate and reward top achievers
- + Incentive payouts are variable costs linked to the achievement of results.
- + Incentives are a way to distribute success to those that are responsible for producing success.

Studies and articles (Bradley, Hendry, Perkins & Woodward 2000; Kerr 1975; Kohn 1993) have also documented the shortcomings of incentive plans and here is a brief overview of the findings:

- Incentives may inspire "Do Only What You Get Paid For" Syndrome
- Variables outside the employees control could affect performance.
i.e. late check outs, lack of supplies, etc.
- Difficulties in establishing uniform measurement techniques.
- Incentives can create a feeling of punishment if not attained.

Incentive plans can be constructed on the individual or group level for both line employees and management alike. The diversity in implementation of these systems varies by industry and is looked upon favorably by executives because incentives are linked to valued behavior (Bohlander & Snell 2007). The proponents and detractors alike will agree that if an incentive plan has any hope of effectiveness that it must appear fair to employees, the standards must be challenging yet achievable and payout formulas must be simple to understand. Table 1 illustrates some of the more common quality improvement incentive systems utilized by HRP's and the positive and negative issues that surround each system. This table offers a look into the thought process that goes into the types of concerns human resource managers have to debate before incentive systems can be put into place.

Table 1. Economic Incentive Systems Used in Quality Improvement

Incentive System	Positive Aspects	Negative Aspects
Profit sharing	High management control High company growth Effective with good profits	Low individual control Reward not timely Market conditions have high impact Employees' and company's goals need to be similar
Gainsharing	Encourages teamwork Promotes analysis and planning Promotes positive attitude	Not all participate Irrites freeloaders Not individual-based Develops perceived favoritism
Merit and performance	Primary focus is on merit or performance Feedback is promoted Based on individual performance	Appraisals can be demotivating Develops perceived subjective favoritism Not directly related to improved quality
Skill-based system	Rewards skills Provides incentive for development Promotes self-esteem	Primary focus is not on improved quality Often subjective Doesn't involve all employees
Bonus system	Directly rewards quality improvement Rewards unit teamwork Provides direct economic incentive	Hard to implement and manage Rewards often are not timely Doesn't involve all employees

Incentives have been a hot button issue the last ten to fifteen years due to a shift in human resources management philosophy from a Behaviorist model to a new Total Quality Management system (Redman, Snape & Wilkinson 1996). Due to the change in focus, the level of incentive's effectiveness can greatly vary in literature reviews of the topic. The lack of unifor-

mity in opinions leads specialists to believe that the benefits of implementing an incentive system are highly subjective and dependent on the strength of the overall strength of a HRMP. To understand this, the theories that drive incentive distribution in the Behaviorist model and the TQM system should be considered.

INCENTIVES THEORY: BEHAVIORIST MODEL AND TQM SYSTEMS

The roots of the behaviorist model are rooted in psychology. Behaviorism is a school of thought that states that only observable behavior should be studied. Variables such as cognition and mood are not considered due to their unpredictability. According to behaviorist theory, people's response to environmental stimuli shapes their behavior states Van Wagner (2007). Important concepts such as classical conditioning, operant conditioning and reinforcement have been founded in Behaviorism theory.

For the subject of HRM systems, previous models relied upon operant conditioning to increase employee production. Operant conditioning is a method of learning that occurs through awards and punishments for behavior. Van Wagner (2007) states that through operant conditioning an association is made between a behavior and a consequence for that behavior. Finishing projects or reaching specified goals at work to receive praise, promotions, or monetary gains are perfect examples of operant conditioning. The employee recognizes the incentive of displaying a desired behavior. The flip side of operant conditioning involves a negative consequence for an undesired behavior. The fear guest room attendants a.k.a. maids have for losing their jobs due to the lack in quantity of rooms cleaned provides the incentive to shape their behavior into compliance with property standards thanks to operant conditioning.

Historically, the hospitality industry has used incentives as a motivator per the Behaviorist model and the practice is prevalent in the majority of properties today. The amount of work a food server puts into a customer's dining experience or the amount of care given to an automobile by a valet is dependent on the desire for a tip. The level of effort a concierge will put into a hotel guest's experience is also dependent on the recognition and compensation that the employee will receive. From a Behaviorist's mindset behavior is changed according

to rewards and punishment. Factors such as pride in service, care for the customer and personal fulfillment are not considered. However, neither are factors as personal life issues, job dissatisfaction or illness. Quite simply, numbers are produced and results are recorded. Incentives for job performance rise from statistical data in the Behaviorist model. An industry that is powered by tips is an ideal example of Behaviorist theory and operant conditioning in motion.

As stated, incentives are designed so that greater performance equals greater rewards. Kohn (1993) reveals that it is difficult to overstate the extent of belief that most HRPs have in the redemptive power of rewards. It is also disclosed in numerous studies and articles (Connolly & McGing 2007, Kerr 1975 & Kohn 1993) that a vast majority of companies and corporations in the United States implement systems intended to motivate employees by linking compensation and recognition to indices of performance. As noted, cognition and mood are not considered as variables because of their unpredictability.

The school of thought that has gained steam among HRPs is the Total Quality Management (TQM) system. BusinessNet.com defines TQM as a philosophy and style of management that gives everyone in the organization responsibility for delivering quality to the customer. Each task within the business is seen as possessing a customer/supplier relationship with the next stage in the process. The objective is to empower employees to take ownership and have an understanding of the overall process necessary to produce a product or service. By interlocking all phases of a system instead of segmenting them and encouraging exploration of job duties and processes, TQM seeks to increase employee production through workplace satisfaction.

TQM, like the Behaviorist model, is rooted in psychology. TQM searches to find a balance between intrinsic motivation and extrinsic motivation. Hardre (2003) reveals in her study that intrinsic motivation is positive, internalized, self-owned, high quality motivation. A good example of intrinsic motivation would be a bartender who gets into the business because of the person's love for the nightlife and the atmosphere that surrounds it. Extrinsic motivation is externalized, other-caused, low quality motivation. An example of this would be a card dealer who hates cigarette smoke and loud environments

who gets into the profession for the amount of tips that can be earned.

TQM seeks to focus on the intrinsic motivators in the human psyche. Studies have shown that employees will perform better if they attain enjoyment from the task itself. In the TQM model, personal satisfaction in job duties leads to higher performance, greater creativity and initiative, higher competence, adaptiveness and increased communication skills (Ames & Archer, 1988; Hardre, 2003; Hiemstra & Sisco, 1990). This is not to say that employees who are intrinsically motivated do not want to receive recognition and/or monetary rewards, but that these incentives are a byproduct of their inner drive.

Literature concerning the place of incentives in the TQM model tends to fall into two categories: 1) Incentives do not work, incentives only provide temporary compliance amongst employees and do not bring lasting change and 2) incentives can hold a role in the a broader based TQM plan. The latter is closer to reality. As emphasized before, incentives have been engraved into the psyche of the American worker and are established in many HRMPs. Intrinsic motivation may be the best case scenario, but to eliminate the incentive system all together would be perceived as a violation of trust by employees and would be counterproductive. Incentives have a role in TQM as long as there is a well defined strategy that does not view incentives as the silver bullet that will slay the monster of disinterested employees.

EFFECTIVENESS OF INCENTIVES IN THE HOSPITALITY INDUSTRY

A study conducted by Connolly and McGing (2007), states that up to 97% of hotel properties offer reward systems for high performers. Incentives are a method that the hospitality industry has traditionally used to motivate management and non-management employees. Yet, the fact remains that there is not a significant amount of literature that focuses on the effectiveness of these incentive systems in the hospitality industry. With the academic study of the hospitality industry being relatively young compared to other traditionally instructed segments of business, the specificity of the subject matter has yet to be examined in full.

Another weakness in the data involving the effectiveness of incentives is the lack of a uniformly accepted system of measurement. It is stated in a study by Bradley, Hendry, Perkins & Woodward (2000) that

incentives are placed on short-term goals for the purpose of measurement. Complex tasks that require a significant amount of time to complete yet, are imperative to a company's success and are difficult to measure. It is a problem that the HRPs were facing at Wynn Las Vegas. Front line gaming supervisors were making on average \$40,000 less than the dealers they were supervising. In an attempt to even the financial playing field Wynn Las Vegas decided to give front line managers 40% of the dealer's tip pool (Simpson 2007). Steve Wynn defended this reverse in strategy by saying, "This is one of those moments that faces business where traditions must change. It will allow us to have the best team leaders and the best dealers, and will give dealers the incentive to advance, a wonderful opportunity to do better. It is unreasonable for the dealers to pretend that it is not so." This is currently a hot button issue in the Las Vegas gaming industry and it all came about due to a lack of a quality measurement system for management and non-management based incentives.

A study conducted By Miao, Namasivayam & Zhao (2006) examined the link between compensation practices in 1223 U.S. hotels and their performance. Incentives were not studied specifically, but as part of a package of pay, benefits, and incentives. It was found that the specific mix of benefits, pay, and incentives offered by a hotel property are of greater importance to non-management employees than pay itself. In the tests conducted by the research team, they found a positive correlation between a creative pay mix and organizational performance by non-management employees. In contrast, salaried management employees responded with higher levels of organizational performance when they are satisfied with direct compensation. Revenue per available room (RevPar) was used to assess organizational performance.

While the study appears to support the notion that incentive systems can work as a motivating factor in improved RevPar, it has its shortcomings. First, the data only measures one calendar year. One of the biggest critiques on the effectiveness of incentives is that it only promotes temporary compliance and a one year study does nothing to dispel this notion. Second, incentives were not given special attention, but were instead analyzed as part as an overall compensation strategy.

Study and review yields that the literature review on the effectiveness of incentives in the hospitality industry to be inconclusive. While it is agreed that incentives are widely used in the hospitality industry; a reliable system of measurement has yet to be established that takes into account intrinsic and extrinsic motivational factors when measuring the true effectiveness of incentives.

METHODOLOGY

The purpose of this study is to determine the effectiveness of incentive systems in the hospitality industry as part of a Human Resource Management Plan (HRMP). A Meta analysis was performed on the information available in the fields of psychology, human resources, customer service, compensation strategies, management theory, business and the hospitality industry in order to conduct my research.

The complexity of analyzing human behavior, compensation strategies and workplace efficiency in relation to each other requires funneling information obtained from many schools of study and harmonizing them to speak as one voice. In order to accomplish this task, a review of literature from books, academic journals, internet resources, newspaper articles and published interviews had to be conducted. After that was completed, a secondary analysis of previous studies and surveys was performed to obtain a well-rounded understanding of the issues in question.

The questions that are guiding this research include: Are incentives a viable option in today's hospitality industry or are they an outdated concept? To what degree are incentives embedded in current human resource management strategies? How do we accurately measure the true effectiveness incentive programs? What inspires employees to perform at an optimum level?

The limitations in this study lie in the lack of available information directly relating to the topic of research. In order to minimize these limitations a broad scope of study in many disciplines was required to get an understanding of the underlying issues involving workplace efficiency, human behavior and compensation practices.

FINDINGS/RESULTS

Results of the study have found that there is not enough data present to answer the question: Are

incentive systems an effective motivational tool in the hospitality industry as part of a human resources plan? Clearly incentives have traditionally been used partly in the hospitality industry as part of compensation systems but, a lack of a reliable measuring technique has hindered the progress in this study. Various forms of measurement from employee surveys to statistical evaluations lack the ability to examine the full scope of the issue. Also, the freshness of academic study in the hospitality industry limits the amount of information that has been published that directly examine the subject matter.

FUTURE RESEARCH

Further research and studies have to be conducted to help human resource professionals in the hospitality industry evaluate their compensation practices. With the unique nature of hospitality compensation systems that heavily rely on incentives, it is necessary to understand the effectiveness of these techniques in order to maximize organizational resources, increase productivity, and limit turnover. It has been said that the only true competitive advantage lies in an organizations' human capital. It is time to find accurate measurements of evaluation to properly organize and manage this valuable asset.

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ASSESSING THE DRY-LIMITS OF LIFE IN THE MARS-LIKE SOILS OF THE ATACAMA DESERT

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ABSTRACT

A customized DNA extraction and PCR amplification protocol for use with extremely arid soil samples successfully yielded DNA where previous methodologies had failed. The objective of this project is to analyze the microbial diversity of this formerly indecipherable environment.

INTRODUCTION

The Atacama Desert, stretching for more than 1,000 km along a narrow coastal plateau in northern Chile, is one of the driest locations on earth (McKay et al., 2003). Some regions within the Atacama have had no recorded rainfall for decades and the region has been dry for at least 10–15 million years (Ericksen, 1983). Specifically, the area around the Yungay Desert Research Station of the University of Antofagasta, is the driest part of the Atacama Desert. It is situated in a double moisture shadow, with the Andes blocking rain from the Amazon basin to the east, and the coastal ranges stopping the marine fog to the west. Furthermore, global atmospheric circulation forms a zone of high pressure that blocks other westerly moisture sources (Ewing et al. 2006). This unique geography creates a precipitation gradient that allows for testing of hypotheses concerning the dry limits of life. Continuous climate monitoring for the last six years indicates that mean annual precipitation decreases from 21 mm.y⁻¹ around the concentrated section of the rainfall gradient, to less than 2 mm.y⁻¹ near Yungay (Ewing et al. 2006).

A remarkable property of the Atacama is that, as a result of its exceedingly dry climate, the place is devoid of photosynthetic primary producers. Even hypolithic cyanobacterial communities, which colonize the protected undersides of translucent rocks the world over, are not found near Yungay (Warren-Rhodes et al., (2006). Cultivation, which entails spreading of soil on solid growth media followed by incubation, detected a few or no bacteria per g of soil (Navarro-Gonzalez et al., 2003). It has therefore been argued that, in the absence of aolean inputs, surface soils of the Atacama Desert would be sterile. Because of this, several authors (Navarro-Gonzalez et al. 2003; Warren-Rhodes et al. 2006) had concluded that at least portions of the Atacama exceed the dry limit of life as we know it. Even in light of very recent reports of culturable bacteria (Lester, et al. 2007) and possibly fungi (Conley, et al., 2006) from new samples obtained near Yungay, the question of whether or not certain soils of the Atacama are truly sterile remains to be completely addressed.

In recent years, soils of the Atacama have gained notoriety for their apparent “Mars-like” properties: e.g. the capacity of the soil to rapidly oxidize organics (glucose, amino acids) to CO₂-(Navarro-Gonzalez et al., 2003). This unusual result is reminiscent of that obtained during the Labeled Release experiment conducted on Mars in 1976 as part of the Viking mission (Navarro-Gonzalez et al., 2003). For this reason, with caveats concerning atmospheric

composition and temperature, the Atacama should represent an opportunity for the side-by-side comparison of methods for sampling and analyzing Earth and Mars soils.

Among the most sensitive approaches for life detection are those which involve amplification of DNA from environmental samples (e.g. the polymerase chain reaction (PCR)). Such approaches, however, are rendered ineffective if DNA cannot be extracted from the sample. In spite of workers' inability to recover DNA from Atacama soil samples, culturable microorganisms have been shown to be present (Warren et al., 2003, Lester et al., 2007). Thus, while DNA must also be present (e.g. in association with culturable cells), extraction methods were failing to recover amplifiable template for PCR. In order to circumvent these challenges, we proposed to utilize an approach utilized by Dr. D.P. Moser of the Desert Research Institute to obtain amplifiable DNA from extremely low biomass rock samples from the continental deep subsurface (Moser et al., 2003, Onstott et al., 2003). Since many of the difficulties in extracting DNA from soil and rock samples should be similar (e.g. liberation of free DNA from charged mineral surfaces), we inferred that these approaches would have a strong probability of success with our desert soils. The results of these exercises are reported here.

MATERIALS AND METHODS:

DNA extraction. Atacama soil samples were collected in sterile 50 cc polypropylene centrifuge tubes by Dr. Henry Sun of the Desert Research Institute in June of 2006 and stored desiccated at room temperature. The soil samples were collected along the precipitation gradient starting at the concentrated rainfall region and ending in the driest section of the Atacama Desert. (Fig. 1) These soils were generally powdery and well-mixed, thus grinding or other physical disruption was not performed. For DNA extraction, 5 g of soil was added to the bead solution tube of an Ultra Clean Mega Prep Soil DNA Kit (Cat # 12900-10 MoBio Laboratories, Salano Beach, CA), following the manufacturer's instructions, except for the addition of an initial freeze-thaw step using a 65°C incubator and dry ice. The final kit extracts (6 mL) were concentrated by isopropanol precipitation (1:10 vol 3M Na acetate) followed by several washes in 70% ethanol and resuspension in a very small volume (60 µL) of H₂O.

Molecular procedures. 16S rRNA genes present in DNA extracts were amplified using La Taq polymerase (Takara Mirus Bio, Madison, WI) and primers at 0.2 m. One microliter of DNA extract was added, and the reaction was incubated at 95°C for 5 min (1 cycle); at 95°C for 30 s, 50°C for 1 min, and 72°C for 1 min 30 s (35

cycles); and at 72°C for 20 min (1 cycle). PCR products were assessed by gel electrophoresis and cloned without purification using TOPO TA cloning kit (Invitrogen, # KNM4500-01). Clones were then sent to the Nevada Genomics center for sequencing with vector primers (9bF, 1512UR, 519UF). One 96 well plate of clones was created for each of the most extreme sites (S3, S4, RG). Currently, two plates have been sequenced (S3 and RG) using the primers (9bF, 1512UR, 519UF). To complete the project, S4 needs to be re-cloned and sequenced with the previously mentioned primers.

Quality assurance. Prevention or negation of contamination was crucial for this experiment's validity. Negative controls were utilized throughout the entire procedure: DNA extraction, alcohol precipitation, and PCR amplification. Aseptic technique was followed throughout, and the experimental procedure was performed in laminar flow and biosafety level II hoods. Prior to use, all equipment was wiped down with 95% Ethanol, machine parts were submerged in bleach water, and all chemicals and plasticware were treated with a UV Crosslinker (stratalinker 2400, Stratagene) to degrade potential contaminating DNA. Furthermore, in order to remove possible contamination in PCR reagents, the master mix (19µL) underwent a digestion with HaeIII (0.17 µL) (incubation at 37°C for 20 min, followed by inactivation at 80°C for 25 min) (Moser et al., 2005). To ensure that the digestion worked, one master mix was artificially con-

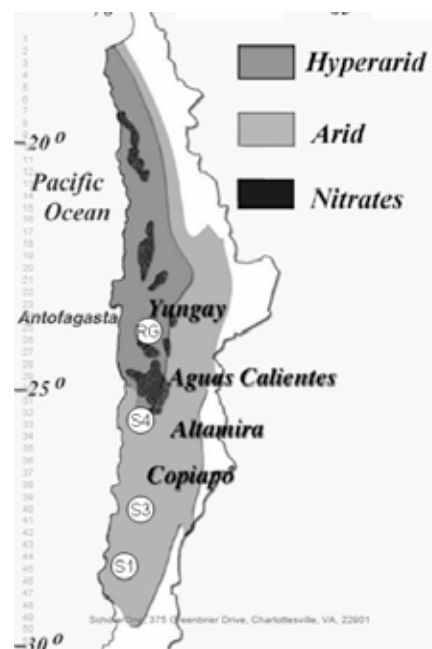


Fig. 1. Tested sites and aridity levels of the Atacama Desert (Warren et al).

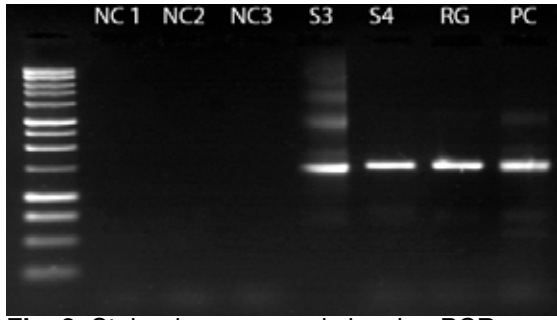


Fig. 2. Stained agarose gel showing PCR amplicons from various samples considered in this experiment. RG = Rock Garden, S1-4 are Atacama sites (Fig. 1). NC1 (PCR control w/artificial contamination, NC2 (PCR control), NC3 (Extraction control)

taminated with the positive control, digested, and amplified (Fig. 2).

RESULTS AND DISCUSSION

The modification of the DNA extraction procedure described in Moser et al. successfully detected DNA in all soil samples from the Atacama including those from Yungay (Fig. 2). Furthermore, negative controls were blank ensuring the absence of contamination. BLAST (NCBI) search results of the 9bF primer sequencing for sites S3 and RG are tabulated in Table 1 and Table 2, respectively. Information for S4 is pending. Nonetheless, a comparison between S3 and RG is sufficient for a preliminary study of the change in microbial diversity along the precipitation gradient of the Atacama. S3 is located in a region where primary producers are still common while RG is located in the driest part of the Atacama Desert.

As might be expected as the aridity increased, the microbial diversity decreased. Recurring BLAST hits (frequency) were not as prevalent in S3 as they were in RG. Frequencies for S3 only go up to 5, while RG has frequencies as high as 21. As for the dry-limit for life coinciding with surface soils of Yungay (RG), the data indicates that life is present in the surface. Some of this life appears to come from aolean inputs (e.g. clone F12_10H_FL EF683034) whereas other life has potential for survival in the surface (*Rubrobacter radiotolerans* RRU6564). Further sequencing with primers 1512 UR and 519UF will allow for the development of a phylogenetic tree with the complete sequences of the clone libraries.

CONCLUSION

Experimental results indicate that microbial DNA was present in all sites, supporting a re-evaluation

of prior claims (Navarro-Gonzalez et al 2003, Warren-Rhodes et al. 2003). Both the negative control and the sequencing results indicate that none of the DNA extracted and amplified was due to contamination. The BLAST results illustrate that there is a notable decrease of microbial diversity along the precipitation gradient. However, a study of site RG (Yungay) demonstrates that even under the most extreme conditions the Atacama Desert harbors DNA from a considerable number of microorganisms. However further studies need to take place in order to determine whether these organisms are native to the soils of Yungay, or whether they are a source of aolean inputs.

Table 1. Nearest uncultured 16S rRNA clone and cultured organism available in RDP for S3

Clone	Phylum	Nearest BLAST Match	% I.D.	Source/Ref	Frequen cy
7 S3	Actinobacteria No cultured relative	clone FI-1F_D02 EF220496	748/792(94%)	unvegetated soil environments at the Falkland Islands	2
8 S3	Actinobacteria Actinobacteria	clone 343G AY571815 Goodfellowia coeruleoviolacea DQ093349	782/806(97%) 758/809(93%)	hydrocarbon-contaminated soil unknown	2 1
16 S3	Bacteroidetes	clone CYCU-NirS-16S-NH-123 DQ10317 Bacteroidetes bacterium 20/6 DQ365990	709/749 (94%) 691/734 (94%)	activated sludge from municipal wastewater treatment plant soils of Marble Point and Wright Valley, Victoria Land, Antarctica	1 4
17 RG	Actinobacteria Actinobacteria	clone F12_10H_FL EF683034 <i>Rubrobacter radiotolerans</i> RRU65647	767/813 (94%) 749/819 (91%)	Eastern Mediterranean atmosphere Unknown	2 4
21 S3	Bacteroidetes Bacteroidetes	clone F15_8C_FL EF683049 Rhodocytophaga aerolata EU004198	746/809 (92%) 723/809 (89%)	Eastern Mediterranean atmosphere Air sample, Korea	2 2
22 S3	Bacteroidetes Bacteroidetes	clone J35H2 DQ365987 <i>Pontibacter</i> sp. z1 DQ888330	750/799 (93%) 726/803 (90%)	Soil Unknown	3 3
45 S3	Proteobacteria	clone ORSPEP_b06 EF393526 <i>Archangium gephyra</i>	605/612 (98%) 608/612	Ohio River sediments Unknown	1 1

		DQ768106	(99%)		
48 S3	Actinobacteria	Clone AKAU4123 DQ125873 Ellin124 AF408966	589/644 (91%) 597/616 (96%)	Uranium contaminated soil Soil	1 1
53 S3	No cultured relative	Clone 101-50 EF157216	371/412(90%)	Heavy oil seeps of the Rancho La Brea tar pits	1
54 S3	Actinobacteria	Clone DLE039 EF127610 Ellin6048 AY234700	656/681(96%) 631/682(92%)	Ice Soil	1 2
56 S3	Bacteroidetes	Clone PR21 DQ298339 Bacteroidetes bacterium 20/6 DQ365990	709/753(94%) 697/737(94%)	Rhizosphere root Soil	2
62 S3	No cultured relative	clone B1_22BS AM157316	765/796 (96%)	Bulk soil	1
64 S3	Actinobacteria	clone FCP410 EF516465 <i>Frankia alni</i> ACN14a CT573213	730/789 (92%) 749/811 (92%)	Grassland soil Unknown	1 1
71 S3	Actinobacteria	clone A18 AM746696 bacterium Ellin504 AY960767	651/675 (96%) 632/680 (92%)	rosy-discoloured mural Unknown	5 5
77 S3	Actinobacteria Actinobacteria	clone FQSS081 EF522301 bacterium Ellin504 AY960767	706/739 (95%) 692/742 (93%)	rocky mountain endolithic systems Unknown	1

79 S3	Actinobacteria	clone 28RHF5 AJ863359 Solirubrobacter sp. Gsoil 921 AB245336	767/815 (94%) 771/828 (93%)	Soil soil of the ginseng field	1 2
80 S3	Actinobacteria	clone AB-M31 DQ347867 Solirubrobacter sp. Gsoil 921 AB245336	742/771 (96%) 741/769 (96%)	soil-feeding termite mound soil of the ginseng field	1
	Bacteroidetes	clone AUVE_03D11	772/809 (95%)	Australian Vertisol	1
1 S3	Bacteroidetes	bacterium OS-26C EF612324*	783/810 (96%)	Lead zinc mine tailings	1
2 S3	Firmicutes No cultured relative	clone DLE014 EF127615	703/749 (93%)	Oldest ice on Earth (1)	1
3 S3	Bacteroidetes	Bacterium SL1.6 DQ516987	519/568 (91%)	Playa lake water column, Mojave Desert USA	1
	Unknown	clone AKIW395 DQ129287	729/749 (97%)	Urban aerosols, Los Angeles, USA (2)	1
4 S3	Actinobacteria	<i>Rubrobacter radiotolerans</i> AJ243870	710/754 (94%)	Unknown	1
	Actinobacteria	Clone C-F-4 AF443580	746/769 (97%)	Semiarid soil	1
9 S3	Actinobacteria	clone PKD_B5 DQ190233 Bacterium Ellin5247 AY234598	762/806(9 4%) 747/820(9 1%)	Aquifer Soil	1 1
10 S3	Actinobacteria	clone JSC8-B11 DQ532226 Rubrobacter radiotolerans	475/483 (98%)	Johnson Space Center	1

		U65647	462/484 (95%)		
11 S3	Sphingomonadaceae	clone AUVE_03B06 EF651036	754/767 (98%)	Australian Vertisol	1
	Sphingomonadaceae	bacterium KF016 AB269802	732/768 (95%)	Freshwater lake	1
12 S3	No cultured relative	Clone AT425_EubC11 AY053483	464/515 (90%)	Gulf of Mexico Gas hydrate	3
17 S3	Bacteroidetes	clone zdt-44a23 AC149043 bacterium 20/6 DQ365990	764/809 (94%) 754/793 (95%)	unknown soil	3
25 S3	Proteobacteria	clone EHFS1_S17a EU071538	757/795 (95%)	ESTEC HYDRA facility sludge biomass	1
	Proteobacteria	<i>Amaticoccus macauensis</i> AMU88042	746/795 (93%)		1
26 S3	Bacteroidetes	clone WN-HSB-202 DQ432304	746/815 (91%)	Lake Hamra sediment	1
	Bacteroidetes	Flexibacter group bacterium LA48	708/790 (89%)	Hawaiian Archipelago	1
27 S3	Actinobacteria	clone S2-36 EF491354 actinobacterium PB90-5 AJ229241	774/791 (97%)	steel immersed in marine water anoxic bulk soil	2 2
34 S3	Acidobacteria No cultured relatives	clone AKYG508 AY922029	783/825 (94%)	farm soil adjacent to a silage storage bunker	1
41 S3	Proteobacteria	clone F13_2B_FL EF682972 Oxalobacteraceae bacterium HTCC315 AY429715	811/846 (95%) 802/850 (94%)	Eastern Mediterranean atmosphere TCE and cis-DCE contaminated groundwater	1 1

42 S3	Actinobacteria	clone F15_6B_FL EF683037 Rubrobacter radiotolerans RRU65647	774/804 (96%) 762/816 (93%)	Eastern Mediterranean atmosphere Unknown	2
49 S3	Actinobacteria	isolate BF0002B089 AM697139 Frankia sp. M16467 AJ408870	802/819 (97%) 773/827 (93%)	indoor dust unknown	1 1
59 S3	No cultured relative	clone TZ-16 EF490087	478/509 (93%)	Lake soil	1
65 S3	Actinobacteria	clone FBP234 AY250866 bacterium Ellin5247 AY234598	552/596 (92%) 511/577 (88%)	lichen-dominated Antarctic soil	1 1
66 S3	Proteobacteria	clone FH1-70 AY599185 Thiobacillus prosperus AY034139	745/813 (91%) 733/802 (91%)	cover soil from landfill site unknown	1 1
73 S3	Actinobacteria	clone AT425_EubC11 AY053483 bacterium Ellin5301	684/765 (89%) 628/753 (83%)	Gulf of Mexico gas hydrate soil	1
74 S3	Actinobacteria No cultured relatives	clone SI-1M_D03 EF221457	753/808 (93%)	soil under mosses on Signy Island	1
75 S3	Actinobacteria	clone 343G AY571815 Crossiella equi AF245017	605/621 (97%) 589/628 (93%)	hydrocarbon-contaminated soil equine placentas	1
	Actinobacteria	clone F13_1E_FF EF683004	594/604	Eastern Mediterranean atmosphere	1

82 S3	Actinobacteria	Arthrobacter sp. VTT E- 052904 EF093123	(98%) 593/601 (98%)	surfaces of historic Scottish monuments	1
84 S3	Actinobacteria	clone F15_6B_FL EF683037 Rubrobacter radiotolerans X98372	664/768 (86%) 666/769 (86%)	Eastern Mediterranean atmosphere Unknown	1
92 S3	Bacteroidetes	clone J35H2 DQ365987 Taxobacter sp. SAFR-033 AY167829	753/805 (93%) 705/764 (92%)	Soil Spacecraft assembly facilities	1

Table 2. Nearest uncultured 16S rRNA clone and cultured organism available in RDP for RG

Clone	Phylum	Nearest BLAST Match	% I.D.	Source/Ref	Frequen cy
1 RG	Actinobacteria	Clone CH-18 AB293383	728/749 (97%)	anoxic rice field soil	4
	Actinobacteria	Cryptosporangium aurantiacum	712/748 (95%)	unknown	3
2 RG	Actinobacteria	clone Amb_16S_1027 EF018411	768/806 (95%)	aspen rhizosphere	2
	Actinobacteria	Kineococcus-like bacterium AS2978 AF060676	787/802 (98%)	Mojave Desert	2
3 RG	Actinobacteria	clone F14_8B_RF EF683018	628/644(9 7%)	Eastern Mediterranean atmosphere	1
	Actinobacteria	Geodermatophilus X92358	625/645(9 6%)	dolomite marble, Namibia	3
4 RG	Actinobacteria	clone FCPP410 EF516465 Frankia alni ACN14a CT573213	683/737(9 2%) 702/760(9 2%)	grassland soil unknown	9 11
9 RG	Actinobacteria	clone FCPP410 EF516465 Pseudonocardia saturnea EF588217	471/502(9 3%) 471/503(9 3%)	grassland soil unknown	1
10 RG	Actinobacteria	clone ACTINO2B AY494641 Cryptosporangium minutisporangium AB037007	779/806(9 6%) 734/780(9 4%)	Salmo salar gill unknown	3 2
	Actinobacteria	clone F12_10H_FL	767/813	Eastern Mediterranean atmosphere	21

17 RG	Actinobacteria	EF683034 Rubrobacter radiotolerans RRU65647	(94%) 749/819 (91%)	Unknown	15
19 RG	Actinobacteria	clone ST5 DQ347892 Blastococcus sp. BC521 AJ316573	396/400 (99%) 397/400 (99%)	soil-feeding termite mound Unknown	2 1
20 RG	Actinobacteria	isolate BF0001B033 AM697007 Actinomycetales str.Ellin143 AF408985	777/815 (95%) 768/801 (95%)	indoor dust Unknown	4 4
35 RG	Actinobacteria	clone F12_10H_FL EF683034	757/800 (94%)	Eastern Mediterranean atmosphere	3
	Actinobacteria	Rubrobacter taiwanensis AF465803	736/802 (91%)	Hot springs	3
42 RG	Actinobacteria	clone F6-99 EF688383 actinobacterium PB90-5 AJ229241	784/797 (98%) 789/797 (99%)	Soil Anoxic bulk soil	2 2
49 RG	Actinobacteria	Clone ST5 DQ347892 Blastococcus jejuensis DQ200983	678/694 (97%) 669/683 (97%)	Soil-feeding termite mound Beach sediment, South Korea: Jeju coast	1
	Bacteroidetes	clone AUVE_03D11	772/809 (95%)	Australian Vertisol	1
	Actinobacteria	Clone C-F-4 AF443580	746/769 (97%)	Semiarid soil	1
5 RG	Actinobacteria	<i>Blastococcus saxosidens</i> AJ316571	751/756 (99%)	Surface of marble stone (6)	1
24 RG	Actinobacteria	clone:APe4_52 AB074634 Frankia alni ACN14a	748/812 (92%)	apossymbiotic pea aphids unknown	1

		CT573213	771/835 (92%)		
32 RG	Actinobacteria	clone AKYH895 AY922168 Geodermatophilus X92358	767/788 (97%) 790/811 (97%)	farm soil adjacent to a silage storage bunker dry soil, rocks, and monument surfaces	2
72 RG	Actinobacteria	clone ACTINO2B AY494641 Frankia sp.FE41 AF063640	775/801 (96%) 734/784 (93%)	Salmo salar gill unknown	1
87 RG	Actinobacteria	clone F12_10H_FL EF683034 Rubrobacter radiotolerans AJ243870	745/786 (94%) 721/784 (91%)	Eastern Mediterranean Atmosphere unknown	1
88 RG	No cultured relatives	clone C062 AF507696	701/771 (90%)	Arizona Soils	1

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CREATIVITY IN BUSINESS: IN SEARCH OF AN EFFECTIVE MODEL

BY BONNIE BARTLETT



INTRODUCTION

A common assumption about creative people is that they are involved in the arts and they do not have a place in any organization that produces and answers to a bottom line in order to stay alive. Creativity tends to be associated with unorganized environments and chaos, whereas the typical business model is one of structure, timelines, and built on predictability. Given these contradictions, does creativity have a place in business? Can, or should, creativity be encouraged in financially successful organizations? Is there an effective model for organizational creativity?

PURPOSE

The purpose of this study is to determine an effective model for creativity in business. The study examines the body of creativity research as it correlates to business organizations and their management. It provides a background and working framework for organizational creativity, a topic which can seem elusive.

LITERATURE REVIEW

Creativity as a subject overall was evaluated, and the importance of creativity in business was determined. Current organizational philosophies were reviewed, in particular those which focused on organizational creativity. For instance, in Florida and Goodnight's work *Managing for Creativity* (2005), creativity is addressed as it relates to attitude and lead-

ership style. McGill and Slocum (1993) take this a step further by discussing ways to support a creative organizational culture. James Quinn (1986) touches on the idea of structure and the benefit of small, flat organizations in order to promote creativity. Andrew Hargadon and Robert Sutton's work, *Building an Innovation Factory* (2000), discusses ways management has been successful in guiding creatives -individuals who create- to make new products from old ideas.

METHODOLOGY

From the research, some of the common characteristics which run through organizations effectively managing creativity may be identified as:

- I. Leadership style
- II. Organizational climate
- III. Organizational culture
- IV. Resources and skills

Common Themes in the literature included:

LEADERSHIP: *Flexibility, Communication, Commitment, Strategy, Vision, Funding*

CULTURE/CLIMATE: *Trust, Freedom to Fail, Simple Processes, Learning Environment, Ample Stimuli*

STRUCTURE/SYSTEMS: *Remove Distractions, Small Teams, Keep Ideas Alive, Engage All Stakeholders*

REDUCE CREATIVITY

1. Constrained choice
2. Overemphasis on tangible reward
3. Evaluation expectation
4. Competition
5. Perceived apathy toward project
6. Unclear goals
7. Distraction
8. Insufficient resources
9. Over emphasis on the status quo
10. Time pressure

CONCLUSION

Innovation and creativity are far less mysterious than their image implies. They are a matter of taking developed ideas and applying them in new situations. After evaluating various elements of organizational innovation, some stand out as keys to ensure innovation success. This researcher believes an effective model for organizational creativity is one that begins with leadership, which sets the direction for organizational culture and nurtures attitude. Leaders need to understand and accept the tumultuous realities of innovation, and realize it can be bolstered anywhere if people are given opportunities and rewards for taking good ideas from all sources inside or outside the company. The plan starts at the top, is comprehensively communicated throughout a relatively flat organization, is appropriately staffed and funded. R & D is funded, as is training. The right workers are internally motivated, curious, have desire to collaborate. This research has shown that creativity does have a place in business, despite inherent contradictions. From this extensive review, an effective model of organizational creativity is proposed.

FUTURE RESEARCH

While much was revealed from this evaluation, further research opportunities exist. An assessment of the proposed model is suggested. In addition, this study does not reveal how this model translates to organizations that employ and engage those with cultural values other than the generally studied western model. As we become more global the relationship between various cultural values and creativity should be further explored.

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2008
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ARTICLES

THE LEGEND OF THE LAS VEGAS CHIAROSCURO

BY KATHLEEN BELL



INTRODUCTION

Every picture tells a story. This oft-repeated adage, while true, borders on triteness, except when a plethora of stories, folklore & legends encompass every aspect of the picture's commission, creation, content and resurgence. The peculiarity of this painting initially rests with the folklore surrounding its creation by an art director, sketch artist, or someone from Hollywood. Upon arriving in Las Vegas in the late 1950s to 1960s, this person became afflicted with the "gambling fever." Unable to pay the large debt the person had amassed, a silent ride to the desert for a "dirt sandwich" seemed to be their fate.

It has been well documented that the casino operators dealt out their own brand of justice to anyone who did not play by their rules. Dick Odessky, who describes himself as having been a "...casino flack and newspaper hack...during the most exciting quarter of a century in Las Vegas," relays in *Fly On The Wall*, anecdotes of these judgments (Odessky 2-3).

The casino operators took care of maintaining the peace, since they usually heard about crimes being committed before the law-enforcement agencies did, and they were used to dispatching problems their own way... Treatment for small-time offenders was generally a pretty severe beating, and perhaps a whipping with a leather belt. Some crimes required more severe punishment. A cheating dealer, for example, would be taken into a casino office where his hands were smashed with a hammer, permanently disabling him from dealing cards or handling chips professionally (Odessky 100-101).

Providence, or perhaps the sweetheart relationship that was developing between these modern day versions of Sodom and Gomorrah (Hollywood and Las Vegas), prevented the artist's untimely demise. Instead, the powers that be allowed the artist to create a Hollywood-styled painting large enough to grace the walls of their casino.

Perhaps the payment of a debt, a token of appreciation, or yet another sweetheart agreement, so very much a part of my father's world, is how the painting became his possession. My father, Charles R. Bell Sr. was a colorful man of many talents. He was best known for his adroit manipulation of Nevada politics from the 1960s through the 1980s. How it came into his possession is clouded by innuendo. When my father died in October of 2002, possession of the painting fell into my hands.

Brian Compton, a man who sometimes helped my aging father, had been storing it for him with the explicit instructions that it is given to me upon my father's death. The young man was true to his bond of fealty with my father. Shortly after the funeral Mr. Compton delivered the unwieldy roll of canvas and relayed the story to me as I have presented it. He thought the casino in question might have been the El Rancho Vegas Hotel and Casino, "the old one that burned," he said. I vaguely recall my father's mention of an old canvas of some significance.

This research is based on a journey of discovery regarding the provenance of a painting of Hollywood celebrities. This painting involves the past and present mores of Las Vegas, Nevada and its liaison with the movie industry people of Hollywood, California. Each film artists' career whose portrait graces the painting is briefly summarized. A review of any of their commonalities is also examined. The veracity of the folklore associated with the painting with respect to the identity of the artist who painted the canvas, the original location where it hung, the alleged circumstances surrounding the commission of the said piece, as well as the particular format and its original ownership is explored. This paper includes the chronological journal documenting the search of the pedigree of this monochrome as revealed to me by esteemed members of the Las Vegas and Nevada community.

There is no signature to identify the artist. Perhaps the creator did not want to be identified due to the alleged circumstances prompting the work. Or maybe this is perhaps just one of several pieces. Varying sizes of early Hollywood film celebrities are painted on the canvas in a zigzag pattern in shades of black, white and gray. The star in the center is notably larger than any of the rest, at least 2 ½ feet in diameter. Ten of the portraits are almost two feet in height, five are marginally smaller, and the other two approximately the size of a human head. The oil painting was created on a 9-½' x 4-¼' canvas in chiaroscuro style.

CHARACTERS

The eighteen celebrity portraits who grace this canvas are as follows (Top L-R): Humphrey Bogart; Lauren Bacall; Alan Ladd; Clark Gable; Spencer Tracy; Hedy Lamarr; Ronald Reagan; Carole Lombard; and Edward G. Robinson. (Bottom L-R) W.C. Fields; Greta Garbo; Mickey Mouse; Tom Mix; Marilyn Monroe; Gary Cooper; James Cagney; Cary Grant; and Charlie Chaplin are all represented. The American Film Institute officially considers most of this illustrious group of stars, legends:

The American Film Institute defines an American screen legend as an actor or a team of actors with a significant screen presence in American feature-length films whose screen debut occurred in or before 1950, or whose screen debut occurred after 1950 but whose death has marked a completed body of work (Corey and Ochoa 300).

Over half of the stars in the painting fall into the category of screen legend: Humphrey Bogart; Lauren Bacall; Clark Gable; Spencer Tracy; Carole Lombard; Edward G. Robinson; Greta Garbo; Marilyn Monroe; Gary Cooper; James Cagney; Cary Grant and Charlie Chaplin.

Many artists in the film industry did not survive the move from silent movies to the "Talkies." The AFI screen legends on this painting, which had their screen debut during the silent era, are: Carole Lombard; Clark Gable; Charlie Chaplin; Gary Cooper; and Edward G. Robinson. According to the AFI, one studio tycoon rejected the 1927 invention, calling talkies a fad (Corey and Ochoa 28).

This black and white monochrome painting is a fitting tribute to the early years of film. These stars' film career debuted prior to the permanent use of color, post WWII. In a *Short History of the Movies*, the authors explain that in the 1950s color became the rule with black and white the "exception." Even the "B" movies were being made in color. It soon became a means to achieve "essential dramatic and thematic functions" (Mast and Kawin 234).

Most of the movie stars appear to be depicted as in one of their most beloved roles. Anchoring the top-left corner of the painting are two of the larger portraits, the much adored couple known as, Bogie and Bacall. A well-worn captain's hat, tipped low over his brow, partially covers the craggy faced profile of Humphrey Bogart (1899-1957). Situated slightly below Bogart's image and to the right, is Lauren Bacall's likeness. Luminous, almond-shaped eyes observe onlookers with askance. History tells that once they met, the magnetism between Bogart and Bacall was undeniable.

Professor of English at Temple University, author and film critic, Joan Mellen, chose to write about Humphrey Bogart in *Close-ups The Movie Star Book*. In her contribution she said Bogart is not remembered for his gangster roles, but rather for his P. I. character, Sam Spade who will, "always simply and silently do the 'right thing' and always by his own definition of 'right'." Bogart's Sam Spade was, "fierce and unrelenting, but a man also capable of both love and unalloyed altruism" (Peary 222).

novelist and author of books about the screen trade said Lauren Bacall's "voice was as deep as any woman has ever had on film... that was more erotic even than the sleepy eyes." Thomson said rather than move about in a scene, Bacall, "just slouched or waited for people to come back to her." Once she started working with Hawks, he called her *The Look* (Peary 468-470).

Only just above and to the right of Bacall, is one of the two smallest images, that of Alan Ladd (1913-1964). The painting does not reveal a particular garb that would identify one of the roles he played. Whether a western or film noir, the enigmatic smile, is undeniably Ladd's. *The American Film Institute Desk Reference* recalls him as a "Blank cool dramatic actor." His starring role in the western *Shane* (1953) is his most notable film. Ladd eventually gravitated to "dark detective films," such as the 1942s *The Glass Key* (Corey and Ochoa 256).

To the right and larger than life (one of the ten largest portraits) is the King and heartthrob of generations of females and an all around man's man, Clark Gable (1901-1960). He is portrayed in his later years with his hair graying at the temples. Hal Erickson, of *All Movie Guide* wrote that Gable earned the title of "King" over a period of three decades. His large ears and "cocky grin" matched his "screen persona as a rascal." His Rhett Butler role in *Gone With the Wind* (1939) still has women swooning. In 1955 he broke from MGM to become the highest paid freelance actor of his time. In 1960 Gable was cast in the introspective "modern" Western, *The Misfits*. Gable died of a heart attack two days after the wrap. Most of the American papers proclaimed his death with this headline: "The King is Dead" (Erickson).

Next to Gable, wearing a fedora is also one of MGM's top stars, Spencer Tracy. *The American Film Institute Desk Reference* reported that Tracy started on Broadway before turning to film in 1930. He had a confident, easygoing acting style that kept him in leading roles for 40 years. He won two consecutive best actor Academy Awards for *Captains Courageous* (1937) and *Boys Town* (1938). He starred in numerous notable films in his career such as *Inherit the Wind* (1960). Tracy's final film *Guess Who's Coming to Dinner* (1967) was with his close intimate and co-star, Katherine Hepburn (Corey and Ochoa 275).

Dark haired beauty, Hedy Lamarr's portrait is one of the five medium size likenesses.

She is almost riding on the broad left shoulder of Spencer Tracy. His patient smile seems to indicate that he does not mind a bit. This Austrian-born actress started her career in European films. The AFI referred to her as a "beautiful siren." She began her career in Europe where she appeared in the 1933 Czechoslovakia film *Ecstasy* nude. In 1938 she arrived in Hollywood gaining roles mostly in dramas and melodramas. She is most remembered as Delilah in *Samson and Delilah* (1949). She wrote an autobiography in 1966 called *Ecstasy and Me* (Corey and Ochoa 256).

Ms. Lamarr appears to be sitting prettily on the right shoulder of an American president. Ronald Reagan was an actor in motion pictures prior to his move to the political stage. He smiles courageously, and appears to be wearing a jersey like George Gipp, "The Gipper," a dying football player Reagan portrayed in the movie *Knute Rockne All-American* (1940). Reagan's ascent to the highest political office one can hold, the President of the United States, is about as all-American as one can get (1981-1989). He was also president of the Screen Actors Guild (SAG) from 1947-52 and again, 1959-60. Perhaps his reign in Hollywood inspired the artist of the painting to include Reagan, as he was never a top-ranked star. Additionally, this painting may have been created during Reagan's SAG presidency.

To Reagan's left, Carole Lombard (1908-1942), is posed, chin resting on the palm of her left hand and is gazing up toward the heavens. She began her career at the age of 12 in silent films and grew to be a glamorous star in sound films. She was known for her easy comic style both on and off camera. David Barrowclough's, *Hollywood Heaven*, recounts that Lombard's life was cut short when she died in a plane crash just outside of Las Vegas. She was touring the states, promoting the sale of war bonds. She married William Powell and Clark Gable (17-18).

A larger somber countenance holds up the right corner of this parade of stars. Edward G. Robinson (1893-1973) is known by the AFI as "One of the most masterful character actors and lead of the sound era." He embodied the 1930s gangster. *The American Film Institute Desk Reference* recalled that a special Academy Award was given him posthumously (Corey and Ochoa 269).

Below Robinson is one of the most handsome and debonair men to ever don a fedora.

One of the five medium sized portraits is Cary Grant (1904-1986) who had an illustrious career. A condensed version hardly seems to do him justice. *The American Film Institute Desk Reference* remembers him that this British actor was the “epitome of wit and sophistication.” He moved with cat-like grace, and like the feline his characters were aloof, even in the romantic comedies such as *The Philadelphia Story* (1941) and dramas like Hitchcock’s *Notorious* (1946). Many leading ladies vied to be his co-star. Though he never received an Oscar, he was awarded a special Academy Award in 1969 (Corey and Ochoa 246).

The most beloved character played by director, actor, producer, and screenwriter. Charlie Chaplin is the diminutive, thin-mustachioed image of the *Little Tramp*. Black bowler atop his head, the British-born American actor looks back at the viewer with his automatic pilot expression. *The American Film Institute Desk Reference* states that Charles Chaplin (1889-1977) defined the silent era with his comedic portrayal in films of the Tramp. He helped to found United Artists. He was honored with knighthood in 1975. Charlie Chaplin received special Academy Awards In 1927-28 and 1972 (Corey and Ochoa 306).

In contrast to Chaplin’s style and on the opposite side of the painting anchoring the bottom left corner is a larger picture of the great prestidigitator and peregrinator himself, W. C. Fields (1879-1946). Top hat cocked at a rakish angle and ever present cane in hand, one just knows this foot and a half image is taking stock of oneself and has them figured for a sucker. Known as a master of wisecracks *the American Film Institute Desk Reference* reports he was known worldwide as a vaudevillian. He performed in a few silent films from 1915, but was not recognized as a major player until the talkies. Prior to the WWII he filled the theaters and was considered an “an icon of humorous misanthropy and surly braggadocio in films.” In 1980, a US commemorative stamp was issued in his honor. After his death in 1946, he became a cult figure (Corey and Ochoa 111, 243).

A full shoulder-length above the sham artist’s left is the ever-elusive Greta Garbo (1905-1990). Her eyelids are lowered, and she is looking away with an almost imperceptible smile upon her lush lips. Known for her “elusiveness and androgyny,” *the American Film Institute Desk Reference* said that this star of both silent and sound movies was an enigma, on and off screen. She was the lead in many “star

vehicles” such as her earliest, the *Temptress* (1926). Her most memorable was the 1930 *Anna Christie*. In 1941, she chose to retire from film living predominantly as a recluse (Corey and Ochoa 245).

Surprisingly, the star just below Garbo’s left is the first lead to follow to date this painting. Not because of the vast body of work he has starred in. However, because he has been created in several forms, with and without eyebrows, button eyes versus the same with a large oval circle around them, ears that did and did not work. In the painting, a bright light seems to emanate from this effervescent personality, Mickey Mouse.

Mickey Mouse appeared in his first silent animated cartoon in 1928. This little mouse’s image has grown to an iconic magnitude that shines brightly in the minds of people young and old worldwide. Searching through this animated wonders background revealed that 1939 was the last appearance of Mickey’s black button eyes in the animated cartoon, *Society Dog*. The debut of his current design, and the one on the painting, was in the same year as his cartoon, *Little Whirlwind* (1941).

Just above Mickey Mouse, a small and child-like cowboy in an over-sized, black, ten-gallon hat seriously looks back over his right shoulder. It is the flamboyant Tom Mix (1880-1940). IMDb, the Internet Movie Database’s, Ed Stephan tells that Mix worked for Fox from 1917-1928. He made five or more pictures a year often, writing and directing them too. Stephan says Mix’s “popularity eclipsed all other great cowboy stars of the silent era.” He also had an amazing, talented horse named, Tony the Horse.” Mix made a few talkies and then turned to the circus for his livelihood. Tom Mix was, “the king of the cowboys during the 1920s and remained popular on radio and in comic books for more than a decade after his death” (Stephan 2).

Back across the canvas, to Chaplin’s right, the large sized, James Cagney peers at onlookers through hooded eyes, looking very much like he did in one of his many gangster roles of the 1930s and 40s. *The American Film Institute Desk Reference* said Cagney: “Trained on Broadway and in vaudeville, he started in film in 1930 and developed into one of the archetypal film gangsters defining the urban rough guy in such features as *The Public Enemy* (1931), and *White*

Heat (1949)." He starred in several other gangster films. However, he always thought of himself as a song and dance man. Warner Brothers 1942 *Yankee Doodle Dandy*, a musical biography about George M. Cohan, won Cagney an Academy Award, and will testify to Cagney's self-image. In 1974, Cagney received AFI's Life Achievement Award (Corey and Ochoa 235).

One may attempt to find commonalities amongst the stars. Beyond co-starring with one another on occasion, there was no tried and true group or allegiance to any of the studios. They all were bound by the same rules and production codes and most were working within the existing studio system. Their levels of success varied, the closest correlation to that might be in the size of their image. Yet, Charlie Chaplin, silent movie actor and comedian is one of the smallest pictures and he was and always will be an icon and a vanguard in acting and filmmaking. His smaller portrait rounds the right side of the painting.

The American Film Institute Desk Reference, sums up the image portrayed by the attractive, Gary Cooper (1901-1961). They state, "In silent and sound films, often opposite Hollywood's leading femmes fatales, he was a laconic, easygoing lead who projected both moral rectitude and a mischievous streak." Ironical that his over-sized back in the painting is turned to Cagney's gangster. Cooper's variety of roles allowed him to become "a 1930s romantic comedy star" ... as in *Mr. Deeds Goes to Town* (1936). He won an Academy Award for best actor in *Sergeant York* (1941) and another in the western, *High Noon* (1952). In 1961, shortly before his demise, Cooper received a special Academy Award for lifetime achievement (Corey and Ochoa 237).

The largest and central portrait is that of the platinum blonde bombshell, Marilyn Monroe (1926-1962). This star's sensuality exudes from the painting yet her eyes have a haunted, vulnerable, yet questioning look. She started in dramas such as *The Asphalt Jungle* (1950) and comedies and musicals like the 1959 *Some Like it Hot*. *The AFI Desk Reference* concedes that, "Her private life generated huge interest, given that her husbands included ballplayer Joe DiMaggio and playwright Arthur Miller." There has been much controversy surrounding her relationship with both Jack and Robert Kennedy. *The Misfits* (1961), written by Miller was especially created for Monroe. Sadly, along with Monroe's co-star, Clark

Gable, it proved to be their last film. Monroe died of an apparent barbiturate overdose in 1962. "Her cult of fans has only grown since" (Corey and Ochoa 262).

METHODOLOGY

Research trying to date this painting based on the stars portrayed proved unsuccessful. Many of the stars in the painting began their careers in the same era as Mickey (1925), some long before. Most were well on their way to stardom when the Mouse's latest version was created (1941). This path proving fruitless, research turned to the Special Collections Department at UNLV.

I pled my case to the Manuscript librarian Su Kim Chung. She introduced me to an Archivist II, Joyce Marshal-Moore who confided that her father had worked at the original El Rancho Vegas Hotel and Casino. As a result, she said she had spent a good deal of time at the hotel and remembered it well. I showed her a photograph of the painting and repeated the story of the purported art director and his gambling debt.

This formidable woman let me know that under no circumstances could that have happened at the El Rancho Vegas for at least two good reasons. One, the people who ran that casino suffered no fools. Their judgments were swift and cruel. Two, the design was strictly western at the El Rancho Vegas, ala chuck wagon barbecues and western garb. All the archivists were extremely helpful suggesting several avenues I could try. Library Technician I, Delores Brown Lee even assisted me by scanning the photo and making a DVD file of the photo for me. Not knowing the name of the casino where this tale supposedly took place, the artist's name, or even the year of the paintings creation was like searching for a needle in a haystack. Undaunted, I explained to the librarians that sometimes it's the journey that is most important.

PROCEDURE

I spoke to the Curator for the Las Vegas News Bureau and Convention and Visitors Authority, Brian "Paco" Alvarez. I delivered a photo of the painting to his office. Upon viewing the photograph of the painting, Alvarez said that he thought he remembered seeing it in the files. He promised to dedicate some time in the search. Alvarez also suggested I speak to Dennis McBride curator for the Nevada State Museum. He might have more answers for me.

I spoke with Dennis McBride, told him the tale and arranged to bring the actual painting in for his perusal. A few days later I was lugging the carton that housed the canvas into his office. We laid the piece out on the open space of linoleum flooring. Mr. McBride looked at the piece from various angles than knelt on the floor, bent over and pulled an edge close to his nose and exclaimed, "It smells like smoke." He suggested we check the work on line of some of the earlier local artists such as Crosby Demoss, famous for his paintings of poker playing dogs and local artist, Joey Skilbred from the 70s, but neither panned out. We searched web sites of well-known Hollywood portrait artists such as Don Bachardi but, again with no luck. McBride suggested I speak to the members of Classic Las Vegas, a group that it valiantly attempting to save some of our older buildings such as the old movie theatre and landmark, the Hunt ridge.

I took Mc Bride's advice and fortune smiled again. The group was gathering for a barbecue and annual meeting the following week. I quickly joined the organization as their mission rang true to my homesick heart. The next weekend, chiaroscuro painting in tow and bottle of wine in hand, I attended the meeting.

I eventually brought up my research project and the dozen folks in attendance were intrigued and invited me to bring it in from the car. The canvas proved to be about a foot or two longer than the pool table we laid it across. Most of the members began trying to guess the identities of the movie stars. At that point, I was not positive of the identity of at least four of the stars. By the time I left the meeting, I had been assured that the mystery would be solved. The group is part of other art groups and they have several web sites with thousands of people interested in Las Vegas who "blog" constantly. I would need to have a better photograph taken of the painting so that they could upload it on their web-sites along with the story.

A week later, at the Las Vegas Springs Preserve, I attended a lecture about our atomic age here. The founder of the Classic Las Vegas group, Lynn Zook, who now resides in Reno, was a speaker at the forum. I was following up on an article from a 2007 article in the City Life newsweekly about Classic Las Vegas and Zook's efforts to preserve Nevada's past. The article, written by Andrew Kiraly, described Zook as a "historian and documentary filmmaker."

After the fascinating lecture, McBride, who was also in attendance, introduced me to Lynn Zook. She heartily agreed to aid me with blogging access to her vast membership. Members of CLV were there and more offers to put my story along with a photo of the painting on websites was offered. A professional photographer there, Joel Rosales, offered his services to me, gratis. Within 48 hours, a great photograph of the painting and the story of the artist was available for viewing on-line by anyone who visited his or her websites.

I contacted archivist, Edward Comstock of the Cinematic Arts Library at USC, (University of Southern California), and e-mailed him a copy of the picture. Comstock was unable to find a connection with the style of the artist and that of a known artist or art directors of the last 20-40 years in the short time available to him.

The select parade of film legends and celebrities in the painting always lead me to wonder why them and not other great artists of their era. This idea helped to support my theory that there were more pieces painted like the one in my possession, but with other film artists. I was able to contact former Lt. Governor of Nevada, Dr. Lonnie Hammargren who has a vast collection of Nevada memorabilia in his personal museum. I had often wondered if he might have a signed sister-piece in his collection. But, much to my disappointment, he said he did not.

Bloggers continued to aid me with the identity of the artists. Many remembered seeing the painting in a casino, but none could recall which one. I wondered if I would ever uncover the mystery when I got a call from an excited Joel, the photographer. He wanted to know if I'd checked my e-mail that day. He told me the paintings original location had been discovered!

Following through with his promise to me, Paco Alvarez, of the LV News Bureau, showed the photo around to people. When he showed the photograph to his father, Jose Alvarez a long-time resident of Las Vegas, he recognized it immediately, along with its location. Mr. Alvarez had been an employee of the MGM Grand from the time it opened, to the date of its tragic fire and again once the hotel was rebuilt. He had also spent many an enjoyable afternoon viewing classic MGM films in the plush movie theatre. The painting hung just outside the entrance

to the movie house. The MGM Grand Hotel and Casino opened December 5, 1973 and the disastrous fire that killed 87 people occurred almost seven years later, November 21, 1980.

Hotel mogul Kirk Kirkorian hired famed architect, Martin Stern Jr., to design the MGM Grand megaresort. LA Times Staff Writer, Myrna Oliver wrote the Stern was the man "... who in the mid-20th century designed a significant chunk of Las Vegas' skyline ..."(Oliver 1).

Public Affairs Director, Yvette Monet of the new MGM Hotel informed me that most of the infor-

mation and records had been destroyed in the fire. Any remaining items had been donated to the Special Collections Department in the UNLV Lied Library. Coincidentally I had already gone through most of the collection. I checked the blue prints and discovered that the movie theatre had been located in the rear near the jai alai courts. Sadly, the particular page that would have shown the painting's exact location was missing. Perhaps the decorators had taken it back to their office for revision and it was never replaced. I am still trying to locate the company.

CONCLUSION & FUTURE RESEARCH

I still have not discovered the artist, but will not give up my search. I met Dr. Lonnie Hammargren in person and told him the painting's original location was the MGM Grand Hotel and Casino. The painting had somehow survived the fire. Every year on Nevada Day, at the end of October, Dr. Hammargren opens his museum to the public. He offered to let me unveil my painting to the public in his museum on Nevada's special day. Of course I agreed.

I have a tangible piece of Las Vegas history that won't be imploded or thrown into a scrap pile. I look forward to it being displayed where others who embrace the pasts of Las Vegas and the film and casino industries can enjoy it. I will endeavor to

write a fictional film noir screenplay about the painting and its origins. I'm grateful that UNLV and the Lied Library's Special Collections had a plethora of Nevada history for generations to come to mine and discover on their own.

Figure 1: Original Chiaroscuro Portrait



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A STRANGE ATTRACTOR IN THOMAS BERNHARD'S HELDENPLATZ

BY AVA BOOKATZ



INTRODUCTION

Twentieth century Austrian playwright and intellect, Thomas Bernhard, thought of himself as a *Störenfried*, “a troublemaker, an eccentric, a disruptive force in his family” (Dowden xi). Bernhard is best known as “one of the German language’s most challenging and original postwar writers” (Dowden 1). Thomas Bernhard’s 1988 play, *Heldenplatz*, was “his final published drama” (79). Bernhard wrote *Heldenplatz* to commemorate the fiftieth anniversary of the Anschluss, the 1938 annexation of Austria by Nazi Germany, and the hundredth year anniversary of the Vienna’s *Burgtheater* (79). The play revolves around the Jewish Schuster family who, “lured by academic positions and Vienna’s cultural life, returned from English exile in the 1950’s” (Naqvi 408-409). Bernhard’s *Heldenplatz* caused uproar because it addressed “Austria’s complacent cultural perception” (Konzett 49).

Quite frankly, Bernhard’s writing style is interesting because he “injected a little chaos into the regular order of things” through his texts (Dowden xi). His chosen topics have never shied away from controversy. *Heldenplatz* focuses on controversial topics by embracing themes of madness, illness, past oppression, and suicide. Austria’s media denounced the play “before its premier” and it caused such uproar that it turned Austria into a Staats theater, a political-theater (49). The play was a “disappointment” for its intended audience, since it insulted the very body of people who came to view it. As it caused a political

controversy, the play remains true to Bernhard’s style of writing (49).

LITERATURE REVIEW

Thomas Bernhard’s style of writing has been characterized differently by literary critics. Mark Anderson describes it as “a stream of prose, unbroken by any paragraph or chapter markings” that “circles around the themes of illness, death, madness, and artistic or intellectual ambition” (Anderson 120). Stephen Dowden describes the prose as “Bernhard’s musical style” which remains “always stripped of punctuation and printed on the page with appearance of verse” (Dowden 71-72). Furthermore, literary critic Peter Demetz states Bernhard’s plays are characterized by “monstrous monologues.” Bernhard allows “one or two protagonists” to “dominate the scene absolutely” in his plays. These protagonists seem to ignore the other characters within the scene by merely taking “cues from others while never responding to the dialogue” (Demetz 207). From these descriptions Bernhard’s style allows monologues to flow for an extended period of time.

Bernhard’s prose appears uninterrupted and sound to Anderson and Demetz, since they agree on it being characterized by long running monologues. In *Heldenplatz*, the considered study is focusing on how strange attractors interrupt the monologues of the protagonist in Act One. A widely known paradigm has previously been utilized in applying an element of Chaos Theory to literature. It was discovered by

Edward Lorenz who made a minuscule change in the numeric value of the numbers he used in his weather predictability program (Briggs and Peat 68). In literary works Chaos Theory is used to determine relationships between, "fate and free will, reduction and holism, and the trustworthiness of human perception" in literary texts (Polvinen 46). Chaos Theory may be utilized to demonstrate how strange attractors cause movements of the protagonist's monologues in Act One of *Heldenplatz* to change through interruption.

To demonstrate how strange attractors work to move dialogue in Act One, a glimpse of *Heldenplatz* will be discussed at this time. *Heldenplatz* was performed at the Burgtheatre in Vienna, Austria. It was staged near the historical ground, *Heldenplatz*, where the Nazis had their rallies to gain support for the Third Reich after the Anschluss, the annexation of Austria by Hitler on March 12, 1938. The Burgtheatre is located near *Heldenplatz* and the play uses the location to stage its action. *Helednplatz* begins on March 1988 after the death of Professor Josef Schuster, who jumps to his demise on the fiftieth anniversary of the Anschluss. There is a connection to the date since the Professor commits suicide on the fiftieth anniversary of the Anschluss. His wife, Hedwig, known as "Frau Professor" survives him, but she remains in a constantly tormented state. She hears the cries of the people rallying together in support of Hitler on *Heldenplatz*. The Professor had stayed in Oxford for a time and it seemed that Hedwig recovered away from the residence, but the entire family returned fifty years later because Professor Schuster did not apply for citizenship in Oxford, "Ich hätte die englische Staatsbürgerschaft nicht zurückgeben sollen das war der Fehler" "I did not return my English citizenship, it was a mistake" (Bernhard 44). After the return, Hedwig had been institutionalized a number of times and even received electric shock treatment in the hopes of curing her. The family consists of other survivors as well. Professor Schuster has a sickly brother, Robert Schuster, two daughters Anna and Olga, and a son Lucas. They are employed in academia. The Schuster family has had two loyal house servants, Frau Zittel the head housekeeper and Herta her helper, whom care for Hedwig and maintain the residence near *Heldenplatz*.

Yet Frau Zittel is the main protagonist in Act One. Frau Zittel has spent a considerable amount of time with Professor Schuster before his death. Frau Zittel

repeats throughout Act One the dead Professor. Interestingly, she reiterates his two main ideals, his perfectionism and how he judges others' work from his ideas of perfection. One relative, Professor Schuster's daughter, Anna, refers to Frau Zittel in Act Two as "sein Geschöpf" or his [Professor Schuster's] creature (Bernhard 73). She refers to Frau Zittel in this manner because the Professor has molded her into his perfect servant-companion. She constantly repeats the memories of her time spent with Professor Schuster. Patterns of repetition, like those exhibited by Frau Zittel, are part of the paradigm of strange attractors.

Lorenz's research project demonstrated how strange attractors cause disruption in a system sensitive to initial conditions (Briggs and Peat 68). This theory displaces the old paradigm of Newtonian determinism of "physical law" in which "the laws of motion provide a bridge of mathematical certainty" (Gleick 12). Lorenz decided to round off the equation to three decimal places instead of six, which reduced the decimal places through approximation. One could extrapolate that rounding the number would have produced the same results, since the numbers essentially keep almost the same value. However, it transformed predictable results into an entirely new manifestation. Instead of the predictable weather system that Lorenz expected to find, he found that the system changed as a result of "the microscopic three-decimal-place difference." The difference transformed the weather predictability system into "two computer runs" or two reiterating loops (Briggs and Peat 69). The results demonstrated that complex nonlinear dynamic systems, such as the weather, must be so incredibly sensitive that even the smallest detail can affect them. Like the Lorenz weather system before the approximation, the monologues of Frau Zittel exhibit repetitive behavior, causing Frau Zittel in Act One as system sensitive to initial conditions.

Frau Zittel recalls again and again Professor Schuster's emphasis of Russian writer's, Leo Tolstoy's, works. She remembers how the Professor states that reading Tolstoy to her mother would be a good therapeutic measure (Bernhard 12). She repeats how Hedwig became calm when she hears Tolstoy read to her (33). Frau Zittel discusses with Herta how the Professor believed she never understood Tolstoy's philosophy (34). Frau Zittel states that the Professor said his wife has given him no word of

Act One of *Heldenplatz* demonstrates how the pulls of strange attractors cause movement within monologues. The strange attractor in Act One appears as the short, concise dialogue of the lesser, static character, Herta. Here, Frau Zittel and Herta are clearing out the residence of Professor Schuster, located near Heldenplatz. The image Frau Zittel creates focuses on the Professor's suit and how it held up through his suicide. It is interesting that she hyper-focuses on "eine kleines Loch in der Weste" "a small hole in the vest" and exonerates the performance of the suit (Bernhard 11). This image is significant because she imitates Professor Schuster's habit of analyzing objects and persons through the quality of performance. She cannot believe how well the suit performed during Professor Schuster's suicide. The smell of the suit starts the verbal movement of Frau Zittel's monologue and she falls into a repetitive pattern.

According to literary critic Bruce Kawin images in dialogue only last a short time, "An image has presence but not duration" (Kawin 110). Therefore, Frau Zittel repeats imagery to preserve the mental impression. From this pattern one could extrapolate that the entirety of the play would consist of Frau Zittel repeating Professor Schuster, if she were not constantly interrupted by Herta:

[Herta] Die Frau Professor nimmt mich nach Neuhaus mit.

[Frau Zittel] Sie braucht dich ja
ich hab ihr eingeredet da sie dich braucht
Zu Weihnachten ist sie die ganzen Tag im Bett
Oder auf der Terrasse untätig
Sie liest auch immer dasselbe (Bernhard 14)

[Herta] Frau Professor takes me to Neuhaus with her

[Frau Zittel] She needs you
I have convinced her that she needs you
All day she lays in bed during Christmas
Or passively on the Terrace
She always reads the same book

Here, Frau Zittel's speech revolves around what pertains to Herta and how Frau Zittel has secured Herta's position by influencing Hedwig to need her. Herta's comments within the dialogue redirect Frau Zittel's thoughts through their randomness. It does not seem like Herta purposefully redirects, but the interjections do draw Frau Zittel's attention away from her focus.

Whenever Herta interjects, she changes the movement of Frau Zittel's thoughts to past, present, future or subjunctive. Her interruption changes the linearity of Frau Zittel's thoughts. Herta interjects, "Ich wollte sie ja in Steinhof besuchen" "I wished to visit her in Steinhof [sanitarium]" (14). Herta wanted to visit Hedwig when she was institutionalized. By Herta referring to this event in the subjunctive, it causes Frau Zittel to reflect upon it. Hedwig's history becomes important and Herta's job security is no longer a topic. Frau Zittel recalls how Hedwig refused her as a visitor, even though she brought with her tempting English crême pastries (14). Herta takes Hedwig's avoidance of visitors offensively, since she states "Die Frau Professor hat etwas gegen mich" "The Frau Professor has something against me" (15). Frau Zittel changes her reflection back to the present on account of Herta's abrupt statement. Frau Zittel now concerns herself with Hedwig's present health and focuses on how Hedwig refuses to eat and how pale she has become in the face (15).

Herta makes a great strange attractor because she has a narcissistic quality in her. She speaks mostly about what pertains only to herself, such as how she going with Hedwig, how Hedwig does not like her and how she has something against Herta (14, 15). It is interesting to note how Herta engages past, present and future as a way to disrupt Frau Zittel's thoughts. Bernhard uses Herta as a way to break up monologues. When one considers Herta, the strange attractor, one actually discovers that Frau Zittel's monologues in Act One are not as monolithic as they seem because of how they change direction in time through Herta's interruption.

Herta interrupts Frau Zittel's thoughts through blunt statements, "Die Frau Professor mag mich nicht" "The Frau Professor doesn't like me" (15). This forces Frau Zittel's need to respond. She tells Herta, "Sie mag dich genauso wenig wie mich" "She likes you as little as she likes me" (15). Frau Zittel changes her topic from the Professor's concept of performance, where she began her speech to the sad, present condition of Hedwig because of Herta's interruption:

Es gibt so viele die nie geboren werden hätten dürfen
Mit diesen Menschen mu ß man behutsam umgehen
Aber die lassen einen das gar nicht
Sagte der Professor immer

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Es gibt so viele die nie geboren werden hätten dürfen
Mit diesen Menschen mu man behutsam umgehen
Aber die lassen einen das gar nicht
Sagte der Professor immer
Diese Menschen machen immer alle und alles kaputt (16)

There are so many who should never been permitted to be born
One must cautiously avoid these people
But they don't let one avoid them
Always said the professor
These people always finish and everything is ruined

Here, Frau Zittel begins again with the Professor's opinion about people. He examined everything based on performance. It is the same method she employed when she examined how well the vest held up during the Professor's suicide.

Frau Zittel always returns to her point of origin through her predictable pattern of repetition, while she explicates to Herta how obsessed the Professor was with details. He was afraid to allow others to clean his personal items, in case they made a mistake:

Das ganze Leben hat sich der Professordie Schuhe selbst geputzt
die Schuhe durfte ihm niemand putzen
The Professor has his whole life, cleaned the shoes himself
he permitted no one to clean the shoes (16)

She goes on about the shoes and even criticizes Herta's attempt at cleaning. Herta then distracts Frau Zittel from her pattern, "[Herta] Der Professor hat mir versprochen mich nach Graz mitzunehmen" "The Professor promised to take me with him to Graz" (18). Herta changes the direction of Frau Zittel's monologues towards herself. She interrupts Frau Zittel's repetition with another of her concise statements. Frau Zittel responds to Herta by saying that if

she had went, then she would have been miserable. She would have stayed in a small, stuffy darkroom in Erzherzog Johann, a 16th century hotel in Graz, Austria, and carry around the Professor's coat the entire time (18). Frau Zittel's movement in time travels from past to subjunctive. By Herta focusing selfishly on what only pertains to her future, she changes the linearity of Frau Zittel's focus.

Now, Herta decides to focus on the present and bring Frau Zittel's focus to the present through her examination of the grotesque:

[Herta] Der Kopf ist
[Frau Zittel] Das hast du jetzt schon hundertmal gesagt
das der Kopf ganz zerquetscht gewesen ist
[Herta] The head was
[Frau Zittel] You have already said that a hundred times
that the head was all squashed (19)

Again, Herta distracts Frau Zittel from her predictable focus by referring to how the Professor's head looked after he jumped out of the window. She changes the linearity of focus. Frau Zittel begins a comparison of the Professor's health and his sick brother, Professor Robert. It seems that Frau Zittel attempts to return to return to the past, but there is a tremble of disturbance in her manner of comparison. She cannot return to the exact pattern, because Herta has emotionally disturbed her through her reference.

CONCLUSION

The strange attractor, Herta, creates change in Frau Zittel's monologues, a system sensitive to initial conditions. Frau Zittel's words, reiterating the Professor's thoughts, appear as a repetitive system system, but through Herta's constant interruption, one sees that Frau Zittel's speech is redirected. Frau Zittel self-reflects images back onto one another, and ultimately return to the point of origin, the thoughts and opinions of the Professor, "ich bin ja genau Frau Zittel aber nicht verrückt" "I am only exact Frau Zittel but not crazy"(16).

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THE CORRELATION BETWEEN PARTICIPANTS IN SPORTS AND MUSIC AND HIGH ACADEMIC PERFORMANCE

BY VACHERAL M. CARTER



INTRODUCTION

During this time of recession it has become increasingly important for music educators to be able to advocate for their programs to save them from being eliminated with the different budget cuts school districts are forced to make. A recent survey regarding possible future budget cuts posted by the Clark County School District states, "A reduction in district operating funds will necessarily have an impact on existing programs, projects, or services," (CCSD, 2008). Among the programs listed for budget cuts and/or elimination were various co-curricular activities such as athletics, speech, drama, band, orchestra, and choir. Elementary music teachers and high school conductors alike must be able to show how music helps their students succeed where other children often fail in school. Fortunately for music educators, several studies have already been completed to help them defend their case. The purpose of this study is to replicate one such study previously conducted by William Shropshire in metro city Georgia. It would thus answer the question: Are Shropshire's findings applicable to school districts in the West as well as those originally studied in the South. This study would benefit not only teachers by giving them studies with which they could defend their programs, but it would also benefit students by protecting the very activities that encourage them to excel in the classroom. By replicating Shropshire's study, we will also support or detract from the ultimate versatility of his original results.

LITERATURE REVIEW

Over the years, various studies have been completed that broached the subject of the possible influence of studying music on a student's academic performance. The studies range in methodology from Likert scale questionnaires to quantitative assessments of students abilities in class. This section will examine a few of the articles that study the correlation between music and academic performance. John Tanner's research is a perfect example of that.

In his article, "Participation in Music Education and Student Academic Achievement at Grade 10," John Tanner investigates whether there is a correlation or a possible correlation between students studying music and these same students earning higher math and language scores than the average student population. After requesting permission from the biggest school district on the West Texas border to access the students' records, Tanner compared the scores of music students and non-music students on the Texas Assessment of Academic Skills test. The Texas Assessment of Academic Skills test is a state mandated test that measures the students' performance in subjects such as science, reading, mathematics, social studies and English language arts. Tanner chose to utilize the mathematics and English language arts sections of the exam for the purposes of this study. Using the statistical program for Social science pc version 14 to analyze the answers to the research questions and an analysis of variance pro-

cedures to discover the influence the students participation had on their TAKS scores, Tanner was able to successfully conduct his study. The data revealed that there was a positive correlation between the students studying music and their elevated test scores. Tanner's research suggests that when students study music, they score higher on standardized tests than students who do not study music. Tanner is not the only scholar who has researched this topic.

Mary Meeks Nguyen follows a similar course of study in her article "Math + Music Program: Teacher Perception of its Effect on Student Growth." She, like Tanner, ventured to gain information on whether or not studying music positively influences students' math, language arts, arts, physical education, self control, self-esteem, and self regulation skills. Using a Likert-scale questionnaire, Nguyen polled the teachers' perceptions of student production in the classroom. She soon found that, according to the teachers, all of the aforementioned areas with the exception of physical education were in some way enhanced by students studying music. The area that was the most influenced by musical study was mathematics. Teachers and technicians alike tended to agree that their music students excelled in this area. On the other hand, when the same group was asked about their students' language arts achievement skills, they tended to remain neutral. Though there was a lower correlation between language arts and musical study, all the teachers agreed, that studying music positively affects various areas of the students' lives. This, they concluded is especially evident in the area of mathematics.

In her article, "The Effect of Music Instruction on Student Success in the Age of High-Stakes Testing and Accountability," Roxana Gonzalez Linan also explores this topic. However, unlike Tanner and Nguyen, Linan focuses on the effect that music has on students grades K-12. Her data gathering technique was both quantitative and qualitative. In the quantitative portion, Linan examined the Texas Assessment of Knowledge and Skills test scores of students who were enrolled in music appreciation classes and compared them with the scores of students who were not enrolled in music appreciation. She also conducted open-ended interviews of various music educators, non-music educators, administrators, and school board members. Linan soon came to agree with Elliot Eisner who believed that

music must be a part of students' learning in order to provide them with the richest education possible.

Andrea Michelle Peoples-Marwah followed this line of thinking by studying middle school students in her article "A Study of the Effects of Visual/Spatial and Musical Intelligences on Sixth Grade Ohio Proficiency Test (OPT) Math Scores." Using a tool called the MIDAS-KIDS which measured students' interest in musical ability and the Ohio Proficiency Test, she was able to gauge whether or not the students' math scores were possibly influenced by their interest in music. She found that the students who took part in instrumental exercises earned a higher score on average than the students who did not. She thus concluded that schools in general would have better academic skills and better testing results if they incorporated musical interests into the curriculum.

Barbara Helmrach takes this idea to a whole new level in her article "In concert: The Relationship Between Middle School Formal Music Instruction and Adolescent Algebra Achievement." Helmrach suspected that not only is all education benefited by the study of music, but that the math concentration of Algebra was specifically enhanced by musical study. By conducting a study in which she analyzed the first time High school assessment scores of 2006 8th graders and 2007 9th graders, the 2003 Maryland School Assessment mathematic scores, the type of musical instruction the student received in middle school, and finally the students' race/ethnicity, Helmrach states that there may be the possibility that students' participation in instrumental music in their middle school years helps strengthen the cortical connections to the area of the brain used to solve algebraic equations. She therefore poses the theory that students' performance in introductory algebra may be enhanced if they were encouraged to play in instrumental ensembles during their middle school years.

The benefits of music education are not solely restricted to the academic arena however. In her article, "Music Education and Mentoring as Intervention for At-Risk Urban Adolescents: Their Self-Perceptions, Opinions, and Attitudes," Christina Shields sets out to show how music education can also be used as an aid for redirecting at risk adolescents in urban areas. She set up a field experiment program in which students who had been identified

by their homeroom teachers as "at risk" participated in various music, art, and dance classes throughout the school year. Afterward, both they and their parents were interviewed in order to get their reactions. At the end of the study, students declared that music had become an important part of their lives and their scores on the self concept portion of the interview improved. Shields thus concluded that music education and music educators do more than just help students academically, they have the potential to play an important role in their students' lives as a whole.

A perfect example of music helping at risk students can be found in Deloris Wallace Bennett Brown's article "The founding and Evolution of a School for the Boys Choir of Harlem: Choir Academy of Harlem." Using a historical form of research, Brown explores the roots of the Boys Choir of Harlem. By conducting research through interviews, newspaper articles, journals and dissertations, she soon discovers that this program impacted its participants and that over 85% of their class graduated from high school. Since musical study tends to help students improve both personally and academically it stands that music education programs should be treated as necessities to education rather than economic liabilities.

William Brent Shrophire takes the affirmative in this argument in his study "Differences in Student Academic Achievement Between Students Who Participate in Music Programs and Students who participated in Athletic programs." The purpose of his study was to determine if there is a big difference in the academic achievement of students who participate in music, in sports, or in both. By conducting a quantitative inquiry and comparing the critical reading and mathematics sections of the PSAT and the Georgia High School Graduation Test, Shrophire discovered that testing scores were the highest for students who participated in both athletics and music rather than one or the other. He goes on to argue that if such extra-curricular activities help students excel in the classroom, they should not be faced with extinction every fiscal year.

The purpose of this study is to replicate Shrophires' study in the western region of Nevada and thereby determine whether there is a correlation between student academic achievement and their participation in co-curricular activities. The questions that this study will examine are: 1) to what extent does the study of music enhance students' performance

in the classroom and; 2) is there a statistically significant difference between the test scores and Grade Point Averages of students who participate in music, sports or both. This study will be testing the following hypotheses: 1) music education does help students excel in the classroom and; 2) that students who participate in both athletics and music will do better academically than students who only participated in one or the other.

METHODOLOGY

The sample group of this study will be the junior and senior classmen of a high school from the urban area of Nevada's largest school system, the Clark County School District. Bonanza high school will be the subject. As of 2008, Bonanza has an upper classmen population of 841. There are currently more male students than there are female students. I plan to use the students' proficiency scores and their PSAT scores as the instrument. I will also request that along with the students' scores, the school district also provide general information about what musical or sports program in which the students are involved. I would then use this data and compare it to students who are not involved in such activities and use it to either support or refute the aforementioned hypotheses.

CONCLUSION

In our current economic recession, many tough decisions will need to be made especially in reference to how our children are to be educated. Budgets will need to be trimmed and programs will be eliminated. By reconstructing Shrophshire's study, it not only supports the versatility of his conclusions, but it will also encourage education administrators to continue to support extra curricular activities as academic motivators and enhancers for students. As change sweeps through school districts across the country it is imperative for coaches and conductors alike to be able to stand and successfully defend their programs in order to provide the well-rounded education that students deserve.

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“TREASONOUS ACCULTURATION:” THE LEGACY OF LA MALINCHE’S BETRAYAL AND ITS EFFECT ON WOMEN OF MEXICAN AMERICAN DESCENT

BY NYDIA DIAZ



INTRODUCTION

The Spaniard's conquest of Mexico introduced many historical figures that continue to hold permanence in Mexico's social consciousness, such as the tragically weak Montezuma, the tragically courageous Cuauhtémoc, and the invincible Hernan Cortés. Amongst and between these powerful male figures stands a lone female, whose history is ambiguous but her reputation is notorious. This figure, popularly known as *La Malinche*, is historically known as Cortés's interpreter and concubine, but in Mexican culture, she is often acknowledged and reviled as the Mexican Eve, betrayer of her indigenous race and mother of the mestizo people. Furthermore, in Mexican and Mexican American society, *La Malinche* has become one of two paradigmatic and iconic cultural images for females, standing opposite of the most pure and beloved Virgin of Guadalupe. The discrepancies between her historical role and popular image can be attributed to the Mexican/Mexican American culture's gender ideology, and the two aforementioned paradigms reflect the attitude towards women that is present in Mexican patriarchal societies. The purpose of this study is to explore the construction of "Treasonous Acculturation," as personified by *La Malinche*, in Mexican and Mexican American society and examine its impact on women of Mexican American descent, especially in the literary works of chicana writers.

LITERATURE REVIEW

CONTENT ANALYSIS

This research is most directly based on Sandra Messinger Cypess's study *La Malinche in Mexican Literature: From History to Myth*, which discusses the intertextuality that surrounds *La Malinche* and her culturally symbolic paradigm. In her study, Cypess explores this paradigm by analyzing Mexican literature from the conquest to the present, focusing on texts that either feature *La Malinche* as a character or use her image as a subtext. Through this literature analysis, Cypess most specifically attempts to describe the intertextuality that has constructed *La Malinche* as a sign of passive sexuality and betrayal. She posits that, as one of the major cultural paradigms in Mexico, *La Malinche*'s image is continually evolving through time; her image changes continually to fit the social and political needs of a continually changing Mexican society. Due to the evolving nature of her image, Cypess considers *La Malinche* a "continually enlarging palimpsest of Mexican cultural identity."

Cypess especially analyzes *La Malinche*'s image and how it shaped the male-female behavioral patterns in Mexico's patriarchal model, an aspect that is especially evident after the initial transformations of *La Malinche* following Mexican Independence. As Cypess demonstrates, this era of independence produced a decisive shift in *La Malinche*'s image due to the shifting national and cultural perspective

away from the glorious conquest towards portrayals sympathetic to the indigenous peoples of Mexico. For example, the Spanish versions of the conquest, especially Bernal Diaz del Castillo's *Historia verdadera de la conquista de Nueva España* (The Conquest of New Spain), painted her in a favorable manner because she was a helpmate of Cortés and became an exemplary Christian; however, during the "national" era after Mexican Independence from Spain, she was seen more commonly portrayed as a betrayer. Thus, based on this definition of native alliance, the first vestige of La Malinche's image as traitor comes to light. Cypess's study did not limit itself to strictly Mexican works of literature, but also discusses the role La Malinche plays in Chicana writing, mainly in the poetry of the Chicana Feminists. Cypess views the revisions of La Malinche as significant, for according to Cypess, the Chicanas see themselves represented in the image of La Malinche, especially in regards to acculturation and its association with the Mexican term "malinchista."

La Malinche's negative portrayal must be understood and historically contextualized in order to understand her important cultural significance. Thus, one of the two main focuses of this research is on the development of her image as betrayer and how this "betrayal" became synonymous with acculturation. This study also discusses how "treasonous acculturation" came to be shaped into sociological construct that is a form of social control; in other words, something created by society in order to control the population and enforce the society's cultural norms, values, and beliefs. This contributes to a greater understanding of the key images surrounding La Malinche, as well as adds another perspective to the ongoing discussions of Mexican and Mexican American patriarchy and the gender constructs that shaped her and vice versa. This study will also add to the discussions regarding La Malinche in Chicana writing, focusing specifically on the aspect of acculturation as it is applied to La Malinche, and by extension, Chicanas.

Camilla Townsend's study *Malintzin's Choices: An Indian Woman in the Conquest of Mexico* is a comprehensive study of the cultures and society that surrounded La Malinche and the historic time period surrounding the conquest, exploring the probabilities of La Malinche's life "in context" with the time period. Very little is actually known of La Malinche beyond that of what is gleaned from contemporary Spanish primary sources. In attempting to recreate the life of

this ambiguous figure through the few concrete facts available to the world, Townsend provides copious notes and citations along with her study about La Malinche. Townsend uses a balance between Nahuatl sources, such as codices, miscellaneous documentation, and her knowledge of the Nahuatl language, and Spanish sources, such as court or legal documents, letters, and conquest accounts to inform her historical biography. Also useful is the focus on La Malinche's progeny; Don Martin and Doña Maria, whom, for all intents and purposes, are often considered the first mestizos. These children are important because how they lived and were treated indicated not only the emergent colonial culture, but also how La Malinche was viewed during the time directly after the conquest, which is pertinent to the discussion and the development of her manifestation as the ultimate icon of betrayal.

Like Townsend, Gordon Brotherston believes in his study that different indigenous nations viewed La Malinche in different ways, for example, the Mexica viewed her in a more disapproving light than the Tlaxcalans. However, despite the different attitudes towards her, each of these nations understood her importance, as the earlier codices that were constructed after the conquest demonstrate through the size and position of La Malinche in the depictions. By comparing these earlier codices to later ones, Brotherston shows a definite shift towards a European cultural lens, not only in the aesthetics of the drawings, but also in their depiction (position, size, attributes) of La Malinche. This demonstrates that as La Malinche becomes more feminine in the European gender system, she is also relegated to a subservient secondary role.

Another pertinent article pertaining to the historical study of the conquest, and most specifically, the politics of the conquest, is Steve J. Stern's "Paradigms of Conquest: History, Historiography, and Politics." Written at the time of the quincentenary anniversary of Columbus's expedition, Stern discusses the "double vantage point of history and historiography" and explores what the conquest means to those who lived it versus those who interpret it later on. Another important point that is pertinent to this study is the discussion of the role La Malinche performed that catapulted her into history in the first place, which is that of interpreter. As Matthew Restall iterated on his discussion of the myth of communication/miscommunication in his book

Seven Myths of the Spanish Conquest, by virtue of her role as interpreter, indigenous peoples viewed her as powerful, and although the Spanish thought her important, their failure to mention her, especially Cortés, planted the “seeds of a more derogatory view” towards La Malinche. These seeds would fertilize in the European patriarchal culture, contributing to the image of La Malinche that continues to devalue the importance of her contributions to this day.

Through the metaphor of the bird cage, Marilyn Frye’s sociological essay, entitled “Oppression,” discusses the constructions of oppression; what oppression is, what oppression does, and through this distinguishes characteristics of people who are oppressed. Frye focuses on women as the main example of an oppressed group and cites the existence of the “double bind” imposed on women in patriarchal societies. Frye’s metaphor of the bird-cage is especially enlightening, and provides a different perspective from which to view La Malinche and how her image of ultimate betrayer was constructed. Margo Glantz’s essay “Doña Marina y el Capitan Malinche” provides an interesting perspective on how gender is constructed through the domain of the (mainly male) body within Bernal Diaz del Castillo’s account of the conquest, suggesting that La Malinche can be viewed as having masculine attributes through her relation with Hernan Cortés. Glantz argues that because Diaz del Castillo talks of her in ways that are not feminine, that is, he talks more about her valor, courage, and strength than of her beauty or feminine sensibilities, it could be interpreted as him seeing her in a masculine light. This is opposed by Adelaida del Castillo’s essay *Malintzin Tenépal: A Preliminary Look into a New Perspective* which attempts to demonstrate how significant La Malinche is by relating a comprehensive account of La Malinche’s behavior after carefully considering seven given historical accounts. In this essay, Castillo disputes that La Malinche is not a “macha,” or a woman who takes on male characteristics and attributes, and since she does not conform within a masculine form, she is thus demeaned and devalued by the prevalent misogynistic attitude in patriarchal culture. These two essays are important because they discuss patriarchal gender constructions and how it plays a central part in the discussion formulation and construction of treasonous acculturation.

Perhaps the most important essay discussed is Octavio Paz’s “The Sons of La Malinche,” a philosophical treatise that not only identifies La Malinche with La Chingada, but also psycho-analyzes the male-female gender constructions found in Mexican culture’s “machismo.” Through an analysis of the phrase “¡Viva Mexico, hijos de La Chingada!”, and of the verb “chingar” in particular, Paz rightly distinguishes certain patterns of gender construction in Mexico’s patriarchal society, especially that of the dominant aggressive male, *el chingón* and the passive submissive female, *la chingada*. This binary, however, promulgated a view of women, and of La Malinche, that continued to debase, objectify, and to a certain extent dehumanize them. When Paz asserts this binary, he essentially claims that to be a chingada is in the very nature of the women’s sex by reason of their sexual organs. Through this reasoning, Paz continues to perpetuate the dominant Patriarchal ideology of a binary construction of gendering; emphasizing the different physiological traits each human is born with. This, as Judith Lorber demonstrates in her essay “‘Night to His Day’: The Social Construction of Gender,” promotes a perspective that views the actions of “men” and “women” as inherently different.

Chicanas too, must be understood and historically contextualized in order to understand how they are connected to La Malinche and her image of betrayal. As Alma M. Garcia relates in her introduction to the compilation of historical chicana writings, *Chicana Feminist Thought, El Movimiento*, that is, The Chicano Movement, arose at a time in which the United States experienced an uprising of civil rights protests from movements of various marginalized groups in society, most notably from African Americans/Blacks and Women. Uniting under the rallying cry of cultural nationalism, “Chicanismo,” the movement “focused on social, political, and economic self-determination and autonomy for Mexican-American communities throughout the United States.” However, as Mary Louise Pratt succinctly stated, “Like all modern nationalisms, ethnic or otherwise, the Chicano movement was masculinist in its conception and tended to unreflectively reproduce subordination of women.” As the writings within the collection *Chicana Feminist Thought* demonstrates, the Chicana’s often struggled to attain their own civil goals in a movement that espoused the continuation of traditional cultural norms, beliefs and values. The Chicana Feminist movement that arose from these struggles saw itself as a separate entity, for neither

the Anglo Woman's Movement nor the masculine Chicano movement acknowledged the specific issues that faced Chicanas for being twice a minority. Loyalist Chicanos, in response to the Chicana feminist, saw feminism as an "Anglo thing," and as Anna Nieto Gomez elucidates in her article "La Femenista," the Chicana feminists were polarized by this view of feminism, and were often called sell outs by the loyalists for the femenistas actions. In light of these accusations and attitudes, Chicanas began to see themselves reflected in the image of La Malinche. Thus, as Mary Louise Pratt demonstrated, Chicana's began to write essays and poems about La Malinche in ways that not only redefined La Malinche, but also explored and defined their own sense of place and identity within their own culture.

Pertinent to the discussion of acculturation is Julia Lechuga's study on acculturation as a dynamic construct. In this study which was conducted in a university near the Southwest border, bilingual students were tested for the affects of priming culture on acculturation. Drawing from the theoretical tenet which affirms that acculturation, like culture, is a malleable and dynamic construct, Lechuga conducted two studies to test the effects of priming culture on bicultural subjects. The studies proved that a priming procedure worked, especially in the study which used language as the priming method. This study was influential in the exploration of what acculturation is and how it works, which provides a basis for the discussion of how Mexican and Mexican American cultures define acculturation, especially in regards to gender. These social definitions will be discussed later through an analysis of Mexican and Mexican American literature.

Manuel Peña's sociological study on the connection between the "treacherous women" of Mexican folklore, the ideology of machismo it represents, and the class conflict the folklore displaces provides concrete evidence as to how La Malinche and Mexican American women are inherently tied to one another and to the construct of acculturation. Peña argues that machismo ideology, "derives its power... from the extreme economic exploitation... deprivation and alienation," that the Mexican men have been subjected to by capitalist society's dominant class. His study of various charritas coloradas (red jokes), collected during his fieldwork working at an "agribusiness" near Fresno alongside Mexican immigrant men, elucidates as to how the men use the charritas coloradas as a "cultural

strategy that, through a crucial process of ideological displacement, shift the point of conflict from the public domain of class relations between men to the private domain of domestic relations between men and women." Peña argues, then, that the Mexican men debase the women in these jokes in order to compensate for the economic exploitation they are assaulted with. The charritas coloradas and the discussions Peña had with the Mexican men elucidate the attitudes the men have towards Mexican Americans, and particularly Mexican American women, whom are often correlated to the "treacherous women" in the charritas (and by extension, La Malinche) because they are considered to be "libertinas" or "loose and independent" due to their acculturation to American society. Mexican women, on the other hand, are considered superior to there American-born counterparts because of their adherence to traditional patriarchal ideologies, which encourages deference to the male authority.

Ana Castillo's literary work *The Mixquiahuala Letters* also relates this concept of "liberated" Chicana and "traditional" Mexicana. Amongst the short letters that comprise the narrative, there are a set of letters that describe a journey into Mexico's southern Yucatán peninsula and the trials, the hassles and the harassment the protagonist and her friend faced for being foreign women, and especially for being a woman of Mexican American or (Latin, as in the case of her friend) descent. Often treated in a derisive manner by men, and frequently equated with sexual objects, the two women were constantly attacked by the constructs of machoistic Mexican society that looked askance upon women of Mexican descent who wore jeans, which in the story came to be equated as a sure sign of acculturation. This binary image of the preferred "traditional" woman versus the "liberated" Mexican American woman is also found in the socio-historical fictional narrative of *The Adventures of Don Chipote* by Daniel Venegas. Written for a newspaper in the 1928, this novel depicts the struggles Mexican immigrant men, known in the narrative as "Chicanos," faced in American society during that era. Amongst the many experiences described in the narrative are the interactions between the Mexican Americans and the immigrant "Chicanos." Although Venegas looks askance at Mexican American men, his treatment of Mexican American women fares worse; derisively calling the one Mexican American female character a "flapper," he depicts her as being loose, while the other female character, Don Chipote's Mexican wife Doña Chipota,

is celebrated for the “traditional” Mexican values she represents.

The chapter “Never Marry a Mexican” in Sandra Cisneros’s collection of short stories *Woman Hollering Creek* is an internal monologue by the protagonist Clemencia, who’s life story parallels La Malinche, thus irrevocably connecting her to the image to this iconic female. According to Jean Wyatt, while Clemencia acts out against the image of sexual passivity that La Malinche represents by taking on the role of Paz’s chingón versus the passive role of La Chingada. By being sexually aggressive, Clemencia essentially tries to break away from La Malinche’s image and the gender constructs of Mexican patriarchy she represents; however she merely inverts the model and perpetuates the culture’s gender roles and the gender binary. Although she culturally isolates herself from Anglo and (especially) Mexican/Mexican American cultures in order to redefine herself, her actions and the gender model they follow prove she does not break free from the traditions of her ethnic heritage and all its constructions. Clemencia’s internalization of the popular image of La Malinche demonstrates her inability to recast or transform La Malinche’s image, and by extension herself, placing her in opposition of the Chicana feminists.

Denise Chavez’s novel *Face of An Angel* also discusses the perpetuation of gender roles in Mexican American society, but discusses it through a narrative that focuses on the Dosamantes family, and most specifically the Dosamantes women. Through the female characters, as related through the memories and interactions of the protagonist Soveida Dosamantes, Chavez discusses the role of women in Mexican American society, who are often relegated to a “service” role for the men in their lives. The men (Mexican American men or otherwise) in Soveida’s life all expect her to fulfill this submissive role as “servant,” whether it be as wife or as waitress at the restaurant “El Farol.” However, unlike Clemencia, Soveida does not repudiate Mexican American culture; instead Soveida comes to acknowledge the passivity of service as an inheritance passed on through the women, thus recognizing the power women have over a culture that seeks to take their power away. Through this realization, Soveida comes to terms with her cultural inheritance and chooses to take control by redefining motherhood (thus herself and the passivity as represented by La Malinche) in her own terms, outside of the ideals of

Mexican American Patriarchy.

As Townsend and Brotherston demonstrated in their respective studies, although the historical figure of La Malinche was well respected while she was alive, the emergent Mexican patriarchal culture began to transform her significance and her character in order to fit her into their contemporary cultural lens. With the advent of Mexican Independence however, La Malinche’s image underwent a complete transformation and became a negative signifier of betrayal for women, an image that, as Cypess demonstrated, continually changed to fit the needs of a society that is not static in nature. As Octavio Paz’s essay revealed, La Malinche’s transformation has very much to do with the rigid gender roles of Mexican Patriarchy, which judges a woman’s character on the nature of her sexuality. In Mexican American culture, Chicanas, in particular the Chicana feminist writers of the Chicano movement, continually have to grapple with the image of passive betrayal of La Malinche due to their acculturation to American customs and their deviance away from the traditional values espoused by Mexican/Mexican American society. This definition of acculturation demonstrates that La Malinche’s person is not the only concept undergoing significant change, for the concept of betrayal underwent a transformation of definition as well. The four narratives analyzed, thus, reflect all of these issues surrounding the construction of treasonous acculturation and discuss not only how others view Chicanas in regards to this construction, but also how Chicanas view themselves.

CONCLUSION

This research was initially designed as a historical analysis of Chicana narratives, with a focus on how La Malinche influences and shapes the literature. However, due to the tremendous influence this cultural icon has in Mexican American society, the research soon included other disciplines outside of history and literature. The disciplines studied to bolster the historical and literary analysis include sociology, ethnic studies, material and cultural history, folklore studies and, to a certain degree, psychology. Taking from Sandra Messinger Cypess’s study on her transformation as a cultural icon, this research attempted to reveal how it was that the historical figure of La Malinche came to be associated with sentiments of betrayal, with a focus on how the natives contemporary to La Malinche viewed her. Of most particular importance to this research was to

develop an understanding as to how gender affected the views on La Malinche and the roles she portrayed during the conquest. Also, this research attempted to discern how acculturation came to connect La Malinche to Chicanas, and by extension, how betrayal came to be associated with the term acculturation.

Essentially, the objective of this research is to define and develop treasonous acculturation as a negative sociological construction used to control women. In order to define this term, a basic understanding of the definitions and implications inherent to the words acculturation and social constructions needs extrapolation. Acculturation is, basically, the process by which a person culturally adapts to the culture of the dominant group, and was used instead of assimilation because of the inherent implication of retaining aspects of the mother culture. The definition of social constructions (of reality) is basically a creation of society of what it regards as true. Thus, treasonous acculturation, as a social construction shaped by the gender binary of patriarchy, is the creation of Mexican/Mexican American society regarding what they believe as true about acculturation in Mexican American women to a non-traditional Anglo culture, following the historical example of "acculturation" as seen through La Malinche and the conquering Spaniards. Thus, through an analysis of La Malinche in Chicana literature, not only are the sociological and psychological implications of her iconic female image made apparent, but it also demonstrates how history, especially the Conquest, continues to reverberate in and affect society today.

END NOTES

1 La Malinche is known by three other names: Dona Marina, her Spanish name; Malina, what Townsend considers to be the Nahuatl version of Marina (in the Nahuatl language, there is no r); and Malintzin, which is Malina with the honorific "tzin" added at the end. Malinche is the Spaniard version of Malintze, "tze" being the shortening of the honorific "tzin" in Malintzin. Townsend, *Malintzin's Choices*, 36

2 Cypess, *La Malinche in Mexican Literature*, 5

3 Cypess, *La Malinche in Mexican Literature*, 13

4 Xicotencatl, published in 1926, is thought to be the first narrative on the theme of the conquest after Mexican Independence, and may provide the first negative interpretation of La Malinche. Cypess, *La Malinche in Mexican Literature*, 43 and 10

5 Cypess, *La Malinche in Mexican Literature*, 12

6 According to Cypess, "malinchista" means "submissive deliverance of nationhood", presumably to a foreigner or to foreign interests. Cypess, *La Malinche in Mexican Literature*, 151.

7 Brotherston, "La Malintzin de los codices"

8 Mesoamerica was composed of many nation/states, called an atepetl, at the time of the conquest. Those we consider "Aztec" actually called themselves Mexica, and they lived in Tenochtitlan, whom along with two other atepetls, formed the powerful Triple Alliance. The Tlaxcalans were allies of the Spaniards. To be aware of this component of Mesoamerican society is to begin to unravel the development of the construction of La Malinche as a betrayer.

9 The earlier codices analyzed in the study are: the Florentine Codex, which is a predominantly Mexica account; the Lienzo de Tlaxcala, the Tlaxcalan account; and other accounts such as the Texas Fragment.

10 These later codices are identified as being the "Codice Entrada de los españoles en Tlaxcala" and the "dibujos de Panes".

11 Like Restall states, this ignorance on the part of Cortés can be understood "in the context of the broader Spanish attitude toward interpreters" at the time. Restall, "The Lost Words of La Malinche" in *Seven Myths of the Spanish Conquest*, 86

12 According to Frye, a double bind is "a situation in which options are reduced to very few and all of them expose one to penalty, censure, and deprivation", pg 3

13 Through this metaphor, Frey argues that you can not see how exactly a person is being oppressed by just focusing on one image, part, or "bar" of the cage of their oppression; you must "step back" to be able to see how the bars connect, encircle, and entrap the oppressed. Using this same kind of logic, the concept of betrayal encircles and encapsulates La Malinche like a cage; its not just one bar maintaining the image, but many bars working in conjunction with one another. Frey, "Oppression", 4-5.

14 Glantz argues that La Malinche and el Capitan Malinche, that is, Cortés, could be seen as one single body or person. As such, La Malinche can be seen as having masculine attributes, and Cortés as having feminine ones.

15 Del Castillo, "Malintzin Tenepal: A Preliminary Look into a New Perspective" in *Essays on La Mujer*, 139

16 This phrase translated is "Long Live Mexico, sons of the screwed woman!" ; The word "chingar" can be translated to mean "to screw over" or "fool".

17 Mary Louise Pratt, "'Yo Soy La Malinche': Chicana Writers and the Poetics of Ethnonationalism."

18 Lorber, "'Night to His Day': The Social Construction of Gender" in *Reading Women's Lives*, 78

19 García, "Introduction" in *Chicana Feminist Thought*, 2

20 Pratt, "Yo Soy La Malinche," 861

21 Pratt, "Yo Soy La Malinche," 860

22 Peña, "Class Gender and Machismo: The 'Treacherous-Woman' Folklore of Mexican Male Workers", 31

23 Peña, "Class Gender and Machismo," 41

24 Jean Wyatt's article "On Not Being La Malinche: Border Negotiations of Gender in Sandra Cisneros's 'Never Marry a Mexican' and 'Woman Hollering Creek,'" offers an exhaustive analysis of Never Marry a Mexican and two other short stories within the collection *Woman Hollering Creek*. She convincingly argues that these three stories serve as an ongoing dialectic on "negotiating cultural icons that are both inalienable parts of oneself and limitations to one's potential as a woman." 266

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IMPACT OF THE KINSHIP LIAISON PROGRAM ON RELATIVE CAREGIVERS

BY KIMBERLY HACKSTOCK



INTRODUCTION

Over the last decade, foster care services within the child welfare system have experienced considerable growth in the employment of kinship care (also known as relative caregivers or kin caregivers) as a preferred solution throughout the United States (McFadden, 2002). Additionally, Clark County's Department of Family Services has experienced the same increase.

Recently, research concluded that, "In 2003, the Children's Bureau funded nine demonstration grants to test the efficacy of a systems of care approach to improving outcomes for children and families involved in the child welfare system" (Children's Bureau, 2008). The Clark County Department of Family Services (DFS) is one of the nine projects that received a grant from the Children's Bureau designed to promote infrastructure change and strengthen the capacity of DFS to support those families with which they are involved.

The Caring Communities Demonstration Project at DFS along with the University of Nevada Las Vegas' School of Social Work Research Department are collaborating on the research that "aims to build a home and community-based system of care to improve the safety, permanency and well-being of children living with kin caregivers"(Denby-Brinson, 2008).

An objective of this project is to increase the capacity of relative caregivers to care for the children living with them through the efforts of paraprofessionals identified as KL; they mentor and educate kinship caregivers, advocate for kinship needs, and through the kinship liaison's networking and collaborating efforts with community providers are able to improve and support kinship caregivers (Denby-Brinson).

Since states' use of relative caregivers has expanded faster than the ability of child welfare policies and practice, to reflect the unique needs of this population, the research presented is essential to aid a previously forgotten populace of caregivers in the foster care system. The preference for and rate of dependency on kinship caregivers should determine the continued need for additional and sufficient tools necessary for kinship caregivers to adequately care for their relative's children.

Above all, knowledge attained from the present research will serve both Nevada and the United States, in that all states are relying more on relative caregivers for familial continuity. As well, there are fewer non-relative caregivers applying for foster care licensure.

LITERATURE REVIEW

HISTORICAL OVERVIEW-CHILD MALTREATMENT

The account of relative caregivers is a tradition

found in medieval European areas (Hegar & Scannapieco, 1995). Relative caregivers likely preceded any laws or organizations that were established to regulate or oversee the help they presented to kin. Throughout history, families have been the first to assist relatives in times of need; therefore, when circumstances arose (death of a parent, economic difficulties, or inability to parent), relatives were naturally willing to aid kin. The difference between then and the documented history of such practice, has been public knowledge of the aforementioned practice. The English poor laws were the foundation of child welfare in the United States. The Elizabethan Poor Law of 1601 required public responsibility of the poor. As well, *parens patrie*—ruler's power to protect minors, was justification for the American government to intervene into parent-child relationships in an attempt to enforce parental responsibility or to supply alternative care (Briere, Berliner, et al., 1996).

However, in 1962 after publication of the "Battered Child Syndrome," Dr. C. Henry Kempe explained suspected or previously unreported injuries to children, thus, acknowledging child maltreatment as a serious concern. The reports of child abuse increased dramatically, accordingly the number of abused and neglected children placed in foster homes escalated (Tomison, 2001). Nevertheless, the government did not respond until enactment of the Child Abuse Prevention and Treatment Act (CAPTA) of 1974 (Public Law 93-247) which provided federal funding to states to prevent, identify, and treat child abuse and neglect. CAPTA was amended in 2003 with the Keeping Children and Families Safe Act. An historical overview of child welfare policy is necessary to understand the development and evolution of policy effecting foster care, foster caregivers, and supportive procedures for caregivers.

HISTORICAL OVERVIEW-FOSTER CARE

A typical solution for dependent children either orphaned or removed from their parents was apprenticeship or indenture, and it took another century before the United States discarded Poor Laws in favor of institutions; orphanages for children, which proliferated in America through the end of World War II (Hegar & Scannapieco, 1999).

In 1853, the Children's Aid Society (CAS) was founded in New York by the Reverend Charles Loring Brace; this was the first organization to embrace family care, or placing out of needy children. Brace

subscribed to the belief that rural life was inherently superior to urban living; therefore, boys and girls would be better off in homes of good Christian farmers than on the streets or in institutions (Trattner, 1999; Hegar & Scannapieco, 1999; Gleeson & Hairston, 1999). Under direction by Brace, the CAS began moving children by train (the "Orphan Trains") to the West to be placed or adopted by rural farmers. The practice was met with opposition from the children's biological parents for placing the children so far away and culminated by controversy with the Catholic Church claiming the CAS was a Protestant device used to assimilate Catholic children. Whatever the shortcomings, Brace was a prominent figure in the history of child welfare, specifically foster care.

As awareness of poor children and orphans on the streets in urban areas, the White House Conference on the Care of Dependent Children convened in 1909 to focus on children's issues (i.e., the effects of institutionalization of neglected children)[CWLA, n.d.]. Often cited as a turning point in the child welfare movement by establishing the foster care program, a central debate at the conference was over the issue of whether homes should be broken up because of poverty or not. Studies found, "the resulting consensus and recommendations of the conference were the first of their kind to formally declare a difference between a family's economic condition and their right—or ability—to raise children" (Frame, 1999). The members of the conference focused on the importance of the family, proposed the formation of the Federal Children's Bureau, and proposed the establishment of the Foster Care Program (Child Welfare League of America [CWLA], 1994).

In 1935, with the enactment of the Social Security Act arrived the separate definition of child welfare and child protection and the significance of providing services and financial assistance (U.S. Department of Health and Human Services [U.S. Dept. of HHS], Administration for Children and Families [ACF], Administration on Children, Youth and Families [ACYF], & Children's Bureau, 2000). An amendment to the Social Security Act in 1950 was the first major Federal policy affecting kin; child-only payments were made available for children, because some relative caregivers were not legally required to support a child (Jantz, Geen, Bess, Andrews & Russell, 2002).

There have been numerous modifications to child welfare policy influencing foster care since the first White House Conference. However, two that were

significant to foster care came with the Indian Child Welfare Act (ICWA) of 1979 and the Adoption Assistance and Child Welfare Act (AACWA) of 1980, Public Laws 95-608 and 96-272, respectively. With ICWA, the specification that preference would be given first to placement with extended family, then to Native American foster homes, preserving Native American families; and although AACWA did not specifically state placement with relatives as a preferred option, the phrase 'least restrictive environment' has been interpreted by some to indicate preference to kinship placement (McFadden; U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau, 2000). In addition, AACWA encouraged permanency planning to "end the drift of children in foster care." The hope was that AACWA and more comprehensive services for families in need would result in fewer children in need of care (Rosenfeld, Pilowsky et al., 1997).

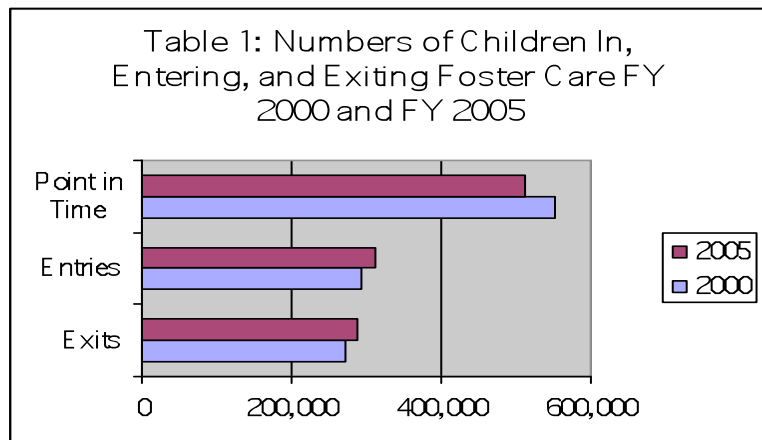
As indicated previously, numerous policies effecting children have been established from the first White House Conference on the Care of Dependent Children, the most prolific to the welfare of children being that of CAPTA, AACWA, and the Adoption and Safe Families Act (ASFA) of 1997 (Public Law 105-89). The enactment of ASFA was a culmination of reforms to child welfare policy over two decades. The philosophy of ASFA emphasized the importance of safety as paramount in decisions regarding service, time frames with placement, and permanency planning for children, as well as clarifying reasonable efforts related to family reunification and as a viable option, and promotes timely adoption of the children who safely cannot return home (U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau). In addition, ASFA required the secretary of HHS to create an advisory panel to study kinship care and report the findings to Congress and contained the "kinship exception" indicating termination of parental rights' time limits do not pertain to children in kinship care (Schwartz, 2002). The historical overview of child welfare, as well as a glimpse of the most recent statistical data available is necessary to understanding the progression of foster care and the focus of this research.

PREVALENCE OF MALTREATMENT AND CHILDREN IN FOSTER CARE

An annual report on child welfare data is based on state submissions to the National Child Abuse and

Neglect Data System (NCANDS). Child Protective Service Agencies (CPS) assign findings to a report after circumstances are investigated and a determination is made as to whether maltreatment occurred or the child is at risk of maltreatment. The standards set by Federal law are the basis for State regulations, although each state has its own definitions of child abuse and neglect (U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau, 2006). The children who State child welfare agencies are responsible for placement, care or supervision, and those adopted are reported to the Adoption and Foster Care Analysis and Reporting System (AFCARS) (U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau, 2008). Together the NCANDS and the AFCARS reports allows for pervasive collection of statistical data from child welfare, adoption, and foster care programs; in addition the data further enables the research in areas that effect children of the United States.

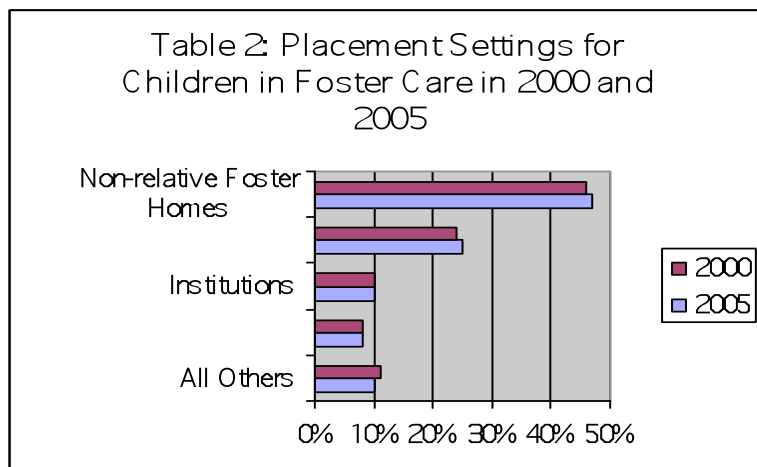
The most recent data, fiscal year (FY) 2006, the national figures were, "an estimated 905,000 children who were victims of maltreatment; the rate of victimization was 12.1 per 1,000 children in the population; and nearly 3.6 million children received a CPS investigation or assessment (U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau, 2006). The reported numbers of children in foster care were 510,000 with a mean of 28.3 months and median of 15.5 months duration, and children who exited foster care in 2006 was 289,000 of which 49 percent were reunified [see Table 1].



Note: From "Foster Care Statistics," by Child Welfare Information Gateway, 2007, Numbers and Trends, 6, p.3. Copyright 2005 by U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau. Reprinted with permission.

The national statistics of placement for children in

foster care are; 24 percent in relative foster homes, 48 percent in non-relative foster homes, 10 percent institutions, 7 percent group homes, and the remaining a mix of trial visits, runaways, or supervised independent living arrangements (U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau, 2008) [see Table 2].



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Similarly, the most recent data for Nevada reflect, "an estimated 4,756 children were victims of maltreatment and nearly 30,475 children received an investigation or assessment by the Department of Family Services (U.S. Dept. of HHS, ACF, ACYF, & Children's Bureau, 2006). The state of Nevada reported 3,599 children in foster care, their average length exceeds the national median, with the average length of stay of 34.2 months; and the number of exits was 3,378 of which 77.2 percent were reunified. Placement data for the state of Nevada afforded only the number of relative foster homes, which were 582 at the time. Based on the data only 16 percent of the child placements are with relative caregivers compared to the national average of 24 percent. These findings substantiate the need for additional relative caregivers in the state of Nevada, and thus the need for KL services of support; moreover, for KL that facilitate the retention of kinship caregivers and ensure the placements of children are protected (Center for Law and Social Policy, 2006).

CHILD PROTECTION SPECIFIC PLACEMENTS

Foster Care

Although, relative caregivers are an essential com-

ponent in the foster care system, in the past, relative placement was not the preferred choice. There are currently more than half a million children nationwide who live "somewhere else" (The Pew Commission on Children in Foster Care, 2004). These children were placed in foster care by CPS deemed not safe living with their families. Placement in foster care was for protection and safety of children, as well intended as a short-term sanctuary until children could return to their families or be adopted (The Pew Commission on Children in Foster Care, 2003).

As reported by the Pew Commission on Children in Foster Care (2003):

"Almost half of these children spend at least two years in foster care, waiting for the safe, permanent family that should be their birthright. Almost 20 percent wait five or more years. In FY 2001, nearly 39,000 infants under the age of one entered foster care [and] are more likely

than other children to face emotional, behavioral, and academic challenges."

Due to the challenges effecting children in foster care, a closer look at recruiting kinship caregivers became a necessity for many states' child welfare departments.

Kinship foster care

General definitions of relative foster care include, "Kinship foster care may be defined as the full-time nurturing and protection of children who must be separated from their parents by relatives, members of their tribes or clans, godparents, stepparents, or other adults who have a kinship bond with a child (CWLA, 1994; Geen, 2004; Hegar & Scannapieco, 1995).

The number of foster children living with kin has increased exponentially over the last two decades. In 1999, approximately 2 – 3 million children lived with relatives without a parent present in the home (Geen). Today one-third or approximately 33 percent of all children in state custody are placed with kin. This development indicates that, "states' use or kin as foster parents has expanded faster than the ability to develop a more positive attitude toward the rise of kin as foster parents" (Urbel, Bess, & Geen, 2002).

The factors contributing to the rapid growth and the increased dependency on relative caregivers reflect changes in the availability and demand for traditional foster care, financial incentives, and child welfare agencies. The availability of foster homes may be a consequence of growth in single-parent households, women currently employed outside the home, a rise in divorce rates or costs associated with child rearing (Berrick, 1998; Geen, 2004).

Additional factors attributed to the rise in kinship foster care was the increase of children that needed to be placed in out-of-home care and another element that contributed to changes in placement with relatives was the introduction of payments for kinship caregivers. In 1979, the United State Supreme Court ruled in *Miller v. Youakim*, that kin would be eligible to receive payments under conditions similar to non-kin foster parents. The policies in various states are based on that state's interpretation of the ruling: in some, kin receive the payments only if they qualify for the same licensing requirements as non-kin foster parents, and in other states more lenient approval criterion has evolved (Berrick; Hegar & Scannapieco; Ehrle, Geen & Main, 2003).

Lastly, with the expansion of kinship foster care, child welfare workers have learned to contend with the family dynamics between the caregivers and biological parents, new strategies for service follow family preservation principles, and expanded their philosophy of a permanent home to include long-term foster care with kin (Berrick).

LACK OF SUPPORT

As evidenced by research, children in kinship foster care face substantial adversity, even greater than children placed with non-relatives. Research concluded that, "Children in court-involved kinship foster care are more than twice as likely as children living with non-kin foster parents to live in families with income below 200 percent of the federal poverty thresholds (50.2 percent versus 23.8 percent, also more than twice as likely to live with a single caregiver (55.1 percent versus 27.3 percent)" (Macomber, Geen & Main; CWLA, 1994). Additionally, research literature indicates a correlation between poverty and child maltreatment. The correlation is particularly powerful for cases of neglect suggesting that families who neglect are amidst the poorest of the poor.

METHODOLOGY (PILOT STUDY)

DESIGN

The focus of this research project was the issue of assessing the impact of the KL support structure on relative caregivers, as well as procuring the reactions of both the kinship caregivers and KL assigned for their support. In addition, the project is to assess the usefulness of the kinship support structure and the ability to aide relative caregivers. The purpose of the research was to evaluate the effect of abatement on stress and strain through exploration of the strain theory on the relative caregivers by support received by KL.

The strain theory supports that child maltreatment rates are higher in lower-income families, unemployed families, and those on state aid. The main concept of the strain theory is that when a person's goals for financial gain are blocked, they experience strain, which can lead to deviant behavior. The unequal distribution of opportunities, along with the inevitable stressors associated with poverty (e.g., financial worries, ill health, crowded living conditions), produces high levels of frustration in lower-income families. When the stress becomes overwhelming, aggression may be directed at convenient, innocent victims (children). By supporting relative caregivers through mentorship by the KL, the child welfare system is proactively assisting in the relief of stressors they experience, as well as protecting and creating safe environments for the children in their care.

RESEARCH OBJECTIVE

The purpose of the research was to evaluate relative caregivers on two areas of interest: (1) to ascertain the experiences they have met in the role of as a caregiver; and (2) to establish the degree the services and supports they receive as caregivers are perceived as helpful. The primary aim of the Caring Communities Demonstration Project is to "build a home and community-based system of care to improve the safety, permanency, and well-being of children living with relative caregivers (Denby-Brinson).

As a means of evaluation for the project the research was designed to gather data, specifically, knowledge impact evaluation and peer-to-peer linkage and support. The collaboration between DFS, UNLV, system partners, and other stakeholder groups began in October of 2003, at the grant's inception (Denby-Brinson).

SAMPLE AND INSTRUMENTATION

The process began with selection of 21 relative caregivers (dependent variable), who were selected for participation in the pilot. The participants were then administered three tools; the Kinship Foster Care Training Socio-Demographic Information Form; the Relative Caregiver Self-Assessment; and the Peer-to-Peer Measure: Kinship Liaison Version (Denby-Brinson).

Three kinship liaisons (independent variable) participated in the pilot. The KL was administered one tool the Peer-to-Peer Measure: Caregiver Version. During the pilot, the evaluation protocol was tested in its entirety, including the consenting process, data collection and analysis of the reliability and validity of the peer-to-peer measurement tool (Denby-Brinson).

RELIABILITY

The Cronbach Alphas for the five scales ranged from .68 to .96, suggesting a strong correlation of perceived support from the KL rather than by chance. The results of this pilot study allowed for implementation of the full research project, although generalizing the small population to all relative caregivers of Clark County may not be feasible. Therefore, the full project was implemented in April of 2008 and findings are expected in October of 2008 (Denby-Brinson).

The Relative Caregiver Self-Assessment tool's internal consistency was computed on the safety, permanency, and well-being subscales. The Cronbach's alphas are: safety = .79; permanency = .68 and well-being = .91. The Peer-to-Peer Measure: Caregiver Version results Cronbach alpha: = .96. The method of administration of the Relative Caregivers Self-Assessment and the Peer-to-Peer Measure: Caregiver Version was by phone sur-

veys conducted by UNLV research assistants. The surveys were administered in two cycles: once at baseline (after 30 days of engagement with caregiver) and then repeated 120 days after the caregiver's involvement with a KL (Denby-Brinson).

The results of the Peer-to-Peer Measure: Kinship Liaison Version results Cronbach alpha: = .85. The method of administration of the Peer-to-Peer Measure: Kinship Liaison Version was completed by the KL after 30 days of contact with the caregiver, and then faxed to UNLV's research department for entry into the SPSS data file (Denby-Brinson).

FINDINGS

DEMOGRAPHICS

All participants in the pilot were female (100%, n=18) with 33% between 40-49 years of age. Almost a quarter (22%) of the respondents was between 30-39 years of age, and 17% were between 20-29 years of age. Eleven percent (11%) of those responding was 50-59, another 11% were 60-69, and 6% were between 70-79 years of age [see Figure 1].

Figure 1

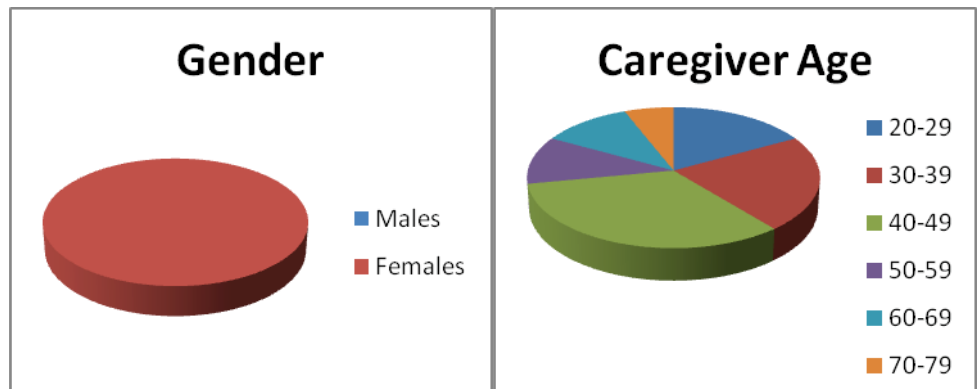
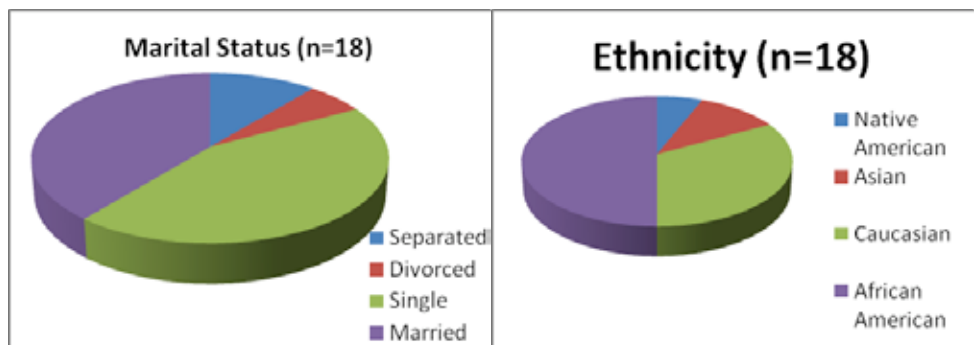
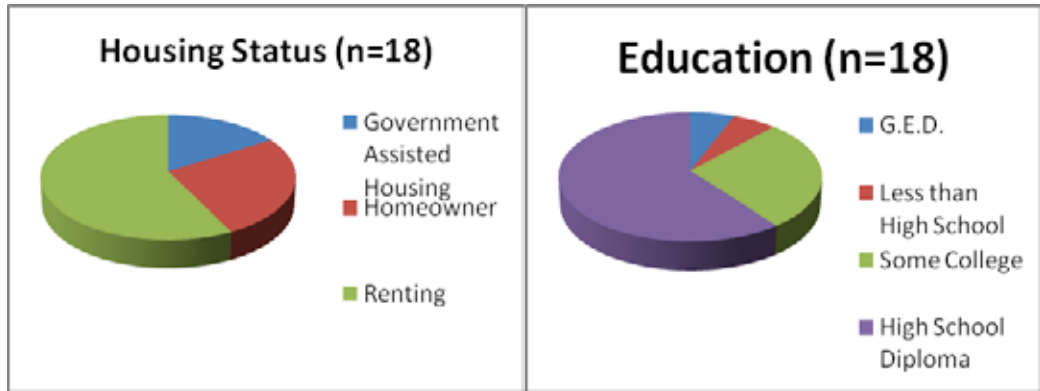


Figure 2



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Figure 3



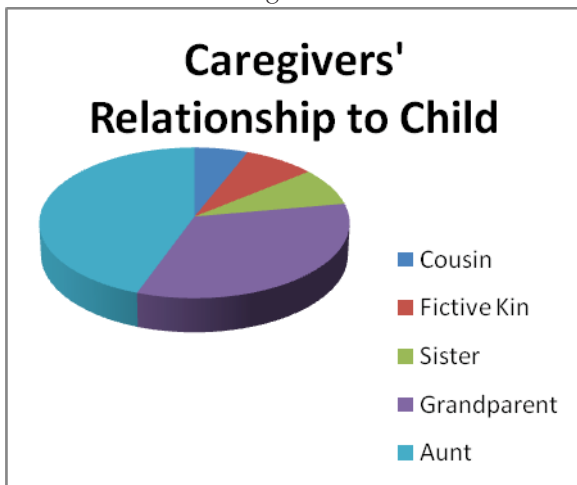
From "Caring communities demonstration project," by R.W. Denby-Brinson, 2008, June, Unpublished Manuscript, p. 22. Reprinted with permission of the author.

Less than half (44%) of the caregiver respondents were single while 39% were married. Half of the relative caregivers (50%) were African American, 33% were Caucasian, while 11% were Asian and 5% were Native American [see Figure 2] (Denby-Brinson).

A large majority (61%) of the caregivers was high school graduates and more than a quarter (28%) had some college education. Six percent (6%) had completed the G.E.D. while another 6% had less than a high school education. More than half (56%) of the respondents were renting, 28% were homeowners, and 17% were living in government assisted housing [see Figure 3] (Denby-Brinson).

Of the 18 relative caregivers providing care for relative children 44% were aunts, 33% grandparents, 8% sisters, 6% cousins, and 8% were fictive kin (not blood relation) [see Figure 4]. One hundred percent of the relative caregivers (N=18) reported they had had contact with the KL via telephone. Although, the KL and relative caregivers had other means of contact, the telephone was the most used mode of communication (Denby-Brinson).

Figure 4



From "Caring communities demonstration project," by R.W. Denby-Brinson, 2008, June, Unpublished Manuscript, p. 23. Reprinted with permission of the author.

PEER-TO-PEER LINKAGE AND SUPPORT

The Peer-to-Peer Measure has five sub-scales that assess satisfaction and peer support with a Likert scale rating; 1 = not at all to 5 = A great deal: Knowledge Sub-Scale, trust/rapport, accountability, satisfaction, and support. Overwhelmingly the relative caregivers rate the KL as knowledgeable in a variety of topics relevant to caregiving. Above all, in many categories pertaining to information, the caregivers rate the KL higher than the liaisons rate themselves (Denby-Brinson).

On the whole, relative caregivers state that trust/rapport has been established between themselves and their assigned KL. On a scale from 1-5, where "5" is a strong indication that trust/rapport exists, results exceed the 4-point marker in every category. The high mean scores in the accountability sub-scale imply the relative caregivers identify the KL as extremely accountable (Denby-Brinson).

The relative caregivers are significantly satisfied with the assistance received by the KL. Most of the items on this sub-scale the KL and the relative caregivers agree on the caregivers' high level of satisfaction. As well, the caregivers are significantly satisfied with their case worker and their KL ability to work together for their benefit (Denby-Brinson).

The pilot data show that the caregivers believe that the support from KL benefit them. As with the other sub-scales, the relative caregivers were inclined to rate the KL higher than the KL rated themselves. Moreover, the KL may underestimate the true value the relative caregivers place on them (Denby-Brinson).

IMPLICATIONS AND CONCLUSION

The findings of this particular study were important in that the results indicated the need to launch the official research project. When the official project is completed and the results replicate the pilot study, then the findings of this study, as well as the official project have important implications for policy and practice. The Clark County Department of Family Services has been under scrutiny over problems within CPS and placements (e.g., Child Haven, foster care) for children. Therefore, DFS like other agencies nationwide have seen an increase in the need and use of relative caregivers. Unlike foster caregivers, relative caregivers have difficulty locating support and access to services needed for themselves or the children in their care.

The results indicate that relative caregivers find the use of KL as a direct link to the caseworkers and community services specific to their needs. Likewise, the need for educating relative caregivers on issues effecting children in foster care were significant. Importantly, if the pilot is any indication of outcomes from the official research results, Clark County's Department of Family Services will be in possession of necessary data to continue the Kinship Liaison Program; being documented as a benefit well received by relative caregivers.

Increasingly, child welfare agencies are helping and experimenting with new approaches to engage relative caregivers. Whether children are placed in kin or non-kin foster homes, these children need a substantial amount of support. Child welfare agencies should acknowledge the uniqueness of relative caregivers and develop policies to adequately care for children entrusted to them; moreover, to take advantage of the benefits kin can offer (Geen, 2003).

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POST-TRAUMATIC STRESS DISORDER IN SOLDIERS WITH COMBAT-RELATED INJURIES

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ABSTRACT

Post-traumatic stress disorder affects many Americans who have faced a tragic event. Treatment for the disorder varies, as does its course between individuals. In recent years, physical harm or injury resulting from a traumatic event has been linked to post-traumatic stress disorder. Further, post-traumatic stress disorder has been studied in the military population. This article will explore the correlation between combat injuries and post-traumatic stress disorder and any mental health diagnosis within military populations. Limited research has been conducted on this topic. The research that has been completed suggests that there is a significant correlation between post-traumatic stress disorder and battle-related injuries.

INTRODUCTION

Approximately 7.7 million adult Americans have been diagnosed with post-traumatic stress disorder (PTSD), which is roughly 3-5% of the total population. [1] According to the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, PTSD is characterized by persistent recollections, avoidance, and hyper-arousal. [2] PTSD is an anxiety disorder that develops after a terrifying incident that involves physical harm or the threat of physical harm. Whoever develops this disorder may have been the person who was harmed, could have witnessed a harmful event, or the harm may have happened to a loved one. PTSD can occur at any age and its symptom vary between individuals. [3] People who

suffer from PTSD may startle easily due to every day occurrences like a door slamming or a car backfiring. In addition, they may become emotionally numb, have trouble feeling affection or being affectionate, be irritable, lose interest in things they used to love, or become more aggressive or violent. People with PTSD often experience flashbacks in which they repeatedly relive the traumatic event in their minds. The flashbacks may consist of sounds, images, nightmares, and/or daydreams. A person experiencing flashbacks may lose touch with reality and believe the traumatic incident is happening all over again. Symptoms usually begin within the first three months after exposure to the traumatic event. In order to be diagnosed as PTSD, symptoms must last longer than one month. The course of PTSD varies. Some individuals may recover after a few months; others may have PTSD for the rest of their lives. [1]

PTSD is treated in many ways. The most common form of treatment for PTSD is cognitive behavioral therapy (CBT). The goal of CBT is to help traumatized individuals manage and understand the anxiety and fear they are experiencing. CBT is very effective in reducing PTSD symptoms in several civilian populations, especially rape survivors. Combat survivors who have chronic PTSD benefit from CBT, but it is less effective than with this population versus civilians. In addition to CBT, relaxation therapies are used as treatment for this disorder, but are less effective with all populations than CBT. Another

type of treatment for PTSD is in vivo exposure or exposure therapy in which the individual is gradually presented with repeated confrontations of the actual traumatic stressor and with situations that evoke trauma related fears until the situation no longer produces the fear. Further, cognitive restructuring can be used as a treatment to help individuals with PTSD replace catastrophic, self-defeating thought patterns with more self-reassuring and adaptive thoughts. In addition, eye movement desensitization and reprocessing (EMDR) is a new type of therapy that requires the patient to focus on distractions like eye movements and hand tapping while talking about the trauma. Antidepressants called selective serotonin reuptake inhibitors may be prescribed to help lessen some of the symptoms of PTSD. Other types of treatments for PTSD include group and family therapy. The effectiveness of these treatments varies between individuals. If treatment is received within the first month of exposure to the traumas, the effects of PTSD may be lessened or prevented. [4, 5]

Because of the current war efforts in Iraq and Afghanistan, understanding PTSD and its correlation with battle injuries, is very important. Further, the wars in Iraq and Afghanistan are the first sustained ground combat undertaken by the United States since the Vietnam War. Since the Vietnam War, psychologists have learned more about PTSD and its signs and symptoms; however, little is known about PTSD in relation to battle injuries in the military population.

In recent years, PTSD has been compared with physical harm or injury. Since there is limited research on the relationship between PTSD and physical injury in relation to combat, the purpose of my study will be to determine the correlation between PTSD and injuries related to combat within military populations. I plan to look at a large number of soldiers and Marines who have direct combat experience in either Afghanistan, Iraq or both. Within this population, I plan to have three distinct groups; those who have injuries not related to combat, those with injuries related to combat, and those without injuries. Each group will be followed for a period of at least 12 months and compared to determine the prevalence of PTSD. Further, injury severity will be taken into account and classified as severe, serious, moderate, or minor. The data collected for this study will be self-reported by the participants, and the doctor who provides treatment for the

injury will determine injury severity.

In section II, *Mental Health Sequelae of Battle and Non-Battle Injury Among Operation Iraqi Freedom Veterans*, there were 1,968 male participants; 831 had battle related injuries and 1,137 had non-battle related injuries. These men were injured between September 2004 and February 2005. Participants were classified as non-battle or battle injury and followed through November 2006 for any mental health diagnosis. For minor and moderate-severe battle injuries, self reported mental health diagnoses were significantly higher when compared to non-battle injuries.

In section III, *Injury Specific Predictors of Post-Traumatic Stress Disorder Among Battle Injured Operation Iraqi Freedom Veterans*, the participants were 831 men who were injured in combat between September 2004 and February 2005. These participants were followed through November 2006 for a PTSD or any mental health diagnosis. During the follow-up period, 17% of the participants received a PTSD diagnosis and 31% received any mental health diagnosis. It was found that those with moderate, serious and severe injuries were more likely to be diagnosed with a mental disorder when compared to those with minor injuries. Similar results were found with a PTSD diagnosis for serious and severe injuries. Individuals with gun shot wounds were more likely to have any mental health diagnosis, but not PTSD.

LITERATURE REVIEW

War neuroses have been around since the 19th century. These war neuroses have been both acute and persistent in nature. Combat stress reactions (CSR) are a type of acute war neuroses. CSR have been called battle fatigue and shellshock in the past. The United States Army Center for Health Promotion and Preventive Medicine identifies that inability to sleep, extreme restlessness, increased startle response, apathy, poor hygiene, and reckless actions are warning signs for CSR. [7] 24% of World War II, Korean War and Vietnam War veterans hospitalized in Veterans Administration (VA) Medical Centers displayed PTSD symptoms. [8]

Before research was conducted on the prevalence of mental disorders in individuals with injuries, it was thought that people with injuries were less likely to be diagnosed with psychological disorders because they would receive more attention from others due to their injuries. In addition, it was believed that people with wounds had an escape from stressful

situations in combat conditions because the anxiety of battle was taken away. [9] Therefore, it was thought that injuries alleviated psychological casualties during war. Now, we know that this is not the case. In fact, we know the opposite to be true.

In recent years, many studies have been conducted to confirm the correlation between injury and psychological disorders. In addition, research has shown that exposure to combat and deployment stressors increase the risk of mental health problems, including major depression, PTSD, and substance abuse. [10] Hoge et. al. (2002), conducted before the war efforts in Afghanistan and Iraq began, found that six percent of all United States military service members on active duty receive treatment for at least one mental disorder each year. [11]

Hoge et. al. (2007) showed that there was a difference in willingness to report mental health problems between soldiers and Marines who returned from Iraq than those who returned from Afghanistan, members of the latter were less likely to report mental illness. [10] This same study found that "there was a strong reported relation between combat experience, such as being shot at, handling dead bodies, knowing someone who was killed, or killing enemy combatants, and the prevalence of PTSD" for all soldiers and Marines responding after deployment. [10] For example, among individuals "who had been deployed to Iraq, the prevalence of PTSD increased in a linear manner with the number of firefights during deployment." [10]

MacGregor (2007) found that there was a greater risk of mental health problems when battle injury and non-battle injury were compared; the largest effect was seen with increasing battle injury severity. [6] Further, it found that injury severity was associated with the branch of service the individual served. People who served in the Army suffered from the more severe injuries. Individuals who had severe injuries had higher heart rates and lower blood pressures than did individuals with minor and moderate injuries. [6] Individuals who experience traumatic injuries are eight times more likely to develop PTSD than those who experience an injury-free trauma. [12] Mayou and Bryant (2001) found that injury severity predicted self-report of physical recovery three months after the injury. [13]

Currently, PTSD and mental health issues with respect to war veterans is a hot topic. So much so, that the Congress has passed The Justin Bailey Substance Use Disorders Prevention and Treatment Act of 2008 (The Justin Bailey Act). This bill is designed to help improve and expand mental health services through the Veterans Administration (VA), including more treatment programs for substance use disorders. The bill requires that the VA ensure its medical centers provide ready access to care for substance use disorders for veterans in need of care. The Justin Bailey Act also requires a comprehensive review and report from each facility. This report includes: a description of the availability of care in residential mental health care facilities in each Veterans Integrated Service Network (VISN); evaluation of the of staff members to patients ratio at each residential mental health care facility; an assessment of the support provided and supervision in the residential mental health care facilities of the Veterans Health Administration and the appropriateness of rules and procedures for the prescription and administration of medications to patients; a description of the protocols at each residential mental health care facility for handling missed appointments; and any recommendations the Secretary of State deems appropriate for improvements to these residential mental health care facilities and the care provided in these facilities. [14]

Further, "In May 2001, two war-related illness and injury study centers (WRIISCs) were established to provide for the needs of veterans with deployment-related health concerns and medically unexplained symptoms." [15] These centers were opened to "provide service to combat veterans and their health care providers through 1) clinical consultation, 2) education, 3) research and 4) risk communication addressing potential environmental exposures and adverse health outcomes." [15] The first element, clinical consultation, is designed to help veterans who have medical conditions that are related to their military deployment and service related injuries. The education element of WRIISC has two primary audiences, the health care providers and the combat veterans. The primary goal of this element is to increase the comfort level and knowledge of deployment physical and mental health issues. The third element, research, allows the centers to research unexplained medical conditions and deployment-related health problems. The final element of WRIISC, risk communications, is the

“exchange of information between interested parties concerning” the magnitude, significance, nature, and control of risk. [15] Its purpose is to address the high degree of uncertainty associated with deployment-related health issues and the potential mistrust in the communication process.

CONCLUSION

PTSD affects many Americans, which includes a number of war veterans. The exact percentage of veterans affected is unknown because many cases go unreported. Treatment and its effectiveness for PTSD varies between individuals. A significant correlation exists between battle injuries and PTSD and other mental health diagnoses in the military population. Currently, there are not enough resources for war veterans diagnosed with PTSD; additional resources need to be developed due to the significant number of PTSD diagnoses. Further, more studies need to be conducted in the future on PTSD and battle injuries within military populations due to the current war efforts in Afghanistan and Iraq and the large number of war veterans diagnosed with PTSD. Recently, efforts have been made in order to assist war veterans diagnosed with PTSD and to educate caretakers about PTSD, but more needs to be done to ensure the adverse affects of PTSD are lessened or prevented to protect the brave men and women protecting the United States every day.

FUTURE STUDY

The future study that I will conduct is most closely related to a study conducted by Andrew James MacGregor at the University of California, San Diego and San Diego State University in 2007. This study used a retrospective research design to determine the relationship between PTSD and battle-related injuries and injury severity. In this study, MacGregor examined different aspects of the relationship between PTSD and combat injuries. The purposes of sections II and III of his research are the most similar to the study I plan to conduct: *Mental Health Sequelae of Battle and Non-Battle Injury Among Operation Iraqi Freedom Veterans and Injury Specific Predictors of Post-Traumatic Stress Disorder Among Battle Injured Operation Iraqi Freedom Veterans*. The conclusions of these two sections are as follows: “compared to non-battle injuries, battle injuries had a greater risk of PTSD and other mental health diagnosis, with the greatest effect seen as severity of battle injuries increased” and “injury severity was a significant predictor of any mental health diagnosis and PTSD diagnosis.” [6]

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EMOTIONAL MEMORY AND OLDER ADULTS

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ABSTRACT

There is ample evidence that normal aging is associated with a number of changes in cognitive function and brain physiology. However, changes in the processing of emotions have not been extensively investigated despite the fact that neural circuits involved in the processing of emotion are affected by the aging process. The current study addresses this issue by examining differences between younger and older adults in learning and memory of emotional words representing happiness, sadness, anger, and anxiety. Participants will include 30 older adults above the age of 65, and 30 younger adults ages 18 to 25. To assess learning and memory for non-emotional and emotional information, the California Verbal Learning Test-II (CVLT-II) and a comparable emotional list learning task will be administered to all participants. Based on the existing literature regarding age effects on the brain and cognitive processes, it was hypothesized that the bias for learning and memory of positive emotional words (happiness) seen in younger individuals would not be present in older adults.

INTRODUCTION

In recent years there has been increasing interest in changes that occur to the brain during normal aging. The interest has been fueled by observation that while brain changes occur as a

result of disease (e.g., Alzheimer's disease), many individuals never experience these pathological conditions yet still experience profound changes in brain structure and function. For example, some studies have documented a 50% reduction in the number of neurons from the age of 20 to 80 (Devaney & Johnson, 1980). Similarly, declines in cognitive function have also been extensively documented with abilities such as learning and memory being particular susceptible to the effects of normal aging. Furthermore, these declines are associated with social functioning and psychological adjustment. Thus, because most elderly individuals will not develop brain diseases, but normal age-related changes in the brain and associated decreases in cognitive function do occur, there has been an increased emphasis on understanding these age related changes.

While many age-related changes in cognitive function have been well-documented by numerous empirical investigations, relatively little is known regarding age-associated changes in emotional processing. However, much progress has been made in the area of emotional processing in younger individuals, which, when combined with knowledge regarding age-related changes in brain structures and circuits, does provide a basis for developing hypothesis about changes in emotion processing in the elderly.

With regard to the emotion literature, basic emotions are considered by most theorists to be those emotions that are universally experienced. Most theories divide emotions into positive and negative categories, yet differ with regard to which basic emotions make up these categories (Izard, 1991). Although investigations have not resulted in a discrete number and list of positive and negative basic emotions, fear, disgust, anger, and sadness are included in most negative classifications, and happiness and surprise are included in most positive classifications. Recently, positive emotion theorists have proposed the existence of several other distinct positive emotions (e.g., joy, interest, contentment, love), which are thought to have corresponding cognitive and/or physical response patterns (Fredrickson & Branigan, 2001).

Although several theories have postulated the existence of discrete basic emotions (Ekman, 1984; Frijda, 1986; Izard, 1971; Plutchik, 1980), relatively few studies have attempted to determine whether cognitive processing differs among basic emotion categories. Comparisons of memory for positive, negative, and neutral stimuli have shown consistent support for increased memory performance for positive information in free recall and recognition measures of long-term memory (cf. Bradley, Greenwald, Hamm, 1993; Colombel, 2000; Libukman, Stabler, & Otani, 2004; Shillace & Dragon, 1971; Silverman & Cason, 1934). These findings reflect a memory bias for positive information. Matlin and Stang (1978) termed this memory bias the Pollyanna Principle, to reflect a general tendency to select pleasant information over unpleasant information, and described the phenomenon as resulting from increased accuracy and efficiency relative to the encoding and retrieval of positive information.

Based on these considerations, the goal of the current study is to examine changes in emotion processing that occur as a result of healthy aging. More specifically, since learning and memory are two areas that have been implicated in the aging process, we will examine learning and memory for emotional information to determine if, in fact, there are differences between younger and older adults in their ability to learn and recall information that is emo-

tional in nature. The research we will be conducting has the potential to significantly inform our knowledge of how age-related changes in brain function influence the memory for emotional information in older individuals. Findings from this study also have potential to provide important knowledge regarding a memory process yet to be studied in older adults (i.e., emotional memory), but possibly provide a foundation of knowledge that can be later applied to individuals with Alzheimer's Dementia, to develop new psychiatric medications designed to remediate emotional disturbances that occur in this population.

LITERATURE REVIEW

While extensive information exists regarding the effects of disease on brain physiology and function, research related to aging is one of the younger areas of investigation. Given the ongoing demographic revolution in the United States, the integration of neuropsychology and gerontology is critical. Older adults, 65 or older, commonly report difficulty with learning, memory, and other cognitive abilities compared to an earlier period. The fear in developing a condition that affects cognition such as Alzheimer's disease, Parkinson's disease, and stroke are common and understandable. Impaired cognitive function in older adults is associated with loss of independence, increased morbidity and mortality, and reduced quality of life. As a result of these factors, a considerable amount of research has been dedicated to understand age-related cognitive decline, its neural bases, and factors which may modify or delay it (Nussbaum, 1997).

Much of our time is spent engaging in the process of experiencing and expressing our own emotions in addition to trying to understand the emotional expression of others.

Traditional literature rarely addresses the research on emotion and normal aging. This area of research is important for gaining knowledge regarding age-related changes in structure, experience, and expression of emotion, which can significantly impact the correct diagnoses and treatment of aging populations (Nussbaum, 1997).

Basic emotions are considered by most theorists to be those emotions that are universally experienced. However, the number of emotions held to be "basic" varies from one theorist to another (Ortony and Turner, 1990). Some theorists classify basic emotions into only two categories, pain and pleasure (Mowrer, 1960), while other theorists propose the existence of multiple basic emotions, such as happiness, surprise, anger, fear, sadness, disgust, and contempt (Ekman, 1984). Currently, most theories divide emotions into positive and negative categories, yet differ with regard to which basic emotions make up these categories (Izard, 1991). Although investigations have not resulted in a discrete number and list of positive and negative basic emotions, fear, disgust, anger, and sadness are included in most negative classifications, and happiness and surprise are included in most positive classifications. Recently, positive emotion theorists have proposed the existence of several other distinct positive emotions (e.g., joy, interest, contentment, love), which are thought to have corresponding cognitive and/or physical response patterns (Fredrickson & Branigan, 2001).

Although several theories have postulated the existence of discrete basic emotions (Ekman, 1984; Frijda, 1986; Izard, 1971; Plutchik, 1980), relatively few studies have attempted to determine whether cognitive processing differs among basic emotion categories. This is particularly true with regard to investigations of memory and emotion, despite evidence suggesting that different brain regions are involved in the processing of discrete emotions (Panksepp, 1992). The majority of studies examining emotion and memory have subscribed to a dimensional valence-arousal theory of emotion (Bradley, Codispoti, Cuthbert, & Lang, 2001; Cacioppo & Gardner, 1999; Davidson & Irwin, 1999; Dickinson & Pearce, 1977), rather than a basic emotion model (Ekman, 1992; Izard, 1977; Lazarus, 1991; Tomkins, 1962), and subsequently compared memory for positive, negative, and neutral stimuli. Investigations subscribing to the dimensional theory of emotion have shown consistent support for increased memory performance for positive information in free recall and recognition measures of long-term memory (Amster, 1964; Barret, 1938; Bradley, Greenwald, Hamm, 1993; Bradley, Greenwald, Petry, & Lang, 1992; Colombel, 2000; Hayward & Strongman,

1987; Libukman, Stabler, & Otani, 2004; Lishman, 1972a; 1972b; Matlin, Stang, Gawron, Freedman, & Derby, 1979; Phelps, LaBar, & Spencer, 1997; Shillace & Dragon, 1971; Silverman & Cason, 1934; Rychlak & Saluri, 1973). These findings reflect a memory bias for positive information. Matlin and Stang (1978) termed this memory bias the Pollyanna Principle, to reflect a general tendency to select pleasant information over unpleasant information, and described the phenomenon as resulting from increased accuracy and efficiency relative to the encoding and retrieval of positive information. With regard to memory, the tendency to remember positive information not only occurred in studies examining experimenter generated lists, but also encompassed the recall of daily experiences and participant generated-lists (Matlin & Stang, 1978). Matlin & Stang (1978) also notes that the differential processing of positive information extended to areas of cognition such as size judgment for pleasant and unpleasant items, the likelihood of responding with a positive word in a free association task, and the likelihood of indicating that the majority of ones daily experiences are pleasant. It is unknown whether the Pollyanna Principle will be found in older adults, as it is known that regions governing emotion processing (e.g., Amygdala and Hippocampus) deteriorate with age.

LITERATURE REVIEW

Basic emotions are considered by most theorists to be those emotions that are universally experienced. Most theories divide emotions into positive and negative categories, yet differ with regard to which basic emotions make up these categories (Izard, 1991). Although investigations have not resulted in a discrete number and list of positive and negative basic emotions, fear, disgust, anger, and sadness are included in most negative classifications, and happiness and surprise are included in most positive classifications. Recently, positive emotion theorists have proposed the existence of several other distinct positive emotions (e.g., joy, interest, contentment, love), which are thought to have corresponding cognitive and/or physical response patterns (Fredrickson & Branigan, 2001).

Although several theories have postulated the existence of discrete basic emotions (Ekman, 1984; Frijda, 1986; Izard, 1971; Plutchik, 1980),

relatively few studies have attempted to determine whether cognitive processing differs among basic emotion categories. Comparisons of memory for positive, negative, and neutral stimuli have shown consistent support for increased memory performance for positive information in free recall and recognition measures of long-term memory (cf. Bradley, Greenwald, Hamm, 1993; Colombel, 2000; Libukman, Stabler, & Otani, 2004; Shillace & Dragon, 1971; Silverman & Cason, 1934). These findings reflect a memory bias for positive information. Matlin and Stang (1978) termed this memory bias the Pollyanna Principle, to reflect a general tendency to select pleasant information over unpleasant information, and described the phenomenon as resulting from increased accuracy and efficiency relative to the encoding and retrieval of positive information. It is unknown whether the Pollyanna Principle will be found in older adults, as it is known that regions governing emotion processing (e.g., Amygdala and Hippocampus) deteriorate with age. Based on the existing literature regarding age effects on the brain and cognitive processes, it was hypothesized that the bias for learning and memory of positive emotional words (happiness) seen in younger individuals would not be present in older adults.

METHODOLOGY

PARTICIPANTS

Participants will include 30 older adults (> 65 years) and 30 younger adults (ages 18-25). Older participants will be recruited from the community while younger participant will be recruited from the psychology department's subject pool. Individuals will be excluded from the study if English is not their primary language, they have a speech impediment, report a current psychiatric or neurological diagnosis, or exhibit severe psychopathology based on routine screening. Individuals will also be excluded if they have a history of psychiatric disorder or treatment, or a history of neurological disorder including traumatic brain injury. Older adults will receive a stipend of \$20 per session of participation as remuneration for their time and expenses in traveling to the UNLV campus or any inconvenience in having an experimenter come to their residence. Younger adults will be compensated with course credit. This research was approved by the local institutional review board for the

protection of human subjects and all participants will provide informed consent prior to completing any of the study procedures.

MEASURES

The following measures will be administered to all participants in the current study: 1) demographic and medical history questionnaire, 2) California Verbal Learning Test-II, 3) Emotional Verbal Learning Test, and 4) Symptom Checklist 90 Revised.

Demographic and medical history questionnaire: Prior to the administration of test procedures, all participants will provide self-report emotionality ratings regarding their present mood-state, as well as their mood state over the past 2 weeks. Self-report ratings will be coded on a 7-point scale, with 1 reflecting little current experience of emotion and 7 reflecting a great amount of emotional experience. Participants will rate their mood state for the emotions of happiness, sadness, anger, anxiety, and disgust. Mood-state ratings will be obtained to investigate the influence of mood-congruent memory.

California Verbal Learning Test-II (CVLT-II): The California Verbal Learning Test (CVLT; Delis, Kramer, Kaplan, & Ober, 1987) is a test of verbal learning and memory, which involves oral presentation of 16 words over five immediate-recall trials. Words are presented at the rate of approximately one word per second. After each trial, subjects are asked to recall as many of the words as they can remember. The list consists of 4 words from each of four categories including fruits, clothing, tools, herbs and spices. Following five presentations of the first list (List A) a second list (List B) is presented as a distracter list and subjects are requested to recall as many words as possible from this second list. Immediately thereafter, participants are requested to recall as many words as they can from list A. Cued recall trials are then completed in which the participant is asked, one category at a time, to recall as many of the words in each semantic category as they can from list A by being cued with the categories of fruit, clothing, tools, and spices (Cued recall). Following a 20-minute delay in which non-verbal tasks are performed, the participants are asked to recall as many items from list A in both a free recall and cued recall situations. Therefore, the CVLT

measures recall, recognition and list learning; interference effects and retrieval/encoding difficulties can also be evaluated with this measure. The dependent variables used in the study include the number of words recalled on each of the five trials as well as the number of words recalled on list B, upon immediate and cued recall of List A, and following the delayed and cued recall condition for List A. The words on the CVLT have been judged to be of neutral emotional content (Strauss and Allen, unpublished manuscript). The CVLT-II is an updated version of the first edition of the CVLT (Delis et al., 1987).

Emotional Verbal Learning Test (EVLTL): The Emotional Verbal Learning Test (EVLTL) (Strauss & Allen, 2005) is a measure of learning and memory for emotional words. The EVLTL is a standardized measure with psychometric properties comparable to popular tests of non-emotional memory (e.g., the CVLT-II). The EVLTL is an emotional analog to the widely used California Verbal Learning Test (CVLT-II). The EVLTL resembles the CVLT-II in format and structure; however, word lists represent discrete basic emotional categories. The task first requires the experimenter to orally present 16 words (List A) over five immediate-recall trials. The list consists of 4 words from each of four categories (Happiness, Sadness, Anger, Anxiety). Following the administration of the five trials, a second "interference list" (List B) is presented for a single trial (including 8 disgust words and 2 words from each of the 4 List A categories). Immediately following List B, a short delay free and category cued recall of List A is conducted. A 20 minute delay then occurs between the presentation of the short-delay and long-delay free recall assessments. Long delay free and cued recall is then assessed. Recognition of List A is measured using a yes-no recognition format immediately proceeding the administration of the long delayed recall. Words included in the EVLTL were taken from emotional intensity and categorization norms developed by Strauss and Allen (Unpublished manuscript). List A and B words are empirically validated to represent their intended categories. Further test development procedures and psychometric properties are detailed in Strauss and Allen (Unpublished manuscript).

The Symptom Checklist 90 Revised (SCL-90-R) (Derogatis,

1983): The SCL-90-R will be included as a means of screening for psychopathology. The SCL-90-R is composed of 90 items that assess psychopathology specific to 9 factors, as well as overall psychopathology. Overall psychopathology is measured using a global severity index score, which accounts for the contribution of psychopathology from all factors in relation to gender and education. Norms developed for male and female adult nonpsychiatric individuals will be used to assess global psychopathology in the current study.

PROCEDURE

All testing will be conducted by the primary author, and occur in a quiet setting (laboratory office) located on UNLV campus. The research battery will be individually administered to all participants in one sitting that lasts approximately 2.0 hours. The research battery includes a demographic and medical history questionnaire, the California Verbal Learning Test-II (CVLT-II; Delis et. al, 2000), the Emotional Verbal Learning Test (EVLTL), and the Symptom Checklist 90 Revised (SCL-90-R). Detailed descriptions of these procedures are provided in the Research Battery section below. The SCL-90-R is a standardized questionnaire that measures psychological symptoms. This measure is included to determine whether individuals expressing different patterns of psychological symptoms evidence greater memory bias for words related to their levels of psychological symptomatology. Order of memory task administration will be counterbalanced to control for possible carry-over effects related to test presentation and fatigue. After testing is complete, time will be allotted for participant questions, and all participants will be given a debriefing form containing experimenter contact information and information regarding the nature of the study.

DATA ANALYSIS

The current study is a between groups design (older and younger) with two dependent measures (CVLT and EVLTL). Comparisons between the older and younger groups on the various indexes of the CVLT and EVLTL will allow for a direct evaluation of the hypothesis, with the expectation that the older group will learn fewer happiness words relative to the younger group, although no other differences will be present. To test this hypothesis, given that there are multiple

dependent variables, a multivariate analysis of variance will be performed with compared the younger and older groups on the CVLT and EVLT measures. Significant differences between the groups on the EVLT and CVLT will be further evaluated using analysis of variance followed by post hoc comparisons in order to determine if overall group differences are consistent with the hypotheses.

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INFANTS' CATEGORIZATION OF FACES

BY JULIO A. LUNA



ABSTRACT

The purpose of this study is to determine if infants can categorize faces using femininity, gender or both cues and if these cues change with development. Dr. Jennifer L. Ramsey-Rennels and Judith H. Langlois' (2006) article, "Infants' Differential Processing of Female and Male Faces" is most directly related to my study.

Categorization allows society to follow unwritten rules and helps people interact accordingly. It is not surprising that it begins to emerge during infancy. However, there are possible negative outcomes; categorization of people may become linked to stereotyping. Important areas of study that may provide psychologists clues as to the origins of stereotyping are the recognition, evaluation and categorization of adult faces.

Although it is unclear when early face categorization in infants begins to develop, infants as young as 3-months have demonstrated the ability to discriminate faces using perceptual cues (Kelly et al., 2005). Early perceptual categories may become linked to traits, attributes, and behaviors that could also develop into stereotypes (Ramsey et al., 2004). Most likely, stereotyping is not learned purposely. However, it is learned one way or another. Whether its observed or learned through social interaction, stereotyping may be at the forefront of our behavior without our knowledge or consent, becoming

more automatic and engraved in our persona.

This study will contribute to the field of psychology by helping increase knowledge about the process of infant categorization. It also will help with furthering knowledge about the origins of the stereotype process. Being aware of how stereotypes develop might provide insight on how to manage it and direct it in a positive and constructive manner. Eliminating some stereotypes might make this world a better place.

INTRODUCTION

Visual stimuli are everything visible to the naked eye. They are extremely significant to the behavior of people and understanding of their social world. Face processing and categorization are cognitive processes that help people assemble social groups and categories. Cognitive processes like face processing are important in that they help humans recognize emotional expressions and carry out acceptable social interaction. Given that infants are exposed to faces at an early age, research in this area gives psychologist a chance to explore infants' early categories of faces and how these categories guide infants' processing of faces and their environment around them.

Categorization is a basic skill that helps people acquire reliable recognition of and a more efficient response to novel stimuli (Ramsey-Rennels & Langlois, 2006). It exists whenever two or more dis-

tinguishing objects or events are treated equivalently (Mervis & Rosch 1981). Infants have the ability to form a range of perceptual categories before the age of 1 year (Younger & Fearing, 1999). Such abilities can facilitate and increase the learning process about everything in the environment (Ramsey-Rennels & Langlois, 2006), especially human-to-human interaction. Without face categorization, people would not have the ability to distinguish between female and male faces. Not being able to categorize grandma and grandpa could pose a problem. As unpractical as this idea might be, it demonstrates that categorizing is extremely important and touches every part of life.

Developing early categorical representations based on perceptual attributes may serve as support for later knowledge acquisition (Quinn, 1999). The ability to categorize at an early age can help infants learn about different objects at a quicker rate (Ramsey-Rennels & Langlois, 2006). Like everything in life, the earlier a skill is acquired and the longer people have to practice it, the better and more efficient they will become.

Although it is unclear when early face categorization in infants begins to develop, infants as young as 3-months have demonstrated the ability to categorize objects using perceptual cues. In a study conducted by Quinn, Eimas, and Rosencrantz, (1993) infants were familiarized to two categories: cats and dogs. During the test phase, infants looked longer at an exemplar from a novel category, a bird, than at a novel exemplar from the familiar category. The study showed that infants can form categorical representations based on visual stimuli like pictures.

According to Younger (1992), there are attributes in nature that tend to cluster together. For example, dogs have fur, but do not have feathers or beaks and birds have both. These correlating attributes are important in categorization. In one study, infants were able to categorize cartoon animals (Younger & Cohen, 1996). The researchers used different types of cartoon animals that varied in size, shapes and anatomy. The researchers correlated two of the three attributes. For example, infants were exposed to cow-shaped body animals with feathered tails, as well as giraffe-like animals with a fluffy tails. After the infants were exposed to the animals, 10-month-olds showed increased attention to the stimulus that did not follow the norm (e.g., cow-shaped body with a feathered tail) (Younger, 1992). The researchers in the present study performed comparable methods by first,

familiarizing infants to typical faces and then pairing a typical face with an atypical face. The researchers familiarized infants to a certain category of female or male faces (e.g. high attractive, high feminine) and then paired novel faces from the familiar category with novel faces from a novel category. The infants responded in the same manner as in the Younger (1992) study. That is to say that in the current study infants were able to categorize and classify faces.

To ensure that infants are indeed categorizing objects or faces, it is necessary to demonstrate that infants can discriminate among the objects or faces within a particular category. Discrimination involves the recognition of the difference between one thing and another and should not to be mistaken with categorization, which entails placing stimuli in a particular category or classification of some sort. With regard to the processing of species information from faces, 6-month-olds are able to discriminate both human and monkey faces, whereas 9-month-olds and adults can only discriminate human faces (Pascalis, de Haan & Nelson, 2002). Infants have more experience with human than with monkey faces, so with time, they lose their ability to discriminate monkey faces.

Experience with faces, which affects discrimination and categorization abilities, may be a contributing factor in the development of stereotypes (Ramsey-Rennels and Langlois, 2006). Children are now seen as perceiving and organizing information and creating conceptual structures that help guide their behavior (Leinbach & Fagot, 1993). Early perceptual categories may become linked to traits, attributes, and behaviors that could also develop into stereotypes (Ramsey et al., 2004). Most likely, stereotyping is not learned purposely. However, it is learned in one way or another. Whether its observed or learned through social interaction, stereotyping may be at the forefront of our behavior without our knowledge or consent, becoming more automatic and engraved in our persona.

A few studies in the literature indicated some fruitful and positive findings that may help researchers understand the origins of social categorization in humans. In one study, researchers examined 6-month-olds' categorization of attractive or unattractive faces (Ramsey et al., 2004). One group of infants was familiarized to unattractive female faces and another group was familiarized to attractive female faces. Then the experimenters tested infants' interest in novel faces from familiar category paired with the novel faces from the novel

attractiveness category. Infant interest in the novel attractiveness category for both groups showed that the infants could categorize the faces based on their level of attractiveness (Ramsey et al., 2004).

The infant spends 50% of their first year with their primary caregiver (Ramsey-Rennels & Langlois, 2006). During the first year of life, 71% of infants' social exchanges are with females (Rennels & Davis, 2008), possibly contributing to the preference of female faces over the male faces. Conversely, infants raised by a male primary caregiver demonstrate preference toward male faces over female faces (Quinn, Yahr, Kuhn, Slater & Pascalis, 2002).

The purpose of this study is to examine if infants categorize faces using femininity, gender, or both cues and if their categorization abilities change with development. We are interested in whether 6, 9, and 12 month-olds have a similar categorization process or if it differs during development. To study these aspects of categorization, there were four familiarization conditions used in this study: high attractive/high feminine female, low attractive/low feminine female, high attractive/high feminine male, low attractive/high feminine male. Like other categorization studies, infants were then tested with pairs of novel faces, one from the familiar category and one from a novel category. To determine if infants had an initial preference for any of the test faces within these pairs, they were shown the test face pairs at the start of the study. They were then familiarized to a particular category of faces (e.g., high attractive, high feminine females) and tested on their interest in new categories of faces that differed in femininity, gender, and both cues.

This procedure allowed us to assess whether infants' initial visual preferences for the test faces changed at test following the familiarization phase. Because infants are more familiar with female than male faces, the high feminine faces should seem more familiar and be easier to categorize than low feminine faces. We are also expecting that the infants will rely more on femininity than gender cues to categorize the faces.

METHODOLOGY

PARTICIPANTS

Infants aged 6 (n = 36, 18 male, 18 female), 9 (n = 30, 14 male, 16 female), and 12 (n = 38, 18 male, 20 female) months participated in this study. Infants were eligible to participate two weeks before or after their 6, 9, or 12 month birthday. Researchers reviewed local newspapers for current birth announcements and located parents using public online records. Researchers mailed letters and made follow-up calls

to the parents of eligible infants to schedule infants for the study.

Infants who participated were comprised from the following ethnicities: 2% Puerto Rican, 1% Spanish/Hispanic/Latino, 9% Mexican/Mexican-American/Chicano, 1% Cuban, 4% Multi-ethnic or other Hispanic, and 8% did not report ethnicity. Infants' race consisted of: 79% Caucasian, 1% African American, 1% Chinese, 14% Multi-racial or Other Race, and 4.8% did not report race. The data from 32 infants were deleted for the following a priori reasons: extremely fussy (n = 19); parent interaction (n = 4); off-task (n = 1); infant born more than 21 days prior to original due date (n = 7); developmental delay (n = 1). The parents were compensated with a t-shirt or bib for the infant's participation.

STIMULUS FACES

There were a total of 38 (19 male/19 female) digitized, color photographs of faces, with the people ranging between 18-25 years of age. The stimulus faces were posed with neutral facial expressions, free of any makeup, piercing, and facial hair; photos were cropped from the neck up with a white sheet masking any clothing cues. All faces were equalized for brightness and contrast and had the same background. Two separate groups of undergraduates (N = 40) with roughly equal numbers of males and females) rated the faces for attractiveness or femininity. Ratings were highly reliable. Once rated, the faces were divided into four conditions: high attractive/high feminine females (HHF), high attractive/high feminine males (HHM), low attractive/low feminine females (LLF), and low attractive/high feminine males (LHM).

APPARATUS

The parent and infant sat in the study room and the experimenter sat in the control room. The study room contained two 38.1cm monitors built into the occluder, a black wooden structure, facing the infant, which displayed the stimuli. The purpose of the occluder was to block any other items that might distract the infant. The monitors were 23.5cm apart from each other and 132cm away from the infant. A VHS video camera recorded the stimuli displayed on the computer monitors to ensure the proper stimuli were shown. There was a digital camera 20.5cm below the space separating the stimuli monitors that recorded infant looking. The experimenter communicated with the parents through an intercom connected from the study to the control-room. In the control room, there was a 38.1cm apple monitor and computer connected to the two monitors in the study room, which the experimenter used to run the study along with the Habit X 1.0

software. Research assistants used Supercoder to record where and how long infants looked during the study.

PROCEDURE

A researcher explained the study to the parent and obtained voluntary demographic information and informed consent. In the study room, the parents positioned the infants on their lap facing the monitors. The parent wore opaque sunglasses and they were asked not to interact with the infant to avoid influencing where and how long infants looked at the faces.

To start the study, and in between each trial, there was a growing and shrinking ball with a whistle that served as an attention getter. The study had three main parts: a spontaneous visual preference portion, familiarization portion, and test portion. The visual preference phase, which was designed to establish any initial preferences the infant might have for the faces, consisted of three pairs of faces that differed in gender only, femininity only, or femininity and gender. Face pairs were shown twice in randomized blocks with a left-right reversal during the second showing for a total of six trials. During the familiarization phase, the infants were familiarized to faces from one of the four familiarization conditions. They saw four faces shown three times each for a total of 12 trials. During the test phase, infants saw the same three pairs of faces as shown during the visual preference phase to measure if there was any change from initial preference to the test phase and to see if the infants were influenced by the familiarization phase. On the final trial, the infants were shown a colorful butterfly to test their fatigue. All of the trials lasted 15 seconds.

After the study, three research assistants coded the video for the duration and direction the baby looked. The average of the three raters was used for analysis. The criterion was .85 or higher interrater agreement. Our a priori standard was that if dropping a person's data increased reliability by .05 or more then that person's data were dropped from the analyses.

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THE EFFECT OF PATENTS ON INNOVATION AND ACCESS TO PHARMACEUTICALS

BY CHARLES MAO



ABSTRACT

This paper considers the role of intellectual property rights and its effect on innovation and access to pharmaceutical drugs. The significance of intellectual property rights is especially high for pharmaceutical companies since these firms spend the majority of their initial capital and subsequent revenues on research and development of new drugs. However, there are numerous problems and controversial policies in the access, pricing, and development of drugs in third-world countries. One controversial policy is the use of compulsory licensing and its effect on intellectual property rights and begs the questions: Are the effects of compulsory licensing detrimental or beneficial to the pharmaceutical companies as well as for the consumers and what kind of effects does compulsory licensing have on continued incentives for innovation? This research paper will seek to answer these questions and discuss the evolution of these policies as well as the effects that it has on pharmaceutical companies and their consumers. The final section of the paper focuses on some possible solutions and variables that need to be considered in order to benefit all respective parties.

INTRODUCTION

The innovation of drugs throughout the last few decades has been significant and empirical evidence shows that it has improved the quality of life for many people around the world. The continued development of new HIV/AIDS drugs has not only

helped people who are infected with the disease to continue living, but have also provided them with a higher quality of life. Furthermore, other types of recent drugs developed have helped the treatment of diabetes, cholesterol problems, coronary problems, and many others. However, in order to continue to spend billions of dollars in the research and development of new drugs, patents of these drugs need to be protected in order for pharmaceutical companies to recoup their costs.

Economic principles suggest that firms enter into a market and operate since there is an economic incentive for them to do so. Without intellectual property rights, there will be little or no incentives for these firms to continue to innovate. Under the specification of the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), patents for products which include pharmaceuticals are protected for 20 years. However, countries are given the power to approve compulsory licensing in certain circumstances. Some countries have taken the liberty to allow compulsory licensing of generic drugs and have loosely interpreted the provisions of the agreement. These acts have undermined the profits of pharmaceutical companies as well as their ability to recover their expenses.

Through research and with the support of applied economic principles, this paper explains the importance of pharmaceutical patents and that the pro-

tection of these patents is essential to the pharmaceutical industry's incentive to continue to innovate. Even though some consumers will be paying a higher price than they would be with compulsory licensing, continued innovation will benefit consumers for these drugs in the long run by ensuring more and better drugs. The following sections include: the importance of patents and its effects on pharmaceutical innovation; the monopoly power that is granted to pharmaceutical companies through patents and the need for regulation; the effects of generic drug competition on pharmaceutical companies and consumers; the effects of compulsory licensing on pharmaceutical companies and for the countries in need; the disparity between middle-income and poor income countries; AIDS and continued need to innovate for new AIDS drugs. Finally, the conclusion will consider some possible solutions and variables that might steer the current problems in the right direction.

LITERATURE REVIEW

I. IMPORTANCE OF PATENTS AND ITS EFFECTS ON PHARMACEUTICAL INNOVATION

The importance of patents is critically important to pharmaceutical innovation because the major expenditure in creating a pharmaceutical drug is in the research and development. One recent example is the drug Torcetrapib which was being developed by pharmaceutical company Pfizer to treat hypercholesterolemia (elevated cholesterol levels) and prevent cholesterol disease. Pfizer reportedly spent 90 million dollars to build a plant in Ireland that had already started production of the drug. More importantly, the company spent \$800 million dollars in clinical trials which involved around 25,000 patients. This was the most expensive clinical trial ever conducted by Pfizer and the drug never was successfully developed and was stopped in 2006 for excessive mortality in its clinical trials. These clinical trials are paid and conducted by large pharmaceutical companies like Pfizer because of patent protection. Pharmaceutical companies are willing to take these billion dollar risks in the development of new drugs because they are counting on a large pay-off if the drug becomes successful not to mention that these drugs will also eventually help treat millions of people. Furthermore, gaining regulatory approval for a drug also takes considerable time and money. Due to high initial costs of developing a drug and low variable costs of making the drug after it has been approved, reliable patent protection is essential in order for companies to continue to take risks on

innovation. Otherwise, imitations or generic drug companies can free ride on the R&D costs of the originator's company.

Richard Levin et al., and Wes Cohen et al., have both conducted surveys of US R&D manager to identify which factors are most important and necessary in appropriating the benefits from innovations. The survey was conducted in a large cross-section of industries and the factors included superior sales and service efforts, secrecy and complexity of production and product technology, competitive advantages of being first in the market, and patents. Both of these studies found that the pharmaceutical industry placed patents as the number one factor.

Most drugs fail to reach the market for reasons such as carcinogenicity, toxicity, manufacturing obstacles, dosing characteristics, inadequate efficacy, economic and competitive factors, etc. In the Pfizer case above, Torcetrapib never made it to the market because there were fatalities during the late clinical trial stage. It was simply a failed investment of one billion dollars. An earlier survey conducted by Taylor and Silberston found out that UK R&D managers estimated that pharmaceutical expenditures in R&D would be reduced by 64% if there was no patent protection. Compared with the pharmaceutical industry, the research also discovered that the average reduction of R&D expenditures was only 8% across all other industries. These findings bolster the importance of patent protection for the continued operation of the pharmaceutical industry.

II. MONOPOLY POWER AND THE NEED FOR REGULATION

Although pharmaceutical companies are needed to continue innovating for new drugs, there still needs to be continued strict regulation to prevent these companies from abusing the monopoly power that they are granted. Patents are essential for the continued development of drugs, but they also provide monopoly power to firms. Since pharmaceutical firms are large rent-seeking corporations, they exist for the purpose of making money. The responsibilities of a corporation are too complex to explain in this paper but it is important to note that there are many responsibilities of a firm. The main responsibility for a firm is to itself and its stockholders. It is economical for them to try to maximize their self-utility by increasing profits and decreasing consumer surplus. For example, companies try to extend the life of their existing patented drugs by making small

improvements and attempt to get that drug recognized as a new invention. If it is recognized as a new invention, it will provide that drug with many years of extended patent protection.

Although pharmaceutical firms are interested in increasing revenue and profits, they cannot be viewed in an entirely negative light. U.S. pharmaceutical company Merck, agreed to sell some AIDS drugs at no profit in response to the growing crisis in Africa. The annual at-cost price of Crixivan sold to African countries in need would be \$600 compared to the wholesale price of \$6,016 that is charged in the U.S. Merck has also created a donation program for its drug Mectizan (ivermectin) for river blindness. This project, which began in 1987, has treated more than 200 million people for this disease in 33 countries. Additionally Pfizer has been sponsoring Glaxo Smith-Kline to donate the anti-filaria drug (albendazole), which is known to treat worm infestations. Another large drug company, Novartis, has a donation program where they provide a multi-drug therapy to eliminate leprosy. All of these drug companies have committed themselves to solve these problems and continue to supply pharmaceutical drugs until these targeted diseases are eliminated. Furthermore, 90% of the drugs on the World Health Organization's (WHO) List of Essential Drugs are not patent protected. They are sold at extremely low prices. Despite the low prices, they are still not adequately distributed and used. Pharmaceutical companies cannot be entirely blamed for these actions. Governments, politics, charitable organizations, and other firms all have a responsibility to help in the distribution, usage, and funding of programs for those who are in need.

III. GENERIC DRUGS AND COMPETITION

It is common knowledge that generic drugs and generic competition among drug companies drive down price. Lower prices provide greater access and benefits to the consumer. In contrast to patented name-brand drugs, the development costs of generic drugs are much lower. The development costs only 1-2 million while the process only takes few years. This is due to the reason that generic compounds only need to be bio-equivalent of the original patented drug in order to gain FDA approval. New tests and clinical trials are not needed as long as the chemistry component matches. In contrast to patented drugs, the success of FDA approval is very high since the composition of the drug is

based off of the patent.

Although generic drug companies provide cheap drugs to consumers, it is important to note that these companies also exist due to economic reasons. They are not charitable institutions whose main purpose is to help people without the intention to make any profit. These drug companies exist to cut into the profits of large pharmaceutical companies. This is not necessarily an unethical business technique thing since increased competition will ultimately benefit consumers.

Compulsory Licensing has benefited the generic drug industry immensely. Generic drug companies in India, Canada, Brazil, and in many other countries have all got into the business. However, it is significant to note that generic drug companies do not invest in the R&D of future drugs. That is the main difference between these two types of companies. Pharmaceutical companies originate and innovate while generic companies imitate. There needs to be a healthy balance between these companies in order for continued innovation and affordable prices for the consumers.

IV. THE ABUSE OF COMPULSORY LICENSING AND ITS EFFECTS

The definition of compulsory licensing is, "when a government allows someone else to produce the patented product or process without the consent of the patent owner." Under the specification of the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), patents for products which include pharmaceuticals are protected for 20 years. However, there are provisions within the agreement that allow countries to approve compulsory licenses of pharmaceutical drugs.

Under normal circumstances, a person or company applying for a license needs to negotiate with the patent holder first under reasonable commercial terms before compulsory licenses are brought up. Only if that fails can the person or company apply for a compulsory license. In the case for pharmaceutical drugs, the government usually has to apply for a voluntary license and negotiate with the pharmaceutical company first. However, there are some extenuating circumstances that are listed under article 31b in the TRIPS agreement (national emergencies, other circumstances of extreme urgency, public non-commercial use, anti-competitive prac-

tices, or government use) where it allows the government to bypass the first requirement. Although these are some of the conditions that can be used to grant compulsory licensing, the TRIPS agreement does not specifically list the reasons that can justify compulsory licensing. However, any country that grants a compulsory license should fulfill one of the conditions listed under article 31b before granting a compulsory license.

This agreement has been controversial since it was first instituted in January 1995 because the vagueness of text listed under the TRIPS agreement opens up many opportunities for different interpretations among countries. The conditions set forth under article 31b were not always followed and no ramifications were handed out by the World Trade Organization. With a combination of the ambiguity in the TRIPS agreement and inaction by the WTO, many countries are taking advantage of the agreement by abusing the power of compulsory licensing. Although the original patent owner still has to be paid, the amount to be paid is also determined by the country granting the compulsory license. This creates a clear unfair advantage for the country granting the compulsory licenses.

Thailand, for example, overruled an international drug patent named Efavirenz in 2006, an anti-retroviral drug produced by Merck, an American firm. They approved a compulsory license for this drug and transitioned into a Thai made generic copy at half the price. Many critics have complained that Thailand did not fulfill the conditions of the TRIPS agreement. Furthermore, Thailand has overruled the patents of many more drugs. Brazil has followed suit and has been able to negotiate low prices by threatening the use of compulsory licenses. India, Malaysia, and Kenya have also been considering the use of compulsory licensing with a general disregard to the TRIPS agreement.

Another requirement for compulsory licensing is that it must be produced within the country that grants the compulsory license. There are exceptions however which include third-world countries that are incapable to produce the generic drugs themselves. Under such circumstances, it is possible for a country to import cheaper generics made under compulsory licensing. Legal changes were instituted in August 2003 to make this possible but it also specified conditions that would protect the patents of owners. One major concern for owners is the

diverting of these generic medicines to non-intended markets. This could drastically reduce the profits of patent owners.

The ultimate effect of compulsory licensing is that it drives down the profits of pharmaceutical companies and prices for consumers. It creates this effect by allowing other companies to make generic versions of the drug and sell it on the market. This type of licensing disregards the rights of the patent holders and enables competitors to compete with the original manufacturer. Usually, generic drug competitors enter the market after a patent expires. However, compulsory licensing allows competitors to enter the market while the patent is still in effect. These competitors are then allowed to take the patents and copy them without any consequence. Pharmaceutical companies lose millions of dollars from compulsory licensing since the protection provided by the patent is essentially taken away.

V. MIDDLE-INCOME COUNTRIES V. POOR COUNTRIES

The current problem with compulsory licensing is that there are middle-income countries such as Thailand and Brazil who are no doubt in need of treatment, but there are many African countries that are in worse situations both physically and economically. Richard Epstein, professor at the University Chicago Law, feels that there is nothing to stop foreign governments or aids organizations from purchasing these products at a negotiated price and then giving them away for free. For example, many people believe the wealthy military regime of Thailand can afford to spend more on healthcare. It may be just a matter of willingness.

Middle-income countries have also managed to negotiate successfully with the threat of compulsory licenses against drug companies or even approved compulsory licenses to save on their budget for other expenditures. However, many African countries who are even more in need cannot afford the treatment. Tadataka Yamada, president of the global health program of the Gates Foundation, feels that Brazil is not equivalent to Rwanda and can actually afford to pay. Additionally, Victoria Hale, the head of OneWorld Health, a non-profit pharmaceutical firm, expressed deep concern that compulsory licensing could be "the last blow" that pushes the industry from devoting itself in finding cures for the diseases of the poor world.

The general question that arises from this problem is that if both middle and low income countries allow compulsory licenses of patented drugs, who is going to pay for the R&D costs that will provide new drugs in the future? One answer may be that developed countries such as the U.S. might have to pay much more for them. Currently, the cost of antiretroviral combination therapy costs \$12,000-\$15,000 per year in the U.S. The same treatment costs only \$3,000 in Brazil and \$1,000 in India. This disparity may be justified considering GDP per capita income differences but Brazil's continued pressure and use of compulsory licenses might have negative ramifications in the future. Bruce Lehman, a lawyer who worked under the Clinton administration on the TRIPS agreement, agrees in the sense that he feels that is cynical for middle-income countries "to avoid paying their fair share of drug-discovery costs."

VI. AIDS AND CONTINUED INNOVATION

Research and development is essential to the creation of new drugs. One devastating disease is HIV/AIDS. This disease mutates and can develop resistance to current drugs. That is just one major reason that it is crucial to continue to stay ahead. Without incentive and necessary funding, developing new drugs that will not be possible for the biopharmaceutical companies.

There are 22 HIV/AIDS medicines available. Some of these drugs are ineffective for certain people. Since there is no cure, it is necessary for new drugs to be developed. Currently there are 35 new antiretrovirals and 19 vaccines being developed. These drugs are supported by patent protections that provide economical incentives for companies to continue to innovate.

VII. SOLUTIONS AND THE NEED FOR BALANCE

There is an obvious imbalance in the pricing of drugs among countries. Some countries should be paying lower prices while others should be paying higher prices. The freedom that was given to individual countries to grant compulsory licenses can be partly attributed to this problem. Those middle-income countries that have been aggressive in negotiating have benefited with lower drug prices while some low-income countries that do not have a stable government or system to have their voices heard have suffered. Countries such as Brazil and Thailand have abused the use of compulsory licensing by granting compulsory licenses for many

drugs that are not intended to treat a life threatening illness such as AIDS.

There is not a clear answer on how to solve the pricing of drugs since there is even a great disparity in incomes among the citizens of the United States. Many people who are in the lower class making \$20,000 per year are unable to pay \$20,000 in drug costs. Diverse variables need to be considered when determining the price of drugs. GDP per capita income may be used among the pricing among individual countries but it should only serve as a guide. Per capita income may not be as effective as determining the pricing of drugs individually on a case by case basis. Income levels can be tiered in each country and prices of drugs can also be sold based on different income levels. Currently, higher income earners in the U.S. pay a higher tier tax rate and the pricing of drugs can follow a similar model. Tax returns or other documentation can be used as proof of income. This way higher income earners can help subsidize the low wage earners. There should also be an effort to create an international regulation on how much each country is required to spend on healthcare for its citizens based on the GDP of the country. As a result, all countries will be spending the same percentage based on GDP.

There needs to be a balance where it is feasible for lower wage earners to have access to drugs while pharmaceutical companies can still recover costs and make a profit. In order to achieve this, the WTO should monitor and regulate how much each pharmaceutical company can charge for each drug. Negotiations between pharmaceutical companies and governments in drug prices have been ineffective simply because each side is acting in their own best interest.

In order to protect the interests of the pharmaceutical companies there needs to be strict regulations and laws that prevent arbitrage. Parallel exportation of drugs sold cheaper in a low income country and sold to high income countries can destroy the integrity of the system. Quantities of drugs dispensed for every individual should also be strictly monitored to prevent arbitrage.

CONCLUSION

In summary, it is crucial that patents of pharmaceutical drugs be protected. The importance of intellectual property rights is especially high for phar-

maceutical companies since firms spend billions of dollars each year with the majority of all expenditures on the research and development of drugs. Compulsory licensing and especially the abuse of it will hinder pharmaceutical companies from recovering expenditures and reducing the incentive to innovate. On the other hand, compulsory licensing may benefit many consumers in the short run by lowering prices and increasing access to these drugs. However, the abuse of compulsory licensing may also harm consumers in the long run from reduced incentives of the innovation of drugs. There is no real clear solution to this problem since poverty and disease exists around the world. This is why it has been controversial. One thing is clear, the amount of time and money spent in the research and development of a drug is crucial because it helps ensure the effectiveness and safety of the drug for the people who use it. Pharmaceutical companies are willing to take this risk because of patents and will continue to innovate as long as there is patent protection.

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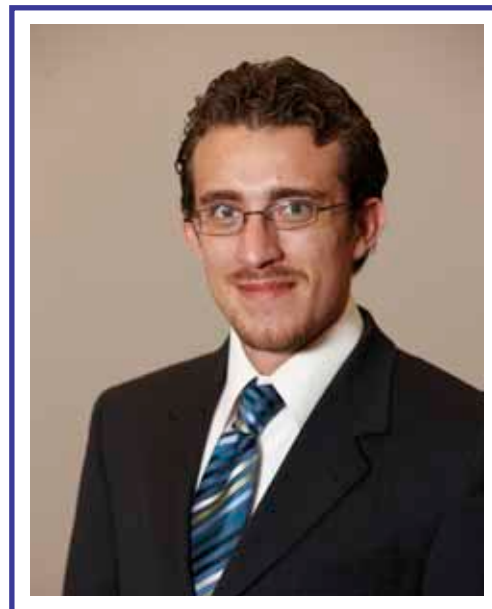
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AN EXPERIMENTAL SETUP TO IDENTIFY THE GEOMETRICAL CORRELATION BETWEEN UPPER AIRWAY OPENING AND HYOID BONE DISPLACEMENT: DATA FOR A POTENTIAL OBSTRUCTIVE SLEEP APNEA TREATMENT



BY JUAN C. PLATA

ABSTRACT

The strong correlation between hyoid bone location and upper-airway geometry has led to the development of multiple surgical procedures to help treat obstructive sleep apnea (OSA) (Johal 2007). The long term success rates of many of these surgical procedures have been unsatisfactory. This research's objective is to find a better understanding of how hyoid bone displacement affects the upper-airway geometry in order to develop better treatments for OSA.

INTRODUCTION

Obstructive sleep apnea is a common sleeping disorder characterized by repetitive partial or complete obstruction (Fig.1.) of the upper airway during sleep (Yucel 2005). These

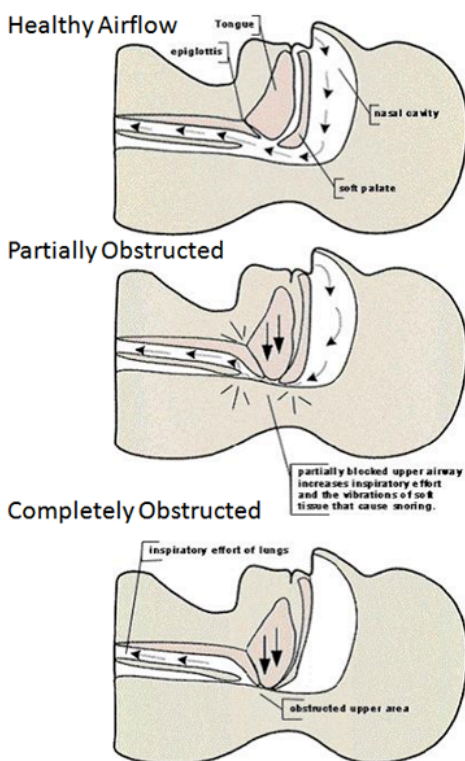


Fig.1. Partial and Complete Obstruction of Upper-Airway

obstructions can be divided into three categories: retro-palatal obstruction alone (type 1), both retro-palatal and hypopharyngeal obstruction (type 2) and hypopharyngeal obstruction alone (type 3) (Bowden 2005). These obstructions arise from both physiological and anatomical differences in patients with OSA: shortened cranial base with reduced anteroposterior skeletal dimensions, hyoid position, increase in soft palate length and thickness, narrower pharyngeal airway due to fat infiltration, reduced pharyngeal muscle tone, and increased weight of the soft tissue of the neck (Johal 2007, Yucel 2005). Complete upper-airflow obstructions lasting for at

least 10 seconds are termed apnea, while those resulting in more than 50% reduction of oronasal airflow and 3% decrease of ongoing paO_2 are termed hypopnea. The apnea hypopnea index (AHI) indicates the mean number of apneas and hypopneas per hour of sleep. AHI values divide OSA into three severities: mild ($5 < \text{AHI} < 15$), moderate ($15 < \text{AHI} < 30$), and severe ($\text{AHI} > 30$) (Herder 2005). Common symptoms of OSA include fragmentation of sleep, reduced blood oxygen levels, and excessive daytime somnolence. Severe OSA, if untreated, can result in higher mortality rates from cardiovascular disease as well as hypertension, myocardial infarction, and cerebrovascular disease (Herder 2005, Richard 2007, Yucel 2005).

Current non-invasive treatments for OSA include mandibular repositioning appliances (MRAs) for mild to moderate OSA (Fig.2) and continuous positive airway pressure (CPAP) for more severe cases (Fig. 3). MRAs increase retrolingual space in order to prevent upper-airway obstructions (Herder 2005). On the other hand, CPAP machines use positive pressure to keep the upper-airway open. Although CPAP machines are the preferred treatment for severe cases of OSA, compliance with this treatment is as low as 50% due to its inconvenient side effects (Richard 2007).



The poor adherence to CPAP devices has led to the development of numerous surgical procedures aimed at targeting the physiological and anatomical anomalies discussed previously. In particular, hyoid position has fostered procedures including numerous variations of Hyoid Suspension. Efficiency studies of these procedures, particularly long-term efficiency, are still lacking. Hyoid suspension alone is often not sufficient to treat severe cases of OSA (Hierl 1997). However, incorporation of hyoid sus-

pension to multilevel surgery for obstructive sleep apnea (genioglossus advancement (Fig.4.), uvulopalatopharyngoplasty (Fig.5.), and hyoid suspension (Fig.6.) proved to increase the efficacy of the treatment (Verse 2005).



Fig.4. Genioglossus Advancement (Brian 2008)



Fig.5. Uvulopalatopharyngoplasty (Brian 2008)

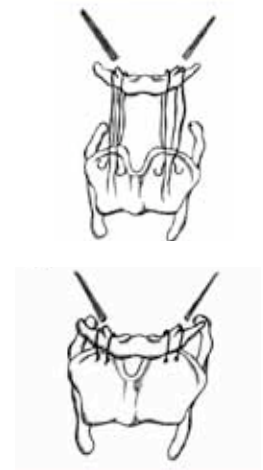


Fig.6. Hyoidthyroidpexia (a type of hyoid suspension). Taken from (Herder 2005:743).

Although there is a clear correlation between hyoid position and upper-airway dimensions, it is still uncertain exactly how hyoid bone displacement affects the upper-airway opening. More specifically, data concerning how displacement and pulling force of the hyoid bone affect the upper-airway geometry is not available. In this study, hyoid bone pulling force and anterior displacement will be measured, while monitoring the changes of airway dimensions to determine an optimal hyoid displacement to

maintain an appropriate upper-airway opening. Considering that the changes in body mass indexes and pharyngeal muscle tone can potentially hamper long-term results for many of the surgical procedures described earlier, the proposed approach of measuring optimal hyoid bone displacement and an associated pulling force for the desired airway opening could allow a nocturnal treatment that can avoid such long term complications.

CONFIGURATION OF MEASUREMENT SYSTEM:

As shown in Figure 6, a load cell and a linear variable differential transformer (LVDT) are used to measure the hyoid bone pulling force and the corresponding linear displacement. The load cell used in this measurement is a Honeywell Model 11 sub-miniature Load Cell with an operating range of 0.33lb to 1000lb with a linearity ($\pm 0.5\%$ full scale), hysteresis ($\pm 0.5\%$ full scale), and non-repeatability of ($\pm 0.1\%$). For the displacement measurement the LVDT is a preconditioned 75S2DC-1000SR from Sensotech with linearity ($\pm 0.25\%$ full scale) and ripple voltage (25mV RMS). A medical fiberoptic scope is used to obtain visual images of the upper airway changes.

Solidworks 2007 was used for all CAD applications and LabView 8.2.1 was used for all programming of the data acquisition experimental setup. Force and displacement data were loaded into LabView 8.2.1 using a National Instruments (NI) USB-6009 multi-function I/O device. A KWorld Xpert DVD Maker USB 2.0 Video Capture Device along with the NI IMAQ-USB was used to input video into LabView. Image processing was accomplished using NI Vision Assistant 8.2.1. An articulating arm boom stand from Edmund Optics, an airway mannequin, and a Sony VAIO laptop (1.6 GHz Intel Centrino, 1GB RAM, Windows XP Service Pack 2) were also employed.

METHODOLOGY

In order to measure changes in the upper airway due to hyoid bone displacement a horizontal incision will be made through the upper layers of the epidermis to reveal the hyoid bone. The hyoid bone will then be clamped and attached to a magnetic hook that is connected to a load cell (having a magnetic hook allows the setup to be covered in plastic in order to maintain a sterile operating environment.). The load cell and LVDT are incorporated into a custom handle that will limit hyoid displacement to vertical motion (Fig.7). A scope will then be

introduced through the nasal passage in order to record airway geometry changes at the level of the epiglottis. In order to maintain the airway open during the procedure an endotracheal tube (ETT) will be inserted through the mouth. The ETT will have reference geometries to allow for measurement calibration from the scope images. Once ready to start recording the force and displacement, the surgeon will turn on a switch that will collect and save these measurements, along with pictures of the upper airway from the scope every 1/7 second. From all of the data points gathered those representing critical conditions such as maximum displacement and maximum/ pulling force will be used for further processing.

NI Vision Assistant will be used to process the images in order to correct any perspective and/or spherical distortions, as well as to obtain real world measurements from the snapshots. Thirty-three real world coordinates from the grid were used to correct the non-linear distortion of the scope using the user defined points calibration option from the NI Vision toolbox. NI uses these coordinates and applies a Bi-linear interpolation to correct the distortion of the image (Fig.8). The calibration was considered appropriate when the average percent error due to distortion was less than 5%. Percent error was

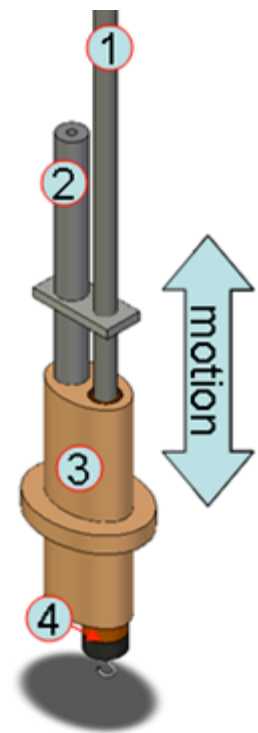


Fig.7. (1) Guide Rod, (2) LVDT, (3) Custom Handle, (4) Load Cell

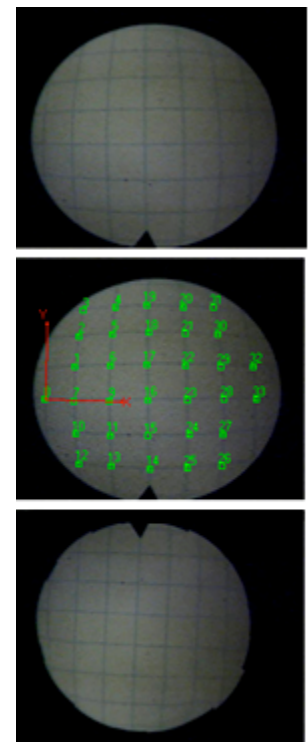


Fig.8. Distorted (Top), Calibration (Middle), Corrected (Bottom)

calculated by comparing the measurement of the side of one of the squares at the center of the scope with the measurements of sides of other squares within the scope's view, including the squares at the edges.

After the spherical distortion is corrected real world dimensions are added to the snapshot. Using the NI Vision Assistant's simple calibration, two points of known length within the image are selected in order to determine how pixels can be translated into distances in each image. In order to obtain real world dimensions for the images inside the upper airway, geometrical references were placed along the ETT using non-toxic white permanent markers. Using the airway mannequin, different references were tested. It was decided that multiple markings along the tube would be used in order to avoid perspective distortions. From the multiple references, one that is close to the desired measurement will be used to measure a known chord length. Visibility of the references has been tested using the mannequin but the incorporation of bodily fluids might drastically decrease visibility. This experimental procedure will be tested in cadavers at the University of Nevada School of Medicine in Reno later in the fall of 2008.

RESULTS AND DISCUSSION

The experimental setup, including software and hardware design, has been finalized (Fig.9). Image processing is currently still being perfected in order to obtain reliable real world units from the images. Spherical distortion percent error has been reduced to less than 2% using NI Vision Assistant's user defined points calibration and bilinear interpolation. Tests to determine the effects of

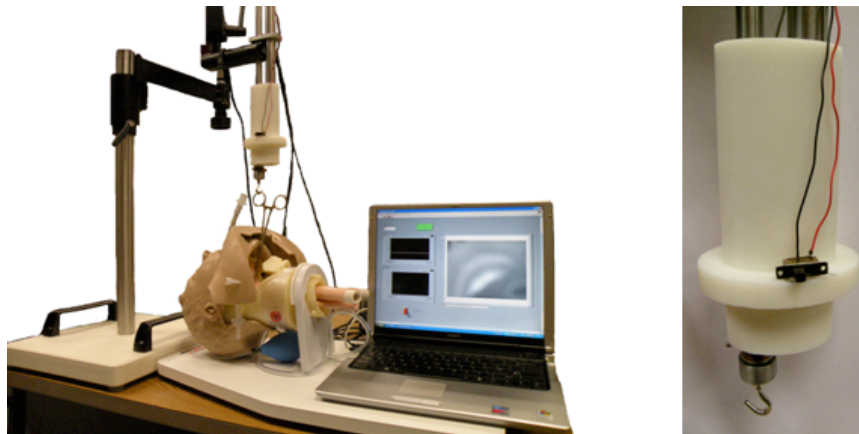


Fig.9. Experimental Setup (top-left), Custom Handle w/ Switch (top-right), LabView Front Panel (bottom-left)

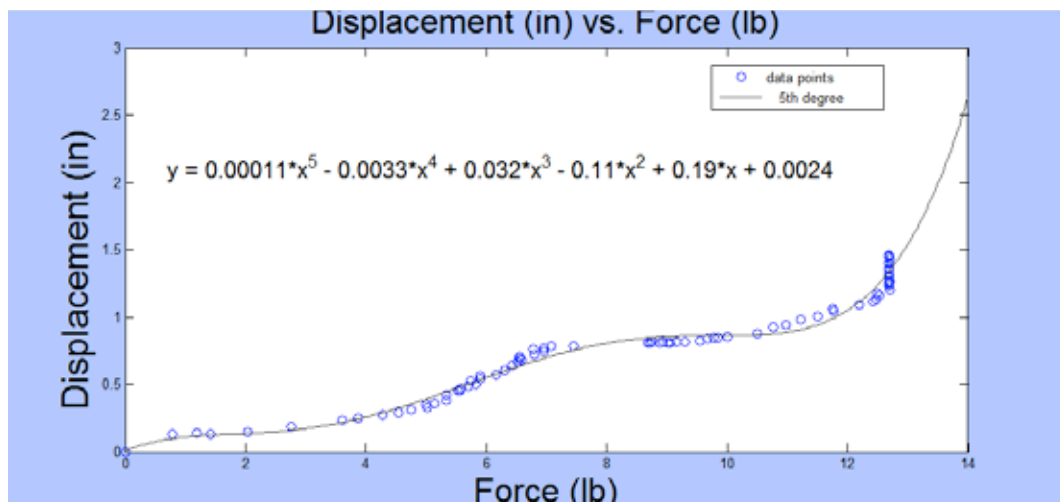


Fig.10. Example plot between vertical displacement and pulling force. Data points were collected using the experimental setup described previously using the airway mannequin

perspective distortion on the measurements are still pending and will need to be completed before the experimental setup can be tested with cadavers at the University of Nevada School of Medicine Reno campus.

Once measurements are obtained a relationships between vertical hyoid displacement and pulling force will be obtained using MATLAB (Fig.10). Relationships between pulling force and airway dimensions will also be collected and interpolated.

CONCLUSION/FUTURE RESEARCH

An experimental setup to better understand how hyoid bone displacement affects upper-airway airflow is complete. Hyoid bone vertical displacement will be measured using an LVDT while tension force will be obtained from a load cell connected to the clamps used to pull the hyoid bone. Using LabView force and displacement data, along with snapshots of the upper-airway near the epiglottis, will be collected every 1/7 second. A better understanding of how these variables affect airflow in patients with OSA will be critical to develop a treatment for this condition. Current noninvasive solutions such as MRA are not always applicable for severe OSA. NCPAP, another noninvasive treatment, faces much resistance from patients due its high level of discomfort. The failure of these treatments has led to numerous surgical procedures that have good short term results but lack long term reliability.

Further research is required before data can be collected from actual OSA patients. Perspective distortion error analysis and correction is still missing before testing can be implemented in cadavers at the University of Nevada School of Medicine in Reno. Testing in cadavers will be required before clinical trials can be approved. From the clinical trials statistical data concerning how hyoid pulling force and displacement affect the upper airway passage will be used to determine an ideal force and displacement to maintain the airway open while OSA patients are asleep.

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THE RELATIONSHIP BETWEEN EXOTIC DANCING AND CHILDHOOD SEXUAL ABUSE

BY SANDRA RAMOS



ABSTRACT

This research deals with women in the sex work industry, mainly exotic dancers. The reason for this research is to identify a relationship between childhood sexual abuse (CSA) and later involvement in sex work. Sexual abuse can change the course of someone's life forever, affecting everything from their physical health to their decision making processes. Some women who experience sexual abuse may become substance abusers as a way to numb the emotional pain they feel from their early sexualization. For some women exotic dancing may be just a job, a means for acceptance, or an outlet for power. Future research is still needed to determine further reasons for involvement in the sex work industry.

INTRODUCTION

The purpose of this research is to achieve an improved understanding of individuals involved in the sex work industry, especially female exotic dancers. It is thought that the reason why so many women enter into the sex work industry is related to childhood sexual abuse (CSA). Any child can fall victim to sexual abuse regardless of race, education, or religious affiliation. Women are significantly more likely to experience a sex-related trauma than men. Those who suffer from these negative events are often associated with a more accepting outlook concerning sex-

uality and related behavior. If there were any people who were thought to be most accepting of sexuality it would be those involved in the sex industry.

Suffering from a traumatic event has been shown to be an issue that severely affects people (Broman, 2003). Childhood sexual abuse can have several different outcomes when it comes to the wellbeing of its victims. These outcomes can be physically and emotionally debilitating, affecting every aspect of a person's life. This research will help contribute to the field of psychology because it examines the relationship between sexual trauma and later attitudes toward sexuality when it comes to exotic dancers. There are many different groups and sub-groups of people that have yet to be fully explored. Exotic dancers are one of these sub-groups. Any study dedicated to understanding a certain group of people will contribute to the field of psychology.

LITERATURE REVIEW

There has been much research done on CSA and some research done on exotic dancers, but rarely do the two subjects come together. This research is similar to, but not based upon, an evaluation done by Evelyn Abramovich. She provided an assessment of research studies exploring the relationship between CSA and

later involvement in sex work. While this research is based solely on female exotic dancers her review included mixed gender samples and research on other sex work populations.

The term exotic dancer can have different meanings depending on context. Exotic dancers, also known as strippers, are performers. They provide erotic entertainment by slowly undressing to music. Some exotic dancers perform inside of strip clubs while others choose to be private dancers. Private dancers are contacted through an agency to go and perform at a specific location. They provide services like Strip-O-Grams, much like telegrams, or they host bachelor parties. These type of performers are not called exotic dancers or strippers, although there are some aspects of the job that seem similar, they are referred to as entertainers. The most popularized form of exotic dance takes place in the clubs (Wilson, 2008). Some businesses have a tendency to be referred to as Gentlemen's clubs depending on the quality of the establishment. The term Gentlemen's club was most commonly known as a Members Only club for upper class men. Now it is a euphemism for strip clubs.

Another establishment for exotic dance is the bikini bar. These dancers perform similar routines but are not obligated to remove all of their clothing. The dancers who work in the strip clubs take part in a number of different tasks. Their routines may include stripteases, lap dances, table dances, and recently the most popular variation of exotic dance, pole dancing (Wilson, 2008). In the current years pole dancing has become quite mainstream inside and outside of the clubs. Pole dancing is a type of dance performed around a stationary vertical pole. There are gyms throughout the country that offer pole dancing classes as a means of staying physically fit. There are also now services which allow people to have stripper poles installed in their homes.

Another variation of exotic dance is the lap dance. This type of dance is filed under the category of private dance. It involves the dancer giving a one-on-one dance to a paying customer. Lap dances include more physical contact between the dancer and the customer. Another

private dance is the table dance. A table dance is much like a strip tease, but instead of performing for an entire audience on a stage, the dancer performs in a secluded part of the club for either one or more customers while on a table (encarta.msn.com).

American striptease is rumored to have begun in Burlesque theatres. Burlesque is a type of live entertainment that covers a variety of acts such as singing, dancing, comedians, and strip teasers. Soon after Burlesque began it became less about variety and more about the striptease. Soon the words Burlesque and striptease became practically synonymous. Not long after striptease became the main component of Burlesque society decided it was time for a clean-up, this suppression eventually led to the end of Burlesque (McArthur, 1992). The 1960s brought about an alternative form of the Burlesque striptease in the form of go-go dancers. These women would perform in cages or on platforms inside dance clubs. While most go-go dancers performed clothed there were instances where girls would go topless. Go-go dancers were featured in many night clubs and would often appear on television shows.

As years went by, the cultural expression of sexuality changed. The art of striptease would be popular one year and unacceptable the next. In the past thirty years striptease has made a comeback thanks in part to musicians featuring exotic dancers in their music videos. Although the traditional style of Burlesque has not made a complete comeback, it is definitely on the rise. Many Las Vegas clubs feature go-go dancers with Burlesque inspired attire and there is one night club in Southern Nevada that strictly adheres to the early forms of burlesque dancing which included no nudity.

Although the art of Burlesque is slowly making it's way back into the spotlight, exotic dancers still lead the race when it comes to the art of striptease. Many strip clubs throughout the country are seeing a rise in profit and status as stripping becomes more and more acceptable. The strip club industry is becoming larger and more mainstream; some clubs now require specific attire upon entering. While some clubs in parts of the United States are still low key

and less exclusive, Las Vegas has been deemed Sin City and the Devil's Playground thanks in part to its large number of strip clubs. Although Las Vegas has made a name for itself other states have definitely made ripples when it comes to strip clubs. In New York a man sued a strip club when an exotic dancer kicked him in the eye while performing a lap dance (7online.com). Probably the most infamous case involving exotic dancers happened in October 2003. A man named Robert McCormick, a CEO of a company which provides information technology services, racked up almost a quarter of a million dollar bill on his company card at Scores, a popular New York gentlemen's club (Hutchinson, 2005).

In today's current society teenage girls and young women are repeatedly bombarded with the concept that their sexuality and physical appearance determines their value as a human being. The book "So Sexy So Soon" by Jean Kilbourne and Diane Levin illustrates how children are becoming sexualized at a young age. This does not always include actual sexual abuse. Sometimes young girls feel they have to be sexy to compete with their female peers for the attention of young boys. While most women have used their feminine charm at one point or another in life, they find that it can have its drawbacks. Young women find that certain parts of their bodies are sometimes thought to exceed other facets of their personality, such as their intellect, strength, or wit. With the female form often being the focus of male attention all girls eventually learn the significance of their bodies. When women learn the influence their sexuality has on their male counterparts they sometimes use it to their advantage. These women often receive special treatment and does not take much for women to realize they can successfully capitalize on their bodies.

One reason young women may become exotic dancers is because the money is good and the only job prerequisite, that is highly enforced, is that the dancers be 18 years old. While not their dream job, the decision to become an exotic dancer is sometimes out of desperation. When young females lack education and adequate work experience they often find themselves involved in the sex work industry. The reason

why there may be so many young girls involved in the sex industry in Las Vegas may be because of the poor education system in Nevada. According to LasVegasNow.com, Nevada is ranked as one of the worst states in the nation when it comes to high school drop outs.

Even though body for money is an unfair trade, in today's current materialistic society, money translates to superiority. This need for superiority can be a way of making up for childhood abuse. It is too easy to say that there is a direct link between early sexualization and exotic dancing. The decision to enter into the sex industry can be based on many different motivators. Although correlation does not equal causation, there is often a strong relationship between childhood sexual abuse and adult sex work. According to an article by J.K. Wesely (2002), 60% of girls 13 or younger have experienced involuntary sex in the form of incest, molestation, rape, or coercive sexuality. When young females are exposed to abuse the need for early independence comes into play. Running away is one approach that victims of sexual abuse resort to as an escape.

Women who experience CSA may develop a number of disorders including post-traumatic stress disorder (PTSD), eating disorders, anxiety, lowered self-esteem, and general psychological stress. CSA can cause both short-term and long-term harm. This harm can be physical, emotional, social or all of the above. The most common physical problem that a child may face when a victim of sexual abuse is sexually transmitted diseases. One physical problem that may develop later in life is Vaginismus. Vaginismus is a condition in which the muscles surrounding the vagina contract involuntarily, the vagina stays closed making it impossible for intromission. There is no clear cut cause for this sexual disorder but it is believed that fear and anxiety play a key role (Nobre, 2008).

Females who experience this anxiety or fear as a result of their early sexualization may find conflict in romantic or interpersonal relationships later in life (Broman, 2003). Sexual abuse may also bring about issues in the mental development of a child. Any stress, whether it be due to sexual abuse or not, has the ability to cause changes in brain functioning and development.

Females who experience this abuse later become emotionally unstable. Sometimes the women shut themselves off from others and develop a more introverted personality. They begin to partake in destructive behavior such as overeating and poor hygiene. These are ways in which some victims of sexual abuse may try to make themselves less attractive to men. They think that if they no longer look desirable to men they have a lesser chance of being victimized again. This damaging behavior can lead to an eating disorder such as bulimia. Just like any addiction some females may feel the need to cure the emotional pain with a physical remedy. They begin to binge eat and later feel guilty, resulting in their purging (Moyer, 1997). This unhealthy cycle can affect many women who were victims of childhood sexual abuse.

Some females develop post-traumatic stress disorder (PTSD). PTSD is defined as an anxiety disorder that can occur after a traumatic event. A traumatic event is a type of event when a life or the lives of others are in actual danger. According to a correlational study in the *Journal of Violence Against Women* (Berg, 2006), females who experience everyday sexism may also develop symptoms of PTSD. While not all women are victims of violent behavior or sexual assault the majority of women have been subjected to sexually objectifying remarks, demeaning behavior, gender role stereotyping, and the use of sexist language. All of these actions can slowly tear at a woman's self-esteem and cause her to develop symptoms of PTSD.

People who experience PTSD often feel afraid or that they have no control over what is happening. Two to three percent of the population is diagnosed with post-traumatic stress disorder; most of these diagnoses are women. Some females experience Immediate PTSD where symptoms are present right away while others go through Delayed PTSD. Delayed post-traumatic stress disorder is when a person seems fine and later develops a sudden influx of symptoms. Delayed PTSD is thought to be the more severe form of post-traumatic stress disorder. People who experience post-traumatic stress disorder develop a feeling of helplessness and often go through depression. Other symp-

oms include recurring recollections or experiencing the trauma, numbing of emotional responses and avoidance of stimuli associated with the trauma (Davison, 2006).

Many women experience depression and anxiety as a result of their childhood abuse. Some of these women may turn to substance abuse as a form of emotional escape. Drugs may be used as a means to forget their abuse or to avoid abuse-specific memories. An article by Messman-Moore and Long (2002) describe this type of avoidance as a "chemically induced dissociation, invoked as a chronic coping response to aversive affects, memories, and situations." Women may use alcohol and other substances to help ease the grief associated with their childhood abuse. The overuse of this coping mechanism may lead to addiction. One issue besides the physical and emotional problems associated with addiction is the increased risk of re-victimization.

According to the *Journal of Violence and Victims*, not only are alcohol and drug use associated with CSA, but they have also been identified as factors involved in adult sexual assault. Regardless of addiction, women who drink are more likely to meet possible sexual predators in the setting in which alcohol is consumed, places like bars, night clubs, and fraternity parties where alcohol is often free flowing with no limits on an individual's consumption. These types of environments put women at an increased risk for sexual assault because of the way they are perceived. Men perceive women who are drinking as more sexually receptive than those who are not. The more intoxicated a woman is, the less likely she is to label forced or coerced sex as rape (Messman-Moore, 2002). This type of sexual assault occurs because the victim is unable to consent due to her level of intoxication. Being intoxicated makes it harder for women to recall the events of their attack, forcing them to wonder if it was consensual or nonconsensual. When women have difficulty remembering the exact events they are less likely to report the incident. Addiction is not always an outcome of CSA but when it is, a woman's judgment may become clouded and put her at an increased risk for re-victimization.

Another outcome of CSA is the exact opposite. Some women become extreme extroverts. Their early sexualization may sometimes raise their sexual assertiveness later in life (Livingston, 2007). Adult survivors of CSA sometimes develop sexual problems such as sexual compulsivity, sexual preoccupation, and risky sexual behavior (Abramovich, 2005). The sexualization that they experienced as young girls taught them how to use their bodies to manipulate men. Some girls found that by acting in a provocative way and accentuating their sexuality not only garnered them attention but also a feeling of power.

It could be debated that exotic dancing expresses the ways in which women try to obtain a feeling of power in a male driven society. They use their bodies to make a living. While others spend their day pushing paper at an office they are dancing on a stage. All they have to do is take off their clothes and they get cash on the spot. Although it seems like an easy job there is much more that goes into exotic dancing. Some girls take off all of their clothes and often are involved in close physical contact with different people every night. Exotic dancing not only requires physical skill it also takes a type of self-assurance that not all people possess. Not all women are confident enough to put their bodies on display, regardless of previous sexual abuse. Females who have been sexually abused often find a decrease in their self-esteem (Downs, 2006). Exotic dancers use their bodies to encourage men to give them money straight from their pockets. Not all women have this type of influence over men. However, the feeling of power is weighed down with obstacles.

Like all power, it is never without a price. In the same moment that power is gained it can also be eliminated. Not all customers respond with admiration. It is the customer that decides which woman they will or will not pay for. Women receive the confounding message that the same body that gives them power can also be violated and degraded. Their sexualized bodies, once the source of power, now becomes an object of subjection. Dancers are often ignored and sometimes ridiculed by the customers (Wesely, 2002). The feeling of power slowly leaves and the reality of their job sets in, they are there to provide entertainment for the customers. Their sexual objectification becomes a way of reminding

women of their lesser status. The demeaning of women is not limited to the strip club setting. There are over one hundred pages in the 2008 Las Vegas, Nevada phone book dedicated to the advertisement of entertainers. The advertisements often include the phrase, "Don't like, don't pay." This statement reinforces the idea that women are products.

There are many misconceptions when it comes to female exotic dancers. Many of them are thought to be undereducated and not progressing forward in life, this is not true. There are many college campuses that house exotic dancers. The only reason they dance is to pay for school. These women are using their bodies to help pay for the expansion of their minds. Another misconception is that all dancers were once victims of sexual abuse. Although the number of women involved in sex work who were victims of CSA is high, there is no "one size fits all" proof that all dancers were once sexually abused. A common misconception is that women involved in exotic dance are promiscuous. All women are different and society should not blanket all female dancers based on previous encounters with promiscuous women.

CONCLUSION

This research was an evaluation of similar studies and research. The objective was to gain a better understanding of exotic dancers in terms of their past sexual history and how it may have affected their decision making process, attitudes toward sexuality, and mental and physical health. This research is not without limitations. One of the most important is that it focused mainly on exotic dancers but there are many facets of the sex industry, from prostitution to adult film actors. Future research should investigate male exotic dancers, their work conditions as opposed to female working conditions and how that affects their personal lives. Maybe poor working conditions have some type of correlation with depression.

FUTURE RESEARCH

Future researchers should also look into females with no history of CSA or trauma. Another issue that could be looked into is family life, mothers in the sex industry, their reasons for their work choices. Future research should not only focus on CSA and substance abuse but it should also

look into the development of psychological problems later in life due to work in the sex industry. Despite limitations, all research concluded that childhood sexual abuse is a factor when it comes to feelings regarding sexuality and that there is a strong correlation between CSA and later involvement in the sex work industry.

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STOP SNITCHIN'

BY PRECIOUS RIDEOUT



ABSTRACT

The purpose of this study is to probe a controversial criminal silent code movement, "Stop Snitchin'" in anomic communities and the power they hold over neighborhood residents as an obstruction to law enforcement. To understand this urban code of silence, theoretical perspectives from the issues of workplace whistleblowing and the police code of silence will be evaluated. The "Stop Snitchin'" movement, an informal street code to not inform the police of criminal activity, has been translated into media via television and music. It is shrouded with secrecy and honor by word-of-mouth, seen on t-shirts and neighborhood murals as a warning to witnesses of crime, and it is heard and affirmed to bombastic beats of rap music. As a growing cultural norm, this community attitude has impacted criminal justice processes, especially in perpetuating a culture of violence as it relates to the strained relationship between minority residents and local police authorities.

INTRODUCTION

In 2004, the first "Stop Snitchin'" DVD was made in Baltimore, Maryland by Rodney Bethea and "Skinny Suge," a local street celebrity. The DVD prompted Maryland politicians and the police department to push for new laws against witness intimidation. However, this violent movement has been growing in urban cities since mid-1990s (Stop Snitching, 2008). As witness intimidation takes hold on city

residents, crimes across America go unsolved. On these streets, the old saying is true: one can literally get away with murder. On October 16, 2002, Angela Dawson, her husband, and their five children were burned to death in their Baltimore home by a unidentified drug dealer because Dawson was informing local police of criminal activity in her neighborhood (Chideya, n.d.). Mia M., single mother of five, was violently pursued, threatened, and shot at by local street thugs when she attempted to testify in court against a known drug dealer. According to police reports, Mia's attackers have not been identified (Amber, 2006). The Contra Costa Times of Walnut Creek, California reported that local Pittsburgh High School students have even taken the violent tenet school-wide by wearing "stop snitching" t-shirts, some wearing it because "it's cool" (Becker, 2006). Tim Galli, Pittsburgh High Principal, intends to ban the t-shirt on his campus to combat the inciting message (Becker, 2006).

Investigation begs the following questions: Is this strictly a criminal issue for ghetto inhabitants blighted by an infestation of crime lords, dilapidated streets, and decayed neighborhood morale? Or have we already seen this false anti-hero paraded throughout American history? In what other facets of life has the "stop snitching" attitude manifested itself into more than just an act of protective loyalty? An ethical distinction between a "snitch" and a "witness" yields the importance in the ability to act

upon the freedom to protect one's environment, and to understand the extent of criminal activity, the capacity of criminal activity, and changing cultural norms.

LITERATURE REVIEW

CONTENT ANALYSIS

In the workplace, whistleblowers are generally defined as "employees or former employees who report misconduct to persons who have the power to take action" (Miethe & Rothschild, 1999). However, most commonly, Miethe suggests that such individuals are labeled as "snitches," "tattletales," "finks," "rats," "ethical resisters," and "people of conscious," amongst other epithets (1999). In a study conducted by Miethe and Rothschild (1999), employees from 292 different workplaces, six organizations, and data from the U.S. Merit System Protection board of 13,000 federal employees were analyzed, finding little to no difference in sociodemographic characteristics of whistleblowers from non-whistleblowers (Rothwell & Baldwin, 2007). Furthermore, Near and Miceli (1996) conducted empirical research on the causes of whistleblowing in various workplace dimensions from fast food restaurants to federal agencies (Rothwell & Baldwin, 2007). They concluded that individual and situational variables tend to justify reasons of blowing the whistle, but situational variables further explain these reasons. (Rothwell & Baldwin, 2007; Miethe & Rothschild, 1999). Size of the organization, supervisory status, and tenure were investigated rather than sociodemographic or personality factors.

Miceli and Near (1992) discovered that whistleblowing is positively related to organization size because whistleblowing is less likely to threaten important work or relationships. As size of the organization increases, so does the likelihood of whistleblowers since larger organizations tend to have structural procedures in place to protect whistleblowers (1992). Generally, there are positive associations between supervisory status and whistleblowing given that a supervisor's role includes the consistent regulation of misconduct from subordinates, thus allowing blowing the whistle a common or probable option for worker misconduct (1992). Lastly, an individual's amount of tenure influences the likelihood of whistleblowing because a senior worker usually has more vested authority in the organization with a high level of commitment, or is close to retirement (Miceli & Near, 1992). However, Rothwell and Baldwin (2007) make it clear that

empirical data (Jos, Tompkins, & Hays (1989); Miceli & Near (1988); Sims & Keenan (1998); Singer, Mitchell, & Turner (1998) do not suggest tenure is associated with whistleblowing. It is only mentioned in this current study because of the police-civilian relationships that demonstrate increased silent codes occurring over time within the police culture (Rothwell & Baldwin, 2007).

In addition, Rothwell & Baldwin (2007) argue that whistleblowing-enhancing mechanisms like policy manuals, mandatory reporting policies, polygraph examinations, and internal affairs units are generally successful because they promote comprehensive procedural due process (as cited in Near, Dworkin, & Miceli (1993); Victor, Trevino, & Shapiro (1993). Positively associated with whistleblowing, policy manuals encourage the action by outlining specific rules, procedures, rights, and expectations of blowing the whistle on employee misconduct. Manuals help employees recognize what misconduct looks like, how to report misconduct, and the consequences of failing to report it. Mandatory reporting guides employees to possess a sense of duty and obligation when deciding whether or not to call out workplace misconduct (Miceli & Near, 1992).

There are minimal chances taken when reporting misconduct against polygraph tests when they are accessible or required. Individuals are more likely to blow the whistle when they know a polygraph will detect even the slightest idiosyncrasies. Finally, the existence of an internal affairs unit or investigative human resources board facilitates whistleblowing. Its ability to maintain control and ensure that specific policies are well-known and followed throughout the organization associates positive facilitation with blowing the whistle on misconduct (Near, Baucus, & Miceli, 1993).

Furthermore, Pelletier and Bligh (2007) describe leadership and ethical behavior modeling that preventatively facilitates worker morale and whistleblowing. Workplace leaders are responsible for inaugurating ethical behavior and values that guide the decision-making of those whom follow. When consistent and honorable standards are enacted and supported by organizational procedures, this system becomes a key contribution to the organization's culture (Schein, 1985). Greater organizational commitment and less employee turnover result in leaders facilitating an atmosphere of value, fairness,

and trust, implying that employees are motivated to remain loyal and truthful when opportunities to blow the whistle occur within the organization (Ambrose & Cropanzano, 2003; Korsgaard et al., 2002; Padgett & Morris, 2005).

Alfred Hitchcock once said, "I'm not against the police; I'm just afraid of them". However, much of America's citizens feel or have felt the same way about our law enforcement officers for decades, not only because they represent moral uprightness, but because they are known to have imbrued conduct and procedure. The code of silence is stronger within police groups rather than any other civilian group. Police officers are said to possess a higher, unmatched need to develop silent codes and personal protection because of the dangerous nature of work (Chin & Wells, 1998; Crank, 1998, Kingshott et al., 2004, Paoline, 2003; Skolnick, 2002). However O'Malley (1997) asserts that police agencies that condone such among its officers hold "loyalty over integrity." This "blue wall" (Kleinig, 1996) of silence is detrimental to public interest by undermining the respect and effectiveness of those sworn to protect. And in the course of protecting their own with the code of silence, officers frequently damage innocent third parties as well as the overall integrity of the criminal justice system (Skolnick, 2002).

In 2000, a nationwide study (Weisburd et al.) revealed that at least 52.4% of police officers agreed or agreed strongly that "It is not unusual for a police officer to turn a blind eye to improper conduct by other officers." In addition, the same study asserted that 61% of officers disagreed or disagreed strongly that "police officers always report serious criminal violations involving abuse of authority by fellow officers" (2000). Finally, various studies found many officers are hesitant to blow the whistle on fellow officers' misconduct (Chemerinsky, 2001; Christopher, 1991; Punch, 1985; Ward & McCormack, 1987), and many are willing to lie under oath rather than give up each other to disciplinary consequences (Chin & Wells, 1998; Mollen Commission Report, 1994).

Similar to that of workplace whistleblowing, whistleblowing in police agencies is positively related to organization size (Miceli & Near, 1992). Again, as size of the organization increases, so does the likelihood of whistleblowers since larger organizations tend to have structural procedures in place to protect whistleblowers. Supervisory status and tenure within

police agencies also relate to positive whistleblowing because of consistent regulation of misconduct and vested commitment within the organization (Miceli & Near, 1992).

Policy manuals, mandatory reporting policies, polygraph examinations, and internal affairs units are generally successful whistleblowing mechanisms for police because they promote comprehensive procedural due process (as cited in Near, Dworkin, & Miceli, 1993; Victor, Trevino, & Shapiro, 1993). All reasons previously stated are congruent with successful outcomes with police officers. However, the existence of an internal affairs unit yields two new variables that explain a structure-functional approach to whistleblowing in police agencies: work group assignment and police status (Hassard, 1993). Work group assignments, such as patrol and investigative units, facilitate silent codes especially due to daily unexpected encounters with criminals and the public, sometimes resulting in split-decision making that seemed fitting at the time, but are difficult to justify in retrospect (Klockars, Ivkovich, Harver, & Haberfield, 2000). Police status is essential among officers because "when 'everyday events conspire against [police],' the code of silence ensures that other officers will act in accordance with their collective well-being rather than their personal self-interest" (Crank, 1998). Whistleblowing violates this informal covering of officers by threatening the solidarity when officers feel browbeaten by intense media scrutiny, intolerant public citizens, and demanding police administration (Heck, 1992).

Moreover, Crank (1998) asserts that many police officers admitted that silent codes are necessary to do their jobs efficiently and effectively. Silent codes do not uphold officers to unrealistic expectations within judicial due process and releases officers from level public accountability.

In 2004, Baltimore street crime connoisseurs Skinny Suge and Rodney Bethea produced the infamous Stop Snitching DVD followed by its sequel months later. The street documentaries gained national attention while serving as a gruesome warning to self-named criminal informants to stop snitching on local criminal activity. The videos tarnished the reputation of a Baltimore-bred NBA star Carmelo Anthony, who made a cameo appearance. He later apologized, saying he would appear in a government-sanctioned video to counter the impact of

Stop Snitching (Dolan, 2005). The videos also lead to the conviction of two Baltimore police officers mentioned as taking bribes, robbing drug dealers, and selling drugs and weapons. In a Baltimore article, "Baltimore Cops Found Guilty of Corruption" (2006) officers Antonia Murray, 35 and William King, 35, were convicted 32 of 33 counts of robbery, conspiracy to distribute and possess with the intent to distribute heroin, marijuana and cocaine, conspiracy to possess firearms and other crimes.

National Public Radio commentator Siddhartha Mitter (2006) described the increasing number of police informants in inner-city communities, and the backlash hip-hop music and culture stands against "snitching." The street code mandates if you are real, you don't snitch; if you snitch, you get stitches—shot, stabbed, assaulted, murdered, or hurt in some form or fashion. Various hip hop music and artists, like "Killa Cam" Cam'ron and the Diplomats, Lil'Wayne, Scarface, the Game, and 50 Cent vocalize the violent mantra of guns, drugs, and the g- (gangsta) code of snitches who get stitches. Mitter (2006) goes on to remind listeners of the old cliché that "art imitates life," but in this crucial case, art is life. The idea is that "stop snitching" applies only to fellow criminals—declaring that police informants out for personal gain will be "dealt with" in the worst ways. But what can be said about thousands of families in these communities who are intimidated daily by the cold reminder to not tell if they were witnesses of criminal behavior in their neighborhoods? What can be said about Angela Dawson and her family who were burned like firewood in their home for seeking police help? What is plastered on t-shirts, neighborhood walls, music, and life in urban communities nationwide is that this deadly code of silence sanctions criminal behavior, pushing it further and further into mainstream social norms? There is reasonable distrust of police because of misconduct over the years, especially within urban communities; however, to look the other way or become the hood's "silent protector" is not the answer.

CONCLUSION

Throughout the literature, academic scholars and researchers have found similarities between reasons to enact silent codes. Fear of retaliation, ostracism, harassment, and physical threats facilitate a code of silence between individuals within various environments (Chin & Wells, 1998; Skolnick, 2000;

Skolnick & Fyfe, 1993). Permanent stigmatization, losing friends, exposure of one's own misconduct, and [in the case of street conduct, murder is definitely an option for those who leak damaging information] (Chin & Wells, 1998; Skolnick, 2000; Skolnick & Fyfe, 1993).

The research design for the study consisted of content analysis by researching multiple newspaper and journal articles. Media analysis was a major part in constructing foundational information in regards to this popular topic. Theoretically, the issues of whistleblowing in the workplace and the code of silence in police forces were comparatively used as a guideline to understand the implications of the "snitching attitude" in street crime and urban living. In the workplace, whistleblowers are driven to act especially when organizational morale is high, and when specific mechanisms that support whistle blowing are facilitated. In the police force, silent codes are generally deemed necessary to work performance, providing fellow officers with protection under the daily pressure of stress, media criticism, general public disdain, and unforeseen dangers. In the streets, reasonable distrust of law enforcement is pleaded, however, both criminal and working residents continue to live under lethal intimidation to keep their mouth closed at all costs— including the cost of life.

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A COMPARISON OF COGNITIVE DEFICITS BETWEEN BIPOLAR DISORDER AND BIPOLAR DISORDER CO-OCCURRING WITH ANXIETY DISORDERS

BY BENJAMIN LEE WATROUS



INTRODUCTION

The prevalence and epidemiology of Bipolar Disorder (BD) and Anxiety Disorders (AD) have been well documented. It is also apparent that there are high rates of comorbidity between these disorders, so that individuals with BD often times are also diagnosed with AD. Research has demonstrated that when these two disorders occur together, there is also increased impairment in functioning including insufficient treatment response, non-recovery, poor function outcome, and suicidality. However, the cognitive functioning of subjects diagnosed with comorbid BD and AD has been studied to a much lesser degree even though there is evidence of cognitive deficit when these disorders occur in isolation (McIntyre & Keck, 2006). Thus one could hypothesize that when these disorders occur together, a greater degree of cognitive impairment would be present than when they occur alone. The purpose of this study is to examine the potential neurocognitive deficits in subjects with the co-occurrence of Bipolar Disorders and Anxiety Disorders. The scope of this study, in analyzing the neuropsychological deficits of individuals diagnosed with BD and individuals diagnosed with BD comorbid with AD, may provide us with more information about these clues on a behavioral level, by comparing cognitive abilities and impairments between these groups.

LITERATURE REVIEW

BIPOLAR DISORDER

Bipolar disorder is a severe and debilitating mental illness that is characterized by dramatic fluctuation in mood, typically from states of deep depression to states of elations and mania. It has been reported that bipolar disorder is the sixth greatest cause of disability in the world (El-Mallakh et al., 2008). More specifically, BD was ranked seventh amongst worldwide causes of non-fatal disease burdens as measured in the disability-adjusted life years (DALY) (Martinez-Aran et al., 2007). Illness features of BD such as the number of episodes suffered, number of hospital admissions, and the duration of the illness were reported to have negative relationships with cognitive dysfunction according to a review performed by Robinson and Ferrier (2006).

ANXIETY DISORDER COMORBIDITY

The term 'comorbidity' first appeared in epidemiological literature in 1970 and refers to any distinct additional entity that has existed or that may occur during the clinical course of a patient who has the index disease under study. Comorbidities are separate disease entities with an identified pathogenetic process and etiology. Community and clinic studies have documented a high lifetime prevalence of comorbidity in BD. In a recent review McIntyre and Keck (2006) found that between 65% and 95% of

individuals with bipolar disorder met criteria for one or more additional DSM-IV diagnosis. Furthermore, 52.8% diagnosed BD subjects experience at least one AD in lifetime and 34.2% have a current AD (Fagiolini et al., 2007). The NCS reported that nearly all BD I subjects (86.7-92%) have a co-existing AD and 74.9% of BD patients of all types are comorbid with anxiety (El-Mallakh & Hollifield, 2008). In fact ADs may be the most prevalent psychiatric comorbidity amongst individuals with BD. Specific Anxiety Disorders range from Specific Phobias (SP), which is the most prevalent at 66.6%, to Panic Disorder (PD), the least prevalent, at 33.1%. Lifetime rates of Obsessive Compulsive Disorder (OCD) with BD were 21% compared to the OCD general population rate of 2%. (McIntyre et al., 2006) Other AD such as Post-traumatic Stress Disorder (PTSD) ranged from 16% to 39% of BD I patients while Generalized Anxiety Disorder (GAD) occurred in 29.6% of all BDs in the National Comorbidity Replication Study (El-Mallakh & Hollifield, 2008). Given these high rates of comorbidity, some have suggested that anxiety disorder in BD may represent a unique phenotype of the disorder.

Additionally, current studies have linked worse outcomes for individuals diagnosed with BDs when AD co-occur and mental health functioning appears to be worse for BD subjects with lifetime AD. AD comorbidity is significantly associated with: mixed episodes, prolonged depressive episodes, increased suicide risk, BD related health service utilization, associations with an earlier age of onset, poorer treatment response, increased global illness severity, increased functional impairment, fewer days well, lower likelihood of timely recovery from depression, risk of earlier relapse, lower quality of life, and diminished role function ((Goldstein & Levitt, 2008; Fagiolini et al., 2007; McIntyre et al., 2006; McIntyre & Keck, 2006; El-Mallakh & Hollifield, 2008)

Although AD comorbidity is very high, studies specifically examining this comorbidity group are few in number. In fact, AD comorbidity with BD is routinely used to exclude patients from clinical randomized trials (McIntyre & Keck, 2006). It is unclear if the reduced social and occupational functioning is an expression of the pathology of two independent disorders or an additive interaction of the coexisting disorders. Thus, evidently needed there are no well designed intervention studies in bipolar patients with comorbid anxiety (El-Mallakh & Hollifield, 2008) . However, it is clear that increase

research is warranted that specifically examines patients with BD and comorbid AD.

NEUROCOGNITIVE FUNCTION IN BIPOLAR DISORDERS

There is an emerging realization that BD is not only characterized by mood symptoms but also by neurocognitive deficits (Savitz, Solms, & Ramesar, 2005). In fact, it has been suggested that cognitive deficits may account for continued functional impairment after mood symptoms have resolved (El-Mallakh & Hollifield, 2008). Although, cognitive function has not been routinely examined in studies of psychosocial outcome in patients with BD because clinical variables have been thought to impact function more than cognition, it is now clear that some deficits (e.g., executive function) are present in manic, depressed, and euthymic patients. Thus, some neurocognitive deficits are independent of mood state, persisting even when mood symptoms have resolved (Martinez-Aran et al., 2007). This phenomenon further supports the notion that cognitive deficits are not a byproduct of the mood states.

Aspects of cognitive dysfunction in BD have been reported extensively in the scientific literature. A recent meta-analysis of cognitive deficits in euthymic patients with BD, performed by Robinson et al. (2006), has revealed marked impairment in executive function and verbal memory. In the domain of executive function, a large effect size was found in two aspects: category fluency and mental manipulation. Verbal learning also had a large effect size while aspects of immediate and delayed verbal memory, abstraction and set-shifting, sustained attention, response inhibition, and psychomotor speed had medium effect sizes. Small effect sizes for verbal fluency by letter, immediate memory, and sustained attention sensitivity were reported by Robinson. Cognitive deficits in euthymic BD were consistent cross-culturally, suggesting that these deficits relate to illness or treatment factors independently of cultural factors. Robinson et al surmised that it was not possible to conclude, on the strength of this evidence alone, that cognitive deficits in euthymic patients represent a trait marker of the illness. A couple of reasons are confounding residual mood symptoms and concurrent medications. Still, other sources have provided evidence that cognitive impairment is a trait marker of BD, due to the fact that cognitive deficits are evident at an early stage of the illness and in unaffected first degree relatives of BD patients who may share genetic vulnerability to the disorder (Robinson et al.,

2006). Neuropsychological deficits were also examined by Malhi and colleagues (2007), who attempted to determine the pattern of cognitive deficits and functional impact across all three phases of BD: bipolar depression, hypomania, and euthymia. Their results indicated that hypomanic and depressed BD1 patients displayed a modest impairment in executive functioning, memory and attention.

Although memory deficits in euthymic BD patients were non-significant when confounding variables were controlled for, bipolar depressed patients remained significantly impaired on tests of verbal recall. (Malhi et al., 2007) While attempting to determine if BD1 patients with psychosis have a distinct profile of cognitive deficits, Glahn et al found that BD1 patients presented preserved general intellectual functions, although moderate impairments of episodic memory and specific executive measures as well as moderate to severe deficits on attentional and processing speed tasks were also reported. In Glahn's study, BD1 patients were impaired in relation to healthy volunteers on 63% of the neuropsychological measures employed. Of the cognitive domains assessed in this study including processing speed, attention, executive functioning/working memory, verbal and declarative memory, 75% of remitted patients performed greater than one standard deviation below healthy subjects on at least four measures, whereas 25% performed more than two standard deviations below controls on four or more indices. Glahn's results pointed to a cognitive signature of moderate impairment on tests of episodic memory and specific executive measures. Moderate to severe deficits on attentional and processing speed tasks were also found, indicating that Bipolar illness disrupts multiple brain systems. They concluded that deficits in attention, psychomotor speed and memory appear to be part of the broader disease phenotype in BD (Glahn et al., 2007).

During the euthymic phase of BD, which is the time period within a BD episode where a person feels relatively normal having no manic or depressive moods, subtle impairments in attention and memory have been found (Malhi et al., 2007). Studies have also indicated that AD are associated with reliable impairments in episodic memory and executive functions among others, depending upon the specific disorder (Airaksinen, Larsson, & Forsell, 2005). These impairments which have been evidenced in separate BD and AD studies are reinforcement for the pursuit of a study examining cognitive

impairments of these disorders when they are co-occurring.

Attention and memory are crucial components of an individual's functional ability. Deficits in these abilities, which are usually taken for granted by normal people, can be a detriment to not only cognitive domains, but residually to social, emotional, and developmental aspects of an individual's behavior. For instance, if an individual is not able to remember certain aspects or procedures for his job description due to deficits of memory and attention, he will be incapable of performing at a competent level, potentially creating obstacles in other areas of his life.

Studies have proposed neurocognitive deficits as potential vulnerability markers or endophenotypes for the development of Bipolar I Disorder (BD1). BD is believed to have a strong genetic component, evidenced by twin, adoption, and family studies with heritability estimated around 80%. When researchers tested BD1 diagnosed subjects with their unaffected relatives for neurocognitive deficits, the unaffected relatives demonstrated an intermediate level of performance in comparison to normal control subjects (NC) and bipolar groups. More specifically, they found that after adjusting for mood symptoms, BD1 and unaffected relatives demonstrated significant deficits in comparison to NC in domains such as visuospatial/constructional, executive, and motor functions (Frantom, Allen, & Cross, 2008).

Other studies investigating the neuropsychological function in anxiety have demonstrated consistent findings that correspond to results found when examining the presence of comorbid AD with depression. When depressed patients were compared to depressed patients with AD, both groups showed worse memory function than NC, however the depressed with AD group had executive dysfunction and psychomotor slowing along with more impaired scores on a battery of neuropsychological tests (Basco, Ladd, Myers, & Tyler, 2007).

The impairments mentioned are important factors that are relevant when analyzed within the context of endophenotypes, which are described as the mediating process or marker between a genotype and a phenotype. These markers when associated with an illness in a population can be heritable, state independent, and both the marker and illness co-segregate within the family. The similarities between

deficits in neuropsychological domains may allude to clues about the genetic underpinnings of BD which currently remains undetermined due to its proposed complex polygenetic nature and demonstration of imperfect penetrance (Frantom et al., 2008).

NEUROCOGNITIVE DEFICITS IN ANXIETY DISORDERS

There have been relatively fewer studies examining cognitive impairments associated specifically with AD. Most of these studies involving cognitive deficits associated with AD utilized subjects with co-occurring primary diagnosis, particularly depressive disorders. Although executive dysfunction is evident in major depression, other more specific deficits appear to depend essentially on disorder characteristics (Castaneda, Tuulio-Henriksson, Marttunen, Suvisaari, & Lönnqvist, 2008). Basso et al compared nonpsychotic depressed patients with and without comorbid AD to controls on a brief but broad battery of neuropsychological tests. They found that depressed individuals with comorbid AD may be inclined to demonstrate greater neuropsychological dysfunction than those without AD. Both depressed groups showed worse memory functioning than controls; however executive dysfunction and psychomotor slowing were specific to the depressed with comorbid anxiety group which had more impaired scores than either the non-anxious depressed group or controls (Basso et al., 2007).

The depressed group without comorbid AD demonstrated no significant slowing compared to the control group, however depressed inpatients with comorbid AD displayed worse verbal fluency, compromised speed of visual scanning, cognitive flexibility and psychomotor speed (Basso et al., 2007). Given these findings, it is likely that the presence of a comorbid anxiety may serve as another moderating variable, and executive functioning deficits may be more commonly observed among the depressed with comorbid AD than those without the second diagnosis (Basso et al., 2007). Another study by Airaksinen et al, who specifically looked at AD rather than comparisons with depression, examined if inpatients diagnosed with AD presented neuropsychological impairments relative to healthy controls. In general AD are associated with episodic memory dysfunction and executive dysfunction, moreover the pattern of this impairment was similar for all anxiety subgroups (Airaksinen et al., 2005). However, the profile of cognitive dysfunction seems to depend on AD subtype (Castaneda et al., 2008). Prior

studies reported that PTSD, Phobia, PD and GAD were related to deficits in executive functioning, working memory and speed of information processing (Basso et al., 2007). PD was reported to be associated with deficits in: divided attention but not selective attention, short term verbal memory and learning, but not in visual memory, executive functioning or concentration, verbal long term memory impairment, visual memory and learning (Castaneda et al., 2008). PD with and without Agoraphobia (Ag) and OCD were related to impairments in both episodic memory and executive function, while SoP was associated with episodic memory dysfunction (Airaksinen et al., 2005).

SoP was reported to be associated with deficits in attention, executive and visuo-spatial functions and in short-term verbal memory and learning (Castaneda et al., 2008). OCD was reported to have deficits related to: executive functioning, long and short term visual memory, attention, processing speed and non-verbal memory (Castaneda et al., 2008). PTSD was associated with deficits in attention, short and long term verbal and visual memory, and executive functioning (Castaneda et al., 2008). Verbal fluency and psychomotor speed were not affected by anxiety, while Specific Phobias (SP) and GAD did not affect neuropsychological functioning (Airaksinen et al., 2005). The ability to utilize semantic cues was intact and a gain from free to cued recall was of equal size between anxiety subgroups and controls which suggests that episodic memory impairment is primarily related to encoding rather than retrieval problems (Airaksinen et al., 2005). According to Castaneda et al., some cognitive deficits appear to be evident in PD, PTSD, and SoP, but this evidence comes from a small number of published studies (Castaneda et al., 2008). Thus, one must be critical when considering the validity and reliability of the proposition that AD are associated with cognitive impairments.

NEUROCOGNITIVE DEFICITS AS ENDOPHENOTYPES IN BP WITH COMORBID AD

The ubiquity of anxiety symptoms in BD challenges the assumption that BD and AD are neurobiologically distinct disorders (McIntyre et al., 2006). There is emerging awareness that BD is actually a family of related disorders that share common features of mood or affective variation, impulsivity, propensity towards substance abuse, and predisposition to other psychiatric conditions (El-Mallakh & Hollifield, 2008). Residual and intervening factors have been

hypothesized to account for some of these findings. The introduction of confounding variables into these studies, however, can have the reverse affect by questioning the validity of the proposed findings. Investigations into neurocognitive function of BD are confounded by several factors: use of medications, presence of sub-syndromal symptoms, and the possibility of lasting neuroanatomical changes due to prior episodes (Robinson & Ferrier, 2006). Investigation of healthy individuals at high risk of developing BD avoids these confounds and sheds light on whether this aspect of the disease phenotype is shared by those at genetic risk of the disorder. (Robinson & Ferrier, 2006). First degree relatives (FDR) of individuals diagnosed with BD are at a high risk of developing a mood disorder; offspring of BD diagnosed parents are four times more likely to develop an affective disorder than offspring of healthy parents and FDR face a ten to twenty fold increase in risk for BD (Robinson & Ferrier, 2006).

Thus, studies with FDR are able to address if cognitive impairments are trait-like features independent of symptoms. For instance subtle signs of impairment in high genetic risk individuals for BD in components of verbal memory and executive function including planning, response inhibition, and mental manipulation have been documented (Robinson & Ferrier, 2006).

Consequently, verbal memory and executive function have also been proposed as potential cognitive endophenotypes; however the scarcity of studies on healthy first degree relatives may limit consideration of these cognitive domains as endophenotypes (Martinez-Aran et al., 2007). Frantom et al reported that deficits in verbal learning and memory, executive functions, and sustained attention have been considered as potential endophenotypes. They further investigated this phenomenon by comparing BD, FDR and control groups and found the following with respect to neurocognitive domains: for visuospatial constructional, BD and FDR groups performed significantly worse than normal controls; for visual learning and memory, BD and FDR groups performed significantly worse on 4

tasks and 3 tasks respectively in comparison to normal controls; for executive functioning, the BD group performed significantly worse than controls; in motor functioning, the normal control group performed better than the BD group (Frantom et al., 2008).

Finding the associations, patterns, and relationships between Bipolar and Anxiety disorders, if they can be discerned, will present a better understanding of the cognitive as well as the psychosocial aspects of individuals diagnosed with these disorders. Furthermore, the attempt of identifying common cognitive impairments or lack thereof, within particular cognitive domains may be useful in eventually establishing reliable cognitive markers for those individuals diagnosed with these disorders. The convergence of evidence that supports a genetic vulnerability in tandem with the potential findings of studies assessing cognitive abilities of Bipolar with anxiety may provide an insight into the identification of the endophenotypes involved. With a better understanding of the behavioral and physiological aspects, more affective diagnosis and treatment can be sought for individuals diagnosed with these affective disorders.

The following chart presents a summary of the previous cognitive deficits reported:

Table 1. Cognitive domain deficits reported in Bipolar and Anxiety Disorders

Disorder	Executive Functions	Verbal Learning	Attention	Memory
Bipolar Disorders	x	x	x	x
Bipolar 1 Disorder	x	x	x	x
Anxiety Disorders	x	x	x	x
Panic Disorder	x	x	x	x
Obsessive Compulsive Disorder	x		x	x
Post Traumatic Stress Disorder	x	x	x	x
Generalized Anxiety Disorder	x			
Social Phobia	x	x	x	x
Specific Phobia	x			

Legend: **X**=Deficit reported in previous studies.

In light of the reviewed literature, the following hypotheses are made regarding the cognitive deficits of individuals diagnosed with Bipolar disorders and Bipolar disorders comorbid with Anxiety disorders:

1) Participants with Anxiety comorbidity in Bipolar disorder will present an increase in cognitive deficit when compared to participants with Bipolar disorder.

der alone.

2) Participants with Anxiety comorbidity in Bipolar disorder will present an increase of cognitive deficits in executive functioning, verbal learning, memory and attention.

METHODOLOGY

PARTICIPANTS

Participants will include 20 individual diagnosed with bipolar disorder, 20 individuals with bipolar disorder and comorbid anxiety disorder, and 20 normal controls. They will be recruited from the community and from a southwestern university. Participants will be between the ages of 18 and 60. Individuals in the bipolar group will have a diagnosis of bipolar I or bipolar II disorder. Those in the comorbid anxiety group will have bipolar disorder I or II as well as a diagnosis of anxiety disorder, including generalized anxiety disorder, obsessive compulsive disorder, or another anxiety disorder. Individuals will be excluded from participation if English is not their primary language, they have a history of traumatic brain injury or any other medical or neurological condition that could affect CNS function, have a history of alcohol or substance abuse or dependence within the last six months, have a diagnosis of mental retardation, or are currently on prescription or over-the-counter medications that could produce significant cognitive effects, other than those medications used to treat bipolar disorder or anxiety disorder. Additionally individuals will be excluded from the normal control (NC) group if they have a lifetime diagnosis of Bipolar I disorder or a family history of severe and chronic mental illness, including bipolar I disorder or schizophrenia.

For all participants, the Structured Clinical Interview for DSM-IV (SCID) will be used to establish the diagnosis of Bipolar disorder, Anxiety Disorder, or to rule out lifetime diagnoses of DSM-IV Axis I disorders, and substance use disorders within the past six months. For compensation, UNLV participants received participation points for their course requirements. Other participants received monetary compensation for their participation. The local institutional review board for the protection of human subjects approved the study procedures. Prior to initiation of any study procedures, informed consent will be obtained from each participant.

MEASURES

All participants were administered a battery of

assessment procedures designed to assess background, demographic and clinical variables, diagnosis and symptoms, as well as neurocognitive functioning.

DIAGNOSTIC AND SYMPTOM MEASURES

The Structured Clinical Interview for DSM-IV. The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID; First et al., 1997) is a semi-structured interview for diagnoses of DSM-IV Axis I psychiatric disorders and was used to establish all psychiatric diagnoses in the current study.

Hamilton Depression Rating Scale. The HDRS (HDRS; Hamilton, 1960, 1967) is a commonly used symptom rating scale for the evaluation of depressed mood, vegetative and cognitive symptoms of depression, and comorbid anxiety symptoms.

Young Mania Scale. The Young Mania Scale (YMS; Young, Biggs, Ziegler, & Meyer, 1978) is a commonly used 11-item clinician administered rating scale to aid in the evaluation of mania symptom severity in individuals diagnosed with bipolar disorder.

NEUROCOGNITIVE MEASURES

The California Verbal Learning Test. The California Verbal Learning Test (CVLT; Delis, Kramer, Kaplan, & Ober, 1987) is a clinical instrument that was designed to measure the way in which auditory learning tasks are solved, (the processes involved in performance of the task, the different strategies utilized, the errors demonstrated by a participant, etc.).

The Biber Figure Learning Test- Expanded. The Biber Figure Learning Test- Expanded (BFLT-E; Glosser et al., 1989) is a test of recognition and recall of visuospatial stimuli in the form of geometric shapes.

The Wisconsin Card Sorting Test. The Wisconsin Card Sorting Test, (WCST; Heaton, Chelune, Talley, Kay, & Curtiss, 1993) which measures abstract concept formation and the ability to shift cognitive sets as feedback is given.

PROCEDURES

Information collected from participants in a study conducted at the University of Nevada, Las Vegas Neuropsychology Research Laboratory will be analyzed. The specific data of interest involves performance on neuropsychological assessments administered to participants diagnosed with Bipolar Affective Disorder and Bipolar Affective Disorder

with co-occurring Anxiety Disorders. The information from these groups will be compared, analyzed and reported.

Phone interviews were administered for potential participants' initial screening. Subsequently, participants found eligible for the study completed informed consent forms followed by further explanation of the information and their requirements as participants. Demographic and clinical interviews were initially administered followed by a diagnostic interview, symptom screening and neurocognitive measures. The same battery of neuropsychological tests was given to all participants at the UNLV Neuropsychology Laboratory. The administration of this battery lasted approximately 6 to 8 hours. Tests were administered individually in a quiet room by research assistant who were extensively trained to reliably and validly administer the instruments.

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THE EFFECT OF RETRO-LOCOMOTION ON FLEXIBILITY OF THE LOW BACK AND HAMSTRINGS

BY CHET R. WHITLEY



INTRODUCTION

Low back pain (LBP) is a serious epidemic in America, and it concerns everyone. According to data from the National Institutes of Health, back pain affects 80% of the nation's population (1). There are numerous treatments, from prescription medications to surgery, but all can be very costly offering inconsistent results. With such a large number of people suffering from this ailment, an innovative, simple, and cost effective treatment method is greatly needed.

America is negatively affected by LBP in various manners which is why it is important to discover a solution. One negative impact on society is that four fifths of our population is in gut wrenching pain that may proceed for weeks, or for some, months to years (2). It is also costly, accounting for increases in health care expenses, such as spinal surgery or prescription medications. Salary loss due to days lost from work and the need for workers' compensation due to this illness has an adverse economic impact. By discovering a way to minimize the number of people affected by LBP, it is possible to remedy substantial harmful impact on the quality of life, use of health care resources, and negative impacts on the nation's economy LBP causes.

Stiffness and immobility of muscles, ligaments, and tendons in the back, legs, and around the spine are

a common cause of LBP. Stretching is thought to improve recovery from stiffness. Those with ongoing back pain find stretching to mobilize the spine and soft tissues leads to relief of back pain following the increase in motion. The hips and gluteal muscles support the lower back and stretching these muscle groups plays a pivotal role in maintaining spine flexibility. Also, tightness in the hamstring limits motion in the pelvis which can increase stress across the low back and alter correct posture. Stretching the hips, low back, and hamstrings can gradually lengthen muscles and reduce the stress felt in the low back.

Researchers have suggested that walking or running in a backward direction, termed retro locomotion, stretches the hamstrings during the stride (3). This novel exercise may increase the flexibility of the hamstrings and low back, and allow an increase in mobility of soft tissue structures. Knowing that stretching and mobility of the low back and its contiguous structures decrease pain allows one to speculate that an exercise such as retro-walking could alleviate pain. Therefore, the purpose of the study was to explore whether a novel exercise intervention such as retro locomotion, can be an effective means to increase flexibility of the low back and hamstrings, ultimately decreasing LBP.

LITERATURE REVIEW

SCOPE OF THE PROBLEM

LBP has a lifetime prevalence of nearly 80% and is the fifth most common reason for physician visits in the United States (1). LBP has had a major impact on society due to its frequency. Astonishingly, 60–80% of the population will at some time exhibit pain of the low back (2). LBP is extremely common and will affect most adults at some time in their lives. This statistic is even more horrific when research shows that a reoccurrence of new episodes are twice as common in people with a history of LBP (1).

The first visit to a doctor's office is critical in diagnosing LBP. The history and physical examination allows the physician to place the patient into one of three categories, nonspecific low back pain, back pain associated with radiculopathy or spinal stenosis, or back pain associated with a specific systemic or spinal cause (3). Looking for red flags such as sensory loss, muscle weakness, limited range of motion in legs and feet, and excruciating pain indicate to clinicians what category a patient should fall into.

The method for classifying LBP is by duration. Pain in the low back lasting four weeks or less is considered acute. Acute back pain is the most common type, but usually resolves with self care. Most episodes of LBP settle after a couple of weeks, but many have a recurrent course, with further acute episodes affecting 20–44% of patients within one year in the working population and lifetime recurrences of up to 85% (4). Pain in the low back for a short period of time is described as a very sharp pain or dull ache. Acute pain can be intermittent, but is usually constant, only ranging in severity.

Pain in the low back lasting four to twelve weeks is considered subacute, while pain in the low back lasting longer than twelve weeks is categorized as chronic. Subacute back pain more than likely requires clinical intervention. Frequently, LBP never fully resolves, and patients experience exacerbations of chronic LBP. An estimated 15–20% of patients develop protracted pain, and approximately 2–8% have chronic pain (5). Chronic back pain is frequently described as deep, aching, dull, or burning pain in one area of the back. Numbness, tingling, or pins and needles type feeling in the legs are also sensations patients might experience. Chronic back pain is illusive in origin because it may result from

a previous injury that has healed, or an ongoing cause.

One may feel as if back pain is becoming evermore occurring, but that is not the case, it has been a common feature of human life. There has been no evidence within the past fifty years that back pain prevalence has increased (6). LBP is most prevalent in industrialized societies. Even though the incidence of LBP declines when degenerative changes of the spine occur (old age), it peaks at middle age. LBP affects men a little more than women and is most frequent in the working population, with the highest incidence seen in those aged 25–64 years. Women report low-back symptoms more often than men in those older than 60 years (7).

The usual course of LBP is rapid improvement, but 5–10% of patients develop persistent back symptoms. All in all, about one-half of adults experience LBP during any given year and about two-thirds have LBP at some time in their lives. Available data suggest that approximately 15% of US adults report frequent back pain or pain lasting more than 2 weeks annually, and more persistent pain, lasting beyond 3–6 months, occurred in only 5–10% of patients with back pain (7). More than 26 million Americans aged 20–64 years and almost 6 million aged 65 years and older have frequent LBP, concluding that musculoskeletal disorders are among the most frequently occurring conditions affecting the US population (8).

EFFECTS ON SOCIETY

LBP is a major health and socioeconomic problem. It is very costly, accounting for a large and increasing proportion of health care expenditures without evidence of corresponding improvements in outcomes (2). Due to the fact that no solitary treatment seems to work, scientists continue to search for biomedical solutions to this crisis such as new drugs, innovative surgical methods, technology, and even novel exercises. All of these methods are necessary because no single one of these medical advances seem to solve this terrible problem costing America billions.

LBP is second only to the common cold as a cause of lost work time; it is the fifth most frequent cause for hospitalization and the third most common reason to undergo a surgical procedure (9). This musculoskeletal complaint is a major cause of absence because of sickness in developed countries

and is the most common medical cause of long-term absence, accounting for more than half of all sickness absences lasting longer than two weeks (10). A promising statistic shows that employees who take sick leave return to work after one month and suggests that the corresponding return-to-work rate in United States is 81% (11).

Although most people appear to recover quickly from an episode of LBP, disability resulting from back pain is more common than any other cause of activity limitation in adults aged less than 45 years and second only to arthritis in people aged 45 to 65 years (1). Every year, 3-4% of the population is temporarily disabled, and 1% of the working-age population is disabled totally and permanently because of LBP. About 2% of American workers have compensable back injuries each year producing a staggering 500,000 cases of work-related spinal injuries. LBP accounts for 19% of all Workers' Compensation claims in the United States (10).

Back pain and disability have become a national epidemic demanding huge health care costs. An overlooked expense, indirect costs, takes into account production losses to industry and injury impact on insurance costs. Estimates of the indirect costs vary depending on the correlation relationships used. Annual back pain direct costs have been estimated for the United States as \$24.3 million (12). The direct costs to the health care systems and indirect costs to the industry do not include non-financial costs to the patient nor the family. The lack of participation in social, family, and domestic activities is a cost that is unattainable; it is priceless.

EFFECTS FOR INDIVIDUALS

Quality of life is a subjective and objective view of one's well being. In quality of life research, one often distinguishes between the subjective and objective quality of life. Subjective quality of life is about feeling good and being satisfied with things in general. Objective quality of life is about fulfilling the societal and cultural demands for material wealth, social status and physical well-being (13). LBP changes the lifestyles of Americans in many ways. The impact of musculoskeletal disorders affects an individual's physical being, or ability to physically get around. In the US, for people aged 45 years or less, LBP is the most frequent cause of activity limitation (14). Also, the psychological being, or being worry or stress free is disturbed and has powerful effects on subsequent functional disability (15). One third of patients report

persistent back pain of at least moderate intensity one year after an acute episode; one fifth report substantial limitations in activity (16). As LBP continues to be a pervasive disorder, so does physical inactivity, decreasing role activities, and the downfall of society's general mental health and emotional problems.

ANATOMICAL CONSIDERATIONS

There are various causes of LBP, but the key to understanding these causes is to understand the anatomy of the tissues of this area. The normal structure of the low back includes the lumbar spine (vertebrae), facet joints, discs between the vertebrae, ligaments around the spine and discs, spinal cord and nerves, muscles of the low back, internal organs of the pelvis and abdomen, and the skin covering the lumbar area. All of these important structures can be related to symptoms causing pain in the low back. For a region of the lumbar spine to be a source of pain it must be innervated by nerve fibers that transmit the message of pain.

The facets are small bony knobs that meet between each vertebra to form the facet joints that join the vertebrae together. There are two facet joints between each pair of vertebra, one on each side of the spine. They extend and overlap each other to form a joint between the neighboring vertebra facet joints. The oblique orientation of the facets contributes to many spinal functions, such as resistance to intervertebral shear forces, compressive forces, and intervertebral torsion (17). The alignment of the facet joints of the lumbar spine allows freedom of movement as one bends forward and back. Without the facet joints, there would be no flexibility in the spine, allowing movement in very straight and stiff motions.

Facet joints have been mentioned in the medical literature as a source of low back and lower extremity pain since 1911 (18). Facet interventions represent the second most common type of procedure performed in pain management centers throughout the US (19). Pain can be definitively attributed to these joints because the facet joint capsule and surrounding structures are richly filled with nociceptors that fire when the capsule is stretched or subjected to local compressive forces (20). The presence of nociceptive nerve fibers in the various tissue structures of facet joints and the presence of autonomic nerves suggest that these structures may cause pain under increased or abnormal loads. These joints abundantly supplied with nerves appear to be the source

of pain in 8-22% of chronic back pain sufferers, according to various studies (21). To further illustrate that facet joints are a source of LBP, in both pain patients and volunteers, chemical or mechanical stimulation of the facet joints and their nerve supply has been shown to elicit back and/or leg pain (22).

DISC COMPRESSION

The lumbar disc is the soft tissue between the vertebrae that acts as a cushion and allows for bending, twisting, flexibility and rotational torque between the upper and lower body. The discs also help to minimize the impact of stress on the spinal column. Each disc is designed like a jelly donut with a central softer component known as the nucleus pulposus and a surrounding outer ring known as the annulus fibrosus. When compressive force is applied to the disc, it squeezes the nucleus to the rear and can put enormous pressure on the annulus fibers. If that stress is allowed to concentrate on a small region over an extended period, the micro-trauma will cause the stressed annulus fibers to fail, resulting in rupturing or a herniated disc. Disc herniation can directly press on the spinal cord and/or adjacent nerve tissues causing pain which radiates outward from the spine in the distribution of the affected nerve. When the disc herniation is in the spine of the low back, it can cause a radiating pain down the legs, commonly referred to as sciatica. Local anesthetic blocks of either the facet joints themselves or the medial branches innervating them have been shown to relieve pain in a substantial percentage of patients with chronic LBP, furthering the theory that some form of failure of the intervertebral disc is central to causation of LBP (23). Effects of increased flexibility on LBP

Many sports-medicine experts believe that inflexibility of the lumbar spine increases the risk of LBP and injury in athletes (24). It is logical to believe that inflexibility could increase the stresses placed on the muscles, tendons, and ligaments of the low back during activity and thus damage those tissues or produce enough fatigue in the tissues so that the structures they protect, including the spinal bones and nerves, might be at increased risk of harm. Flexibility is a combination of joint range of motion and muscle flexibility. It can be calculated with range of motion or muscle flexibility measures (25). Reduced flexibility of the spine is often associated with LBP and sciatica (25). Decreased spinal flexion, extension, rotation and lateral flexion have been

reported among LBP patients (25).

It has been theorized that exercise may reduce back pain through a process of neurological or physiologic desensitization of the pain producing tissue, through the repeated application of force or stress to that tissue (26). Exercise has been promoted with increasing enthusiasm for the treatment of back pain. This has prompted a systematic review of the evidence concerning the effectiveness of exercise, with the conclusion that exercise may be helpful for patients with chronic LBP in terms of return to normal activities and work (27). One of the main goals of therapeutic exercise in low back disorders is to maintain and promote normal flexibility and achieve adequate flexibility and spinal range of motion (28). From a pathophysiological point of view this is important because the healing process of new collagen, and the elongation of connective tissues, require a normal range of motion (29). Also, by lengthening and stretching the lumbar spine, it decreases compression of the joints and causes an alteration in the tilt of the pelvis which has been suggested to influence hamstring flexibility.

It has been claimed that hamstring tightness is related to traction on the cauda equina or irritation of the nerve roots supplying the hamstrings (30). The mechanism that produces the hamstring spasm is not well understood, but hamstring tightness may certainly accompany a lesion of the spinal nerve roots causing LBP (31). The hamstring muscles are innervated by L4-S3 spinal nerves and their motor fibers are very sensitive to traction (32). Studies have shown that inflexible hamstring muscles limit anterior pelvic tilt during trunk flexion, thus influencing lumbar angle (33). If anterior tilt of the pelvis is limited, lumbar muscle and ligament tension increase, resulting in considerably greater compressive stress on the lumbar spine (34).

RETRO LOCOMOTION

Previously, few definitive benefits were concluded about retro locomotion, but this novel task was still implemented by a small segment of society. Coaches and athletic trainers claim to have used backward running drills to increase the athlete's coordination and endurance. Backwards walking has also been used to assess or improve the motor control of hemiplegic patients (35). Retro locomotion is increasingly becoming more widespread. Its new popularity could possibly be due to literature published showing retro locomotion as a means to

improve muscular balance, increase forward running performance, rest injured muscles, and prevent boredom (36).

Retro locomotion may seem like a simple reverse from traditional forward walking, but backward locomotion shows significant differentiations from its forward counterpart. For example, muscle activation patterns between forward and backward walking vary distinctly (37). Backwards walking produces more muscle activity in proportion to effort than forward walking (38). Research has demonstrated that the energy cost of backward walking is greater than that of forward walking (39). Also, the maximum quantity of oxygen which the body can take during maximum effort of walking or running backward at a given speed has been reported to be significantly greater than the metabolic cost of walking or running forward at the same speed (40).

Retro locomotion has been reported to increase cadence and decrease stride length when compared with forward walking. Changes in cadence and stride length lead to changes in joint kinematics. Joint kinematics involved in backward walking is substantially different from forward walking (37). There is a key difference seen in range of motion at the hip joint and this may be advantageous. During backward walking, the hamstrings are stretched prior to activation in thigh reversal and contact due to greater hip flexion and lesser extension. This pre-stretch supports the idea that hamstring flexibility is increased as well as an increase in low back flexibility positing to be helpful in both rehabilitation and training scenarios (3). Though forward and backward walking are somewhat different, from a biomechanical and anatomical perspective, both modes of locomotion must cope with postural and balance tasks, and both must provide propulsion and absorption power from the lower limbs (41).

METHODOLOGY

SUBJECTS

Three healthy adults (34.7 +/- 11.7 yrs; 165.9 +/- 5.3 cm; 73.8 +/- 34.3 kg) neither presenting without LBP nor experiencing LBP within the past four months volunteered to participate. Persons with acute lower extremity injuries or abnormalities (including leg length differences >2 cm, as measured non-invasively with a tape measure), or who have undergone back surgery or hip arthroplasty along with pregnant women were excused from participation. All subjects provided written consent in accordance with

policies established for the Protection of Human Subjects at the affiliated university prior to participation.

PROCEDURES

Data were collected from all study subjects throughout a four week retro-walking exercise intervention. Specifically, data were obtained each week in five sessions: pre and at the end of each week of the intervention (five tests total). For the data collection sessions, participants began with a 2-5 minute warm up walking forward at a personally comfortable velocity. The subject then performed a YMCA Sit-and-Reach Test to measure low back and hamstring flexibility (42). Three trials were performed and the greatest measure was used for analysis. A biaxial electrogoniometer (Biometrics, model SG 150) was secured externally to the low back vertically spanning T12-S2. Following warm-up, participants then walked backward on the treadmill at their preferred velocity for 10-15 minutes. Velocity was established by communicating with the subject if the treadmill pace was comfortable and if it was feasible for them to keep this velocity for the entire data collection period. Low back motion data from the electrogoniometer (1000 Hz) was obtained during 20 sec of the sixth minute of the walk. This process constituted the pre-test.

INTERVENTION

Following the pre-test, participants completed four weeks of backward walking on a treadmill or over ground for 10-15 minutes/day, four days/week, at the participant's chosen velocity. All laboratory tests were performed following the same procedures as the pre-test with velocity established in the same fashion as during the pre-test.

DATA ANALYSIS

Dependent variables (DVs) included retro locomotion velocity (RV), YMCA Sit-and-Reach Test score (SR), sagittal range of motion (sROM) of the low back and lateral bending range of motion (lROM) of the low back. Low back motion data (sROM & lROM) were obtained for each subject by taking the average value across ten successive foot strikes.

One-way five-factor (time) analysis of variance (ANOVAs) were computed for each DV ($\alpha = 0.05$). As appropriate, post hoc comparisons were conducted to determine the source of any observed differences.

CONCLUSION

Preliminary data (3 subjects) have been obtained (Figures 1-4). I will continue to obtain data from additional study participants in order to increase sample size. This will allow me to complete the statistical analysis as outlined in the Methods section.

Figure 1. Preliminary Retro Locomotion Velocity Data

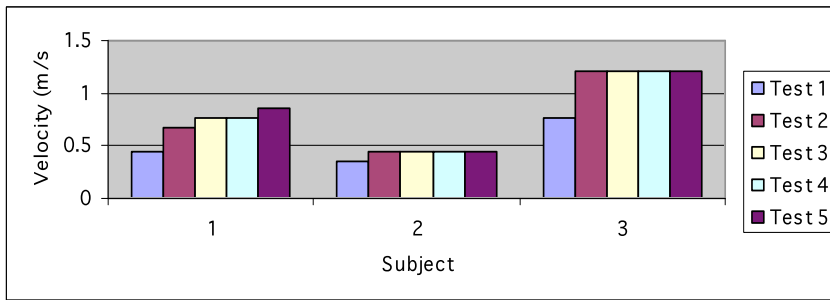


Figure 2. Preliminary YMCA Sit-and-Reach (SR) Data

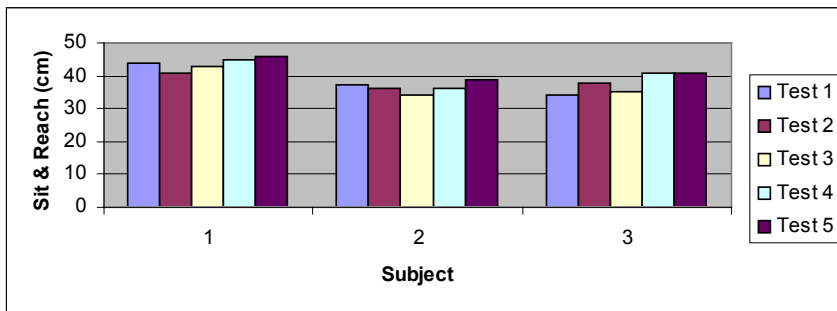


Figure 3. Preliminary Low Back sROM Data

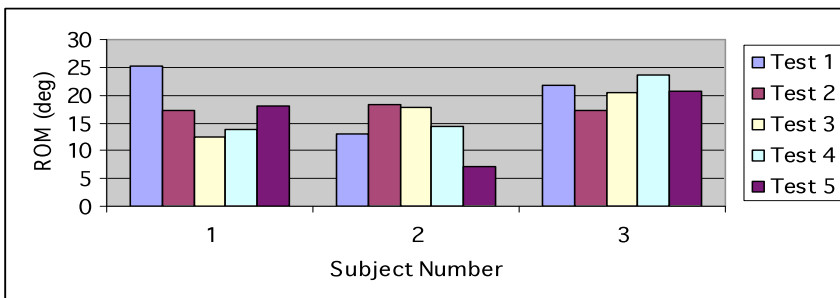
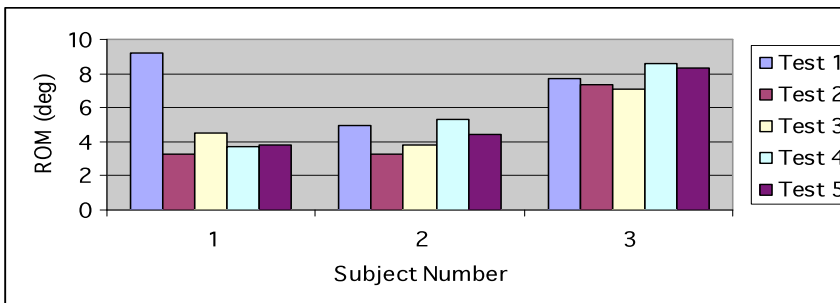


Figure 4. Preliminary Low Back lROM Data



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