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*Principal Investigator*

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*Director*

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*Academic/Research Coordinator*

ANGELICA OCHOA
*Administrative Coordinator*

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KELECHI UWAEZUOKE
BARBARA WILLARD

*Editor*
NISHA GURBUXANI
ACKNOWLEDGMENTS

WE ARE DEEPLY GREATFUL TO THE FOLLOWING PERSONS FOR THEIR SUPPORT:

ARNE DUNCAN
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Interim Associate Vice President Enrollment and Academic Services
A MESSAGE FROM THE DIRECTOR

The San Jose State University McNair Scholars Program is pleased to present the fifth SJSU McNair Scholars Research Journal. This journal represents the diverse and practical research experiences of the McNair Scholars during the 2007-2008 academic year.

I would like to congratulate the scholars for their hard work, dedication, and accomplishments in the summer research program. My sincere appreciation to the faculty mentors for their guidance, time, and commitment to the scholars, their research and the program. A particular word of thanks goes out to the families and extended support systems that made these outstanding presentations possible.

A special thanks to Colleen Brown, Interim AVP for Enrollment Services, President John Whitmore and Provost Carmen Sigler for their continuing support and encouragement given to both students and staff of this program.
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**Biography**

Abaynesh (Abby) Berhane is a Senior majoring in Psychology and Child and Adolescent Development. Currently, she is working full time while attending school full time. Also, she volunteers as a suicide crisis counselor at Valley Medical Hospital located in San Jose. She has always been passionate about researching the lives and psychological well-being of children and adolescents. She plans to receive her Ph.D. in Clinical Psychology or Child and Adolescent Development. Gratitude goes to all the people who have helped and supported her through the research process: Dr. Chancellor-Freeland, Dong, and Anthony among other volunteers. To my family and friends: Nisha, Jeannine, Marlon, Tedros and Esayas, thank you for pushing me and making me believe anything is possible. I love you all.

---

**Abaynesh (Abby) Berhane**

Major
Psychology and Child and Adolescent Development

Mentor
Dr. Cheryl Chancellor-Freeland

*The Role of Stress and Gender Differences on Creativity.*
The Role of Stress and Gender Differences on Creativity

ABSTRACT

Psychological stress is known to negatively affect numerous aspects of an individual’s well being (Honess & Marin, 2006). In recent years there has been mounting interest in researching how stress influences cognition and performance in the work setting (Forgas and George, 2001). Much of the research tends to support the view that positive mood promotes original thinking and business innovation; while negative affect would be expected to operate in an opposite manner (Forgas, 2000; Lyubomirsky, King & Diener, 2005). The purpose of this study was to experimentally test the role stress plays on creative thought. Our prediction was that stress would impair creativity because stress is known to induce negative mood states. Furthermore, because stress is known to impair memory more in women than in men (Wolf, Schommer, Hellhammer, McEwen and Kirschbaum, 2001), in contradiction we predicted that creative thought would be inhibited by stress more in men than in women. Participants for this study included 18 healthy undergraduates from a culturally diverse Northern California University, who were semi-randomly assigned to one of two experimental conditions. Participants were exposed to either a 10 minute speech and math test (i.e., Trier Social Stress Test) or the control condition (i.e., travel video). They were then tested for creativity using the Remote Associates Test (RAT). Salivary free cortisol levels were assessed for all participants at five time points before and during testing. Preliminary results from this study did not support our prediction that the stress group would perform worse on the creativity task. However, in terms of gender differences, males performed significantly worse in the stress relative to the control group, confirming our prediction that men would be more affected by the
stressor. Unexpectedly, we also observed enhanced creativity for women who were exposed to stress. We conclude that stress may facilitate creativity in women, but comparable levels of stress will inhibit creative thought in men.

Introduction

Researchers, academics, and clinicians have long sought to determine factors that affect cognitive performance. In the workplace, creativity is of particular interest. A number of studies have examined the role of stress and creativity, with much of the research in school settings (Rollins and Calder, 1975; Carlos and Grant, 2008). Non-scholarly based research has reported that in the work environment, stress fuels work performance, intensifies mental focus, and acts as a channel for creativity and innovation by inducing adrenaline (Sormaz and Tulgan, 2003). On the other hand, a growing body of research suggests that stress may inhibit creativity (Shanteau and Dino, 1993), focus (Mandler, 1979), and attention (Easterbrook, 1959). Similarly, Cushing’s disease patients who produce and secrete abnormally high levels of the stress hormone, cortisol, demonstrate cognitive performance deficits (Whelan, Schteingart, Starkman, and Smith, 1980; Starkman, Schteingart, and Schork, 1986). More specifically, stress and exogenously administered cortisol impair information processing and produce memory deficits in healthy adults (Kirschbaum, Wolf, May, Wippich, and Hellhammer, 1996). The question remains, does stress impair creative thoughts?
Stress

The original definition of stress by Hans Selye is “the non-specific response of the body to any demand for change”. During a response to a stressful event, the hypothalamus and pituitary gland of the brain, along with adrenal glands of the periphery, become activated. This response is referred to as the HPA axis response, and it results in the production and release of a cascade of neurochemicals, of which cortisol is secreted from the adrenal glands. The hormone is widely referred to as the “stress hormone” and it is reported to be detrimental to the learning and memory center of the brain. Recent research has suggested that the most profound type of stressor, and that which reliably induces high levels of cortisol, is the psychosocially-derived one, in other words, the stress which is produced by interpersonal interactions (Honess, & Marin, 2006).

The Trier Social Stress Test (TSST)

The Trier Social Stress Test (TSST) is a commonly used experimental psychosocial stressor, and one of the most effective means to elevate cortisol and to negatively affect memory. Kirschbaum, Wolf, Wippich, and Hellhammer (1996) examined two studies to investigate the connection between stress and memory. A total of 13 students participated in the TSST which included a public speaking task and an arithmetic task in front of an audience. In a second study, Kirschbaum et al. replicated the first study, but in this study, researchers randomly assigned 40 participants to a cortisol or a placebo receiving group. In both experiments, results were that cortisol levels were significantly elevated and memory was significantly impaired. Overall, Kirschbaum et al. concluded that elevations in cortisol impair the form of memory associated with declarative or factual information processing and/or retrieval. It should also be noted, however, that
other researchers who have examined the effect of 50mg hydrocortisone or placebo on memory recall found no significant differences between hydrocortisone and placebo conditions for word recall (Fehm-Wolfsdorf, Reutter, Zenz, Born and Fehm, 1993). Still, there is very little recent research that examines the role of stress on creativity.

**Creativity**

Originality plays a big role in creativity. Wilson, Guilford, and Christensen (1953) define creativity as the ability to develop original ideas. In their article, they measured the difficulty of developing a technique to measure individual differences in originality. The three measures they specifically looked at were the Uncommonness of Response, Remote Associate Test (RAT), and the Cleverness. The Uncommonness of Response measure defined originality as a continuum of uncommonness of response. In the Remote Association Test, originality was defined as the ability to make remote or indirect associations. In the third measure they examined, Cleverness, originality is defined as the ability to produce responses that are rated as clever by judges. Although the RAT measure did not produce the highest mean, it was found to be significant.

**Remote Associate Test (RAT)**

Remote-Association Test (RAT), measures for creativity. Mednick (1963) defines creativity as the combination of associative elements and that the more communality the words shared, the more creative the solution. Mednick measured the validity of RAT on graduate students. She compared the RAT measure with the Creativity Rating Scare (CRS). In this test, participants were presented with three words (a triad) and were instructed to come up with a fourth word that is associated with all
three words. For example, if presented with the words broken, clear, and eye, the correct answer would be glass (broken glass, clear glass, and eye glass). She found that the only significant correlation was found for the RAT ($r = .55, p < .005$). This finding supports why RAT would be more appropriate to measure creativity.

One of the most common measures used to test for creativity is the RAT (Mednick and Mednick, 1967). Mednick and Mednick suggested a positive relationship between RAT scores and creativity in job performance, Andrews, (1975) exposed that RAT scores predicted creativity only in environments that fostered innovation and creativity (e.g., encouraging and allowing for ingenuity, independence, and professional security). Previous researchers agree that situational stress and creativity present contradictory results. Taylor (1956) explains that in academia, anxiety is linked to task difficulties; this explains that the more difficult the task, the more anxiety students experience. Carlos and Grant (2008) hypothesize that stress affects men and women differently. In this regard, when adolescent boys and girls were exposed to equal levels of stress, boys had a significantly higher stress level compared to girls in the stress exposure group. In another study examining gender differences to stress plus its effect on memory performance, Wolf, Schommer, Hellhammer, McEwen, and Kirschbaum (2001) found a significant negative correlation between cortisol and memory for men only, such that the larger the increase in cortisol, the less number of words were correctly recalled by men. More recent, Murdock and Gamin (1993), and Ziv (1988, 1983) studied the relationship between humor and creativity. The connection between humor and leadership quality has caught little interest to researchers. Until recently, Sala (2000) studied the association between executive’s impulsive use of humor during an open-ended interview and
managerial effectiveness. Sala found that overall humor is significantly related to complex cognitive thinking. Findings for gender differences were positively supported; overall females used more humor than males. This implies that outstanding executives use humor to remedy stress.

The effect of stress on creative thinking is a fairly new topic and has not been well researched. This is a particularly important topic because it can facilitate success in various domains of one’s life, such as in one’s academic and professional life. The effect of stress on creativity is important because it is part of our daily life and therefore the purpose of our research is to examine the effects of an experimentally induced psychosocial stressor (i.e., TSST) on creativity. We predicted that stress would impair creativity because stress is known to induce negative mood states. To the best of this investigator’s knowledge, the role of stress and gender differences on creativity has not been investigated. However it has been well-documented that stress impairs cognitive performance more in men than in women (Wolf, Schommer, Hellhammer, McEwen, Kirschbaum, 2001; Kirschbaum, Wolf, May, Wippich, and Hellhammer, 1996; McDougall, 1998). Therefore, the secondary prediction for this research was that stress would impair creativity more in men than in women.

Method

Participants
Eighteen college students from San José State University (nine females and nine males) participated in this study and received extra credit or course participation credit. All participants were between the age of 18 and 21. In the stressful group the participants consisted of four African-American, four Asian Americans, one Latino, and three other. Although there were more participants in the stress group; participants in the control group
consisted of three Asian Americans, two Caucasians, and one other. Participants were told to abstain from the following activities at least one hour prior to the study: smoking, consuming large meals and acidic beverage, and arduous physical activities, behaviors that could alter the cortisol assay. Participants were semi-randomly assigned to one of two experimental conditions: stress or control. Assignments to each group were based on the time slot participants signed up for. Participants in the stress condition were exposed to a five minute speech plus a five minute mental arithmetic task (i.e., TSST); the control group watched a travel video for the same duration as was needed in the stress condition. In addition, both groups completed a creativity task (RAT). Two judges were always present for the TSST. To control gender bias and experimenter, experimenters were semi-gender balanced for both conditions.

**Instruments**

*The Remote Associate Test (RAT)*

The Remote-Association Test (Mednick and Mednick, 1967), measured for creativity. Participants were given 10 minutes to complete this task. They were instructed to read the instructions thoroughly before starting the task. They were presented with three words (a triad) and were instructed to come up with a fourth word that is associated with all three words. For example, if presented with the words cheese, sky and ocean, the correct answer would be blue (blue cheese, blue sky, blue ocean). Participants in this study were shown 65 very difficult triads.

*The Trier Social Stress Test (TSST)*

The Trier Social Stress Test (Kirschbaum, Pirke, and Hellhammer, 1993) is a moderate inducer of the stress response (i.e. moderate increase in cortisol level). The stress challenge
consists of 10 minutes of preparation for a five-minute mock job interview in which each participant attempt to convince a panel of two committee members, one of each gender, why he or she would be the perfect candidate for the job. In addition, a five-minute mental arithmetic task is also required of participants immediately after the mock job interview.

**Cortisol Enzyme Immunoassay (EIA)**

Saliva samples will be collected using the Salivette, a saliva collection device in which participants chew on a small cotton ball to absorb the saliva and stored in a small plastic vial for analyses (Catalogue # 51.1534, Sarstaedt, NC). Cortisol from the saliva samples will be measured via an enzyme-linked immunosorbent assay (ELISA) a technique that is able to detect and quantify salivary cortisol. The instructions for carrying out this assay will follow the protocol provided in the ELISA package for the measurement of salivary cortisol in humans (Catalogue # 1-3002, Salimetrics, State College, PA). Salivary cortisol was collected immediately before the stress or control condition, immediately after each stress or control condition, and the additional collections, one 10 minutes after each stress and control condition, and three every 15 minutes thereafter each stress and control condition for a total of five collections per participant.

**Design**

A 2X2 between factorial design was used in this study. The groups were male/female and control/stress. The Trier Social Stress Test (TSST) was used to experimentally induce stress. Elevation in cortisol production established TSST’s effectiveness in inducing stress. The independent variable was creativity. Participants also assessed for creativity using the Remote Association Test (RAT).
Procedure
Upon arrival, participants signed a consent form and an agreement to abstain from certain activities one hour prior to the study. Participants were introduced to the study by the experimenter and provided baseline samples for cortisol measurement. Upon being introduced to the judges, participants were asked to prepare a five minutes speech about their ideal job. After preparation, participants were taken to the judge’s room to deliver their speech. Immediately after the speech task, an arithmetic task was conducted in which they count backwards from 2083 subtracting 13 each time. Every time the participant made an error, the main judge asks the participant to start over from 2083. Throughout the TSST, participants were videotaped to measure speech performance. After this task, a sample of cortisol was collected. Following the sample collection, participants were instructed to complete a creativity task (RAT) followed by a fourth salvia sample collection. Last, a second questionnaire was collected followed by a fifth salvia sample.

Results/Conclusion
Overall, our first hypothesis was not supported because participants in the stress condition with a mean of 8.25 and a SD of ±3.7, performed better on the creativity task (RAT) than the participants in the control group with the mean of 7.33 and a SD of (+/-4.32) (See Table 1). In the stress group, there was a significant gender difference in creativity; females (M=9.83) were more creative than the males (M=6.67); which supported our second hypothesis. A significant difference was found between males and females when assessing creativity in the stress condition, t (12) = 1.48 p < .05.

Stressed was measured through saliva sample. Although
cortisol was measured in nmol/L when comparing the cortisol measured in three different points specifically following stress (TSST) and following the last questionnaire, data showed fluctuating concentration results (See Table 2). This may be explained due to different expectations and activities each individual performed prior to engaging in the experiment. Also differences in cognitive interpretations of the experiment should be taken into account. In addition, participants all had different cortisol baseline which might interfere with the data. Some individuals may naturally be more susceptible to high cortisol.

Males and females in the control condition and females in the stress condition showed decreasing cortisol concentration throughout all tasks (See Table 2). A decrease in cortisol concentration after performing the second task may be explained due to high anticipation participants experienced prior to starting the experiment. High anticipation may have caused participants to stress highly during the first task. After the first task participants may have felt more comfortable causing them to stress less. The increase in cortisol concentration throughout the experiment may be due to feelings of unease and discomfort. A bell shape result specifically an increase in cortisol concentration immediately after the TSST and decrease after the last task indicate a strong relationship between cortisol concentration and the effectiveness of the TSST. Males in the stress condition showed an increase in cortisol concentration after the TSST.

It is predicted that more and more college students are getting stressed in school and work settings compared to past decades. With more and more students working to pay for tuition, food, living, loans etc. students are performing the worst in the academic domain causing them to stress more. During stress, researchers agree that individual’s cortisol hormone level increases causing him or her to react uncomfortably. From this researcher’s
best understanding, under stressful situations, some people cannot think nor concentrate and can get easily frustrated. Using higher cognitive processing in academic or work related setting is effected either positively or negatively under stressful situations.

The effect of stress on creative thinking is a fairly new topic and has not been premeditated enough. It’s important to study the effect of stress on creativity because creativity is used in school, work, and any sport-related competition among other activities. By using the stress (TSST) and a creativity (RAT) measure, our research is trying to answer questions pertaining to the role of stress and gender differences on creativity.

In the current experiment, overall, participants in the stress group performed better on creativity than the participants in the control group. Specifically, females performed better in the stress group compared to the males. This may be explained due to the stigma people may have about gender differences and creativity. Females are more likely to conform to traditional gender role like washing dishes, doing laundry, and cooking meals at the same time especially in eastern world. The differences in creativity under stressful situations may also be explained through the biological differences. Stress affects women and men differently because of how they are biologically built. Human’s biological building blocks include the amount and different hormones that each gender produces (estrogen and testosterone). In the control condition, males performed better than the females on the creativity task. This may be explained through the universal belief that males resolve issues with calm emotional behavior; while women react based on emotion.

Creativity is defined differently based on gender. Males are more mechanically inclined than women because they are encouraged into those fields. Women are more creative in interior designs, fashion and other industries that women are encouraged to
Table 1
Mean of Creativity for Males and Females in the Control and Stress Condition.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Control</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>9.33</td>
<td>6.67</td>
</tr>
<tr>
<td>Female</td>
<td>5.33</td>
<td>9.03</td>
</tr>
<tr>
<td>SD</td>
<td>±.42</td>
<td>±3.70</td>
</tr>
<tr>
<td>Group Mean</td>
<td>7.33</td>
<td>8.25</td>
</tr>
</tbody>
</table>

Table 2
Mean (± SD) of Cortisol Concentration for Males and Females in the Control and Stress Condition.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Control</td>
<td>Stress</td>
</tr>
<tr>
<td>02</td>
<td>5.29 (±1.06)</td>
<td>5.90 (±3.52)</td>
</tr>
<tr>
<td>04</td>
<td>2.25 (±1.35)</td>
<td>9.23 (±7.61)</td>
</tr>
<tr>
<td>05</td>
<td>1.98 (±1.25)</td>
<td>3.16 (±2.83)</td>
</tr>
<tr>
<td>Group Mean</td>
<td>3.17 (±0.88)</td>
<td>6.10 (±4.39)</td>
</tr>
</tbody>
</table>
Future studies
Stress and gender differences play a role in creativity. Little investigation is completed on increased performance in creativity under stressful situations. Individuals may perform better under stressful situations because some researchers agree that adrenaline which induces stress may help individuals think and react faster. Future researchers should investigate stress and positive performance in creativity. Specifically, gender and cross-cultural differences in creative performance under stressful conditions should be investigated. Considering both genders produce estrogen and testosterone, another potential study to consider is if testosterone and estrogen levels play a role in stress and creativity in men and women.

References


<table>
<thead>
<tr>
<th>Biography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephanie Bowens is a Senior majoring in Health Science with a dual minor in African American Studies and Urban Planning. Currently, she works as a Peer Health Educator through the San Jose State Wellness &amp; Health Promotion Office. She is a member of Alpha Phi Omega Service Fraternity-Gamma Beta Chapter and Health Science Student Association (HS-USA). Her passion in health has manifested into a number of extracurricular activities and opportunities. She plans to receive her Ph.D. in Public Health with an emphasis in Built Environment and its impact on Chronic Health Conditions in Minority Communities.</td>
</tr>
</tbody>
</table>

**Stephanie L. Bowens**  
Major  
Health Science  
Minor  
African American Studies & Urban Planning  

**Mentor**  
**Dr. Kelechi Uwaezuoke**  

**Impact of Food Environments on Obesity Rates in Urban Areas: A Comparative Literature Review.**
Impact of Food Environments on Obesity Rates in Urban Areas: A Comparative Literature Review

ABSTRACT
The high prevalence of obesity in the U.S has become a priority public health issue. Although a number of factors influence one’s risk for obesity, numerous studies are showing a correlation between built food environments, especially fast-food and dining restaurants, and obesity rates. With the emphasis on time and being “on-the-go” in American culture, there is a great need for more policies addressing some of the issues with location, menu selections, and the marketing of food retail outlets in neighborhoods, particular in communities of color. Without addressing obesity from an environmental perspective, the steady increase of chronic conditions and excess deaths will continuously rise and further set back American’s health status. This paper reviews current literature on the correlation of obesity and retail food environments in urban neighborhoods, as well as suggested policy approaches to solving this public health issue.

Introduction
In today’s fast-paced society, eating healthy has become increasingly challenging. According to the National Restaurant Association (NRA), 48% of money spent towards food in the U.S. is spent in the restaurant industry. This increase in restaurant industry revenue has also come with the increase of a national epidemic: obesity. Increased eating-away-from-home foods has been associated with increased intake of calories, total fat, saturated fat, added sugars, and sodium, fewer fruits and vegetables, and less milk, fiber, and vitamins (Banwell, et. Al, Choi, et. Al., Falea, et. Al, Maddock, et. Al, Morland, et.al., Powel, et. al). All of these trends are known factors associated with
increased levels of obesity and ultimately chronic diseases such as diabetes, cardiovascular disease, and stroke (Banwell, et. Al, Choi, et. Al., Falea, et. Al, Maddock, et Al, Morland, et.al., Powel, et. al).

Over the last 30 years, obesity has become a public health crisis in the United States. The source of this crisis is rooted in part to the trend of Americans consuming more calories than they did 30 years ago. What has caused this great paradigm shift? The culprit lies partly in a shift in lifestyle and culture in America that caters to a living life “on the go” mentality. In addition to culture, the built environment (urban design factors, land use, and available public transportation) that promotes the use of accommodating amenities, such as fast-food plays a role in the increasing epidemic of “fast food” nations in urban neighborhoods (Booth, Pinkston, Walker, and Poston, 2005). Most significantly, the lack of interdisciplinary planning and policies that address public issues from a holistic point of view further promote the continuous increase of chronic conditions at epidemic levels.

This literature review focuses on seeking out current research on the impact the food environment, specifically away-from-home foods, has on the increase of obesity. In addition to reporting these findings on a national level, a more narrowed focused correlation will be done to an urban area of California, Solano County, which has significantly high rates of obesity, chronic disease, and numerous racial/ethnic health disparities. Lastly, the review also gives a current examination of policies addressing obesity and food environment, and how further evidence-based policy decisions must be made to help eradicate this national epidemic.
Methods
A snowball strategy was used to identify relevant research studies published between 2004 and 2008. Due to the multi-disciplinary nature of the topic, multiple databases were used, including: PubMed, EBSCOhost, JSTOR, and ScienceDirect. Key terms used included: obesity, food, diet, environment, built environment, food environment, fast-food, restaurant, urban, policy, public health policy, and SES (Socioeconomic Status). In addition to searching through databases, I used federal, state, and county websites to retrieve data on national, regional (state), and local (county/city) statistics and findings related to obesity and environment analysis. The output of the search criteria gave a high number of relevant articles (n=46). To narrow down which articles were most relevant to the topic, one of the three criteria had to be fulfilled:

1) Articles had to describe research that addressed neighborhood access to restaurants (not including other food retail outlets-grocery stores, supermarkets, liquor/convience stores, gas stations, etc)

2) Articles had to correlate evidence-based or statistical analysis of factors within the built environment and overweight, obesity, or BMI (Body Mass Index) status.

3) Articles gave current or future policy implications specifically related to addressing issues within restaurant menu offerings, nutritional information, advertisement/marketing, and location, targeted towards reducing obesity rates (national-local).

By using the criterion, the article relevance was reduced (n=20).
Background and Significance

Obesity: From the Nation to the State
Since the mid-seventies, the prevalence of overweight and obesity has increased sharply for both adults and children. (CDC: Obesity Trends, 2006). According to the United States Department of Health & Human Services (USDHHS), 61% of adults in the U.S are overweight or obese (BMI > 25) and 13% of children and 14% of adolescents aged 12 to 19 years old are overweight. People who are obese are at an increased risk for heart disease, high blood pressure, diabetes, arthritis-related disabilities, and some cancers. Obesity has not only affected people’s quality of life, but also the economy. The estimated total cost of obesity in the United States in 2000 was about $117 billion ($21.7 billion within California), which includes medical care cost, workers compensation, and lost productivity cost (Topline Report, 2007).

California has also been dramatically impacted by national trends concerning obesity and nutrition. California’s obesity rate has nearly doubled in the past 12 years, being 10.2% in 1991 and 19% in 2003 (CDC, 2002). More than half of all California adults are now obese or overweight (CDC, 2006). It is also noted that rates of obesity are highest and have risen the most rapidly among people of color and those in lower-socioeconomic communities in California (PolicyLink, 2008).

Furthermore, the impact of obesity rates in people of color is evident through the statistics of Solano County, one of the seven counties of the diverse San Francisco Bay Area. Solano County is composed of seven cities: Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo. The demographics of the county reflect that of California, with 70% of its estimated 2010 population as Non-White, leaving a great presence of African
American, Hispanic/Latino, American, Asian/Asian-Pacific Islander, and multi-racial population.

**Food Environment**
While there are a number of major determinants of overweight and obesity, particularly individual behavior, there is now a substantial amount of evidence showing the effect that community food environments has on obesity (Glanz, Resnicow, Hoy, Stewart, Lyons, & Goldberg, 2007).

The food environment can include availability and accessibility to food as well as food advertising and marketing (Lake & Townshend, 2006). Two food access pathways in relation to the food environment are: food for home consumption from supermarkets and grocery stores and out-of-home consumption environments from restaurants and take-aways (Lake & Townshend, 2006). The pathway that is becoming more popular in modern society is out-of-home foods.

Full-service restaurants, defined as establishments with wait staff, tend to offer more varied menus and dining amenities. Fast-food establishments tend to emphasize convenience and have specific menu genres (Stewart, Blisard, Bhuyan, Nayga, 2004). The expansion and popularity of these restaurants begin in the mid 1990’s, when fast-food sales began to surpass full-service restaurant sales and demand (Stewart, et. al., 2004). Strategic location of new fast food outlets, based on the major sales point of convenience became priority. Fast-food companies began to open more outlets per square mile so that consumers have to travel less for faster food, reinforcing the convenience. In addition, opening of other retail stores (Wal-Mart, Target, etc) have created more demand for fast-food, which is why there is a great deal of
“channel-blurring”, retail stores hosting foodservice chains (McDonalds, Taco Bell, Pizza Hut, Etc) (Stewart, et. al., 2004).

Findings
Over the last three decades, there has been a significant trend towards the consumption of “away from home” meals. According to the USDA (United States Department of Agriculture), about half of the American food dollar is spent eating out—with about 40% of that going to full-service restaurants and 40% to fast-food (Stewart, et. al, 2004). At least one-third of American adults and children eat at a fast food restaurant daily (Stewart, et. al, 2004). Greater consumption of away-from home foods has been associated with increased intake of calories, total fat, saturated fat, added sugars, and sodium, fewer fruits and vegetables, and less milk, fiber, and vitamins (Glanz, et. al, 2004). Furthermore, fast-food restaurant density and a higher ratio of fast-food to full-service restaurants were associated with higher individual-level weight status (Mehta & Chang, 2008). In addition to lacking nutrition, numerous chronic conditions and diseases are associated with away-from home diets, with perhaps the most damaging being obesity rates.

Obesity and Food Environment
With the growing demand of convenience and away-from home foods, has come the increase in obesity. Acute and morbid obesity are tremendously detrimental to your overall health and well-being. Excess weight is associated with the development of type 2 diabetes, cardiovascular disease, some types of cancer, and other chronic conditions (Glanz, et. al, 2007). Restaurant placement and location is highly correlated with risk for being overweight or obesity. In addition to location, menu presentation and advertising influences individual choice, and when misleading, can cause
individuals to make unwarranted decisions causing greater risk than expected.

**Location**

A number of cross-sectional and national studies reveal the availability of food sources and how this affects intake and obesity rates. A major characteristic of food retail location is based on neighborhood racial composition and socioeconomic status (SES). Morland, Wing, Diez Roux, and Poole (2004) found that compared to the poorest neighborhoods, a large number of supermarkets and gas stations with convenient stores are located in wealthier neighborhoods. However, low-income racially diverse neighborhoods that were four times more likely to have fast-food restaurants and less-likely to have supermarket or grocery stores. In addition, three national studies have reported a direct relationship with areas ranking lowest in obesity and having more residents per operating fast-food restaurant. An example from one study, which examined 28,000 U.S. ZIP codes found considerable disparities despite adjustments for population size, urbanization, and region. However, studies examining full-service restaurant availability and obesity reported no evidence of a relationship (Larson, Story, & Nelson, 2009). In urban areas, higher proportions of available fast-food restaurants out of total restaurants in predominantly black and/or racially mixed versus predominantly white neighborhoods may contribute to racial differences in obesity rates.

California’s availability and location of restaurants has also been correlated to its growing obesity epidemic. Data from a report released by the California Center for Public Health Advocacy, PolicyLink, and the University of California-Los Angeles (UCLA) Center for Health Policy Research, revealed that California has more than four times as many fast-food restaurants and
convenience stores as grocery stores and produce vendors. This suggests that California residents have increased access to foods with lower nutritional values, resulting in increased overweight and obesity rates. The study also revealed that lower-income, racially mixed neighborhoods had higher Retail Food Environment Indexes (RFEI), which is the total number of restaurants and convenience stores divided by supermarket and produce vendors (California Center for Public Health Advocacy, et. al, 2008).

Furthermore, Solano County had an even higher RFEI than the state average, having 5 times more fast-food and convenience outlets (California Center for Public Health Advocacy, et. al, 2008). In a study completed by the Solano County Public Health Nutrition program with the statewide Communities of Excellence in Nutrition, Physical Activity, and Obesity Prevention (CX3) (2008), four low-income neighborhoods in the county were evaluated for types of food retailers/stress, accessibility, promotion of healthy eating, and type of marketing presence (fast-food ads vs. 5-A-Day). Results revealed that 75% of the targeted neighborhoods did not meet standards for availability of quality nutritious foods.

Menu
In addition to the number and location of away-from-home food outlets, what is offered on the menu of each establishment is of great significance. Several factors influence what will be offered on the menu and whether it will stay. The base factor is consumer demand and pricing. In a national study done in the U.S, Glanz and others interviewed 41 senior menu development and marketing executives at leading casual dining and fast-food restaurants and found that growing sales and increasing profits are the most important consideration mentioned by 61% of respondents versus
health and nutrition, which were noted as important by only 21% (Glanz, et. al., 2007). Additionally, the study noted that some reasons for apprehension to offering healthy menu options include short shelf life, increased preparation time, low sales, and high labor cost (Glanz, et. al., 2007).

In addition to industry discrepancy in healthy menu offerings, there are also disparities in available healthy menu options in certain neighborhoods. Lewis, et. al (2005) examined availability and food options at restaurants in less affluent and more affluent areas of Los Angeles County to compare residents access to healthy meals prepared and purchased away from home. The results revealed that poorer neighborhoods with higher proportions of African American residents have fewer healthy options available, both in food selections and in food preparation (Lewis, Sloane, Mascimento, Diamant, Guinyard, Yancey, and Flynn, 2005). In addition, Powell, et. al found that in the observed 28, 050 ZIP codes low-income predominately black, Hispanic, or racially mixed versus predominately white neighborhoods had fewer available full-service versus fast-food restaurants. However, a northeastern-based study showed that fast-food restaurants have a greater healthy entrée and main-dish salad availability, but sit-down restaurants had a higher proportion of healthy main-dish salads and more healthy food and beverage items (Saelens, Glanz, Sallis, & Frank, 2007).

**Marketing**

In addition to price and availability, the marketing and advertisement of food choices also influences consumer choices. Studies have found that fast-food restaurants often encourage large portions, unhealthy eating, and overeating, and offer relative cost savings for combination meals and menu items that were less
nutritional (Saelens, et. al, 2007, Larson, et. al, 2009, Lewis, et. al, 2005). In the CX3 study completed in Solano County, Ca, results revealed a prominence of unhealthy marketing practices, as well as, lack of nutrition information and healthy fast food options, which could be correlated to the county and its 7th highest obesity rate in the state (2008).

Public Health Policy & Interventions
With the growing amount of studies and information on the correlation of the away-from home food environment and obesity rates, it is evident that food environments have a great deal of significance in the obesity epidemic nationally, and locally. There are many avenues that can be approached to resolve these issues, policy and urban planning being two of the many.

Public policy, from national to local, has always set the path for how society functions. Policies addressing obesity and food environments are relatively new to U.S. government agencies and offices, as the correlation has been recognized in just the past decade. Historically, national policy agendas tend to have “domino effect” results; once it has reached national recognition and then works its way down to even local city and regional policies. The presence of policies addressing the effects of built environment and obesity are indeed becoming more of an addressed issue in U.S. government.

Since 2001, when the U.S Surgeon General made his official “Call to Action to Prevent and Decrease Overweight and Obesity”, a number of national agencies have followed in suit. The United States Department of Health & Human Services has made obesity a top agenda for current and future health issues to resolve. In the Healthy 2010 report, obesity is noted as the 2nd most preventable cause of death, therefore making it a major priority. The U.S Food
and Drug Administration (FDA) released a report titled, “Keystone Forum on Away-From-Home Foods: Opportunities for Preventing Weight Gain and Obesity.” The report gives recommendations of what policies can be created to strengthen food labeling, including restaurant menus, ensuring food items accurately portray serving size, and general nutrition and weight management education (FDA, 2008). Unfortunately, even with the heightened attention on obesity and nutrition, and the tremendous amount of funding directed towards prevention and management, there has been no U.S laws or policies adapted to directly eradicating some of the harmful infrastructures that fuel the obesity epidemic. However, more states and local government offices are beginning to make efforts towards addressing the lack of policies to address the obesity rates in their region, California being one of the forerunners.

California is taking great strides in helping to further control and prevent the spread of obesity. Two major bills have been passed in California that relate to away-from-home foods and obesity. Assembly Bill 98, by Assembly member Tony Mendoza, will phase out the use of trans fats in all California restaurants beginning in 2010 and from all baked goods by 2011 (Office of the Governor, 2008). Senate Bill 1420, by Senator Alex Padilla, makes California the first state in the nation to have its restaurant chains with 20 or more locations statewide post calorie information on menus and indoor menu boards for consumers (Office of the Governor, 2008). These policies are great starting points for California progressing towards addressing issues amongst its food environment. In due time, the “domino effect” will reach regional and local areas with in California, and hopefully reach public health offices and city/regional planning policy initiators.
Due to the large-scale of this issue and the tremendous lacking in policies and laws, there have been a number of recommended theories towards effective policies addressing food environment and obesity. Some are as follows:

1) Obesity Policy Action framework: “upstream-economic, social, & physical”, “midstream-policy actions that directly influence behavior”, and “downstream-policy actions that support health services and clinical interventions” (Sacks, Swinburn, & Lawrence, 2008).

2) Public funds need to be invested in building an environment that provides the comfort of modern lives, but also makes healthier lifestyles a desirable and an easy choice (Choi, Hunter, Tsou, & Sainsbury, 2005).

3) Whereas energy-dense foods remain the most affordable option, it is recommendable that healthful foods of lower energy density be disproportionately increased. The government may need to make policy shifts that help people eat more healthful foods—such as changes in subsidies for agriculture (Tufts University, 2008).

4) Governments, in cooperation with other stakeholders (industry, nongovernmental organizations, etc.) play a central role in creating environments that empower and encourages making positive, life-enhancing behavior in terms of diet (R. Colagirui, S. Colagirui, Yach, & Pramming, 2006).

5) Have zoning laws that address fast-food outlets in several approaches:
   a. Banning fast-food outlets and/or drive-through service
   b. Banning “Formula” Restaurants
   c. Bans that apply to certain areas
d. Regulating the number of fast food outlets-quotas  
e. Regulating density of fast food outlets  
f. Regulating distances from other uses.

**Conclusion**

Eradicating a national epidemic such as obesity will take years of investigation and steady policy changes and implementation. Many of the studies involved in this review overlapped on a fairly new topic addressed in public health in relation to obesity: the built environment. Additionally, national and local analysis of built environments will be needed to assess the overall projection of communities food environments and how a change in this segment of society can assist in reducing obesity in the U.S. National. Moreover, surveys and cross-sectional studies will be essential in the assessment of all urban, suburban, and rural urban environments. Also, special attention should be drawn to the disparities in obesity rates in low-income and/or communities of color.

Historically, California has always been at the forefront of social changes. It is therefore of great importance to continue enacting policies that protect consumers from hidden and harmful health information in away-from-home food outlets. Future studies will be necessary to follow-up on the effects of the upcoming policies. More collaboration amongst healthcare workers, city/regional planners, and U.S government and policy will be essential in assuring that the U.S. has an environment that offers and keeps healthy dietary options available to all.
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Biography
John Duong was born and raised in San Jose, California. Having an interest in automobiles since he was little and a curiosity for robotics, he is currently a Junior studying Mechanical Engineering. His current research deals with the challenges that exist for cars that run on hydrogen gas. In addition to his studies and research, John is a member of Project Enable at San Jose State University where he and a team of students work together to design and prototype solutions for the less able (disabled). With a developing interest for biology, chemistry, and engineering; John will look into the field of bioengineering for his graduate studies and possibly a minor degree. At the same time, he hopes to be an exemplary role model for his brother who is a Freshman at SJSU. John’s goal is to find his most desirable career within the several interests he has and hopes to impact the world in a significant way.
The Promise of Hydrogen Vehicles: An Examination into the Current Problems and Developments (Concentration on Hydrogen Storage)

ABSTRACT

The year is 2009 and by now, some people are expecting to see flying cars. Although we may not see flying cars in our lifetime besides in the movie *Back to the Future*, alternative vehicles seem years or decades away from being a reality. With electric vehicles having their own problems, hydrogen vehicles are mainly faced with the challenges of producing hydrogen gas in an eco-friendly way and storing it for mobile applications. Researchers are looking into alternative energy such as wind and solar power that is generating things around the world, but there is still a need to research these sources before they are used effectively to produce hydrogen gas by electrolysis. Ideally, alternative energy would be the source to generating electricity, and applied in generating hydrogen gas from water that will power hydrogen vehicles. In addition to these challenges, storing hydrogen gas, which could be as safe as gasoline, is being researched to find the most efficient and cost effective method for such application. With further developments, hydrogen cars may become the next big thing, while flying cars may just be a fantasy for some time.
Introduction

Global warming and the dependency on foreign oil are two main reasons why alternative energy and alternative vehicles are being developed. The United States is currently the highest country that uses the most oil at 20.7 million barrels each day followed by China at 6.5 million (Haugen, 2006, p.13). The effects on the recent high gas prices has allowed many people to realize that we must lessen our dependency on oil. Developing alternative powered vehicles by alternative energy would allow our country to cut back on foreign oil and meet the global climate challenge. On a larger scale, it is important to limit the world’s ¼ of oil consumption for powering gasoline automobiles, since it will only be a matter of time until fossil fuels run out. In addition, we must find a better way to diverge ourselves into a different path for mobile transportations with gasoline.

As electric and hydrogen vehicles go into their current stage of prototyping, alternative energy developments need to continue to make these cars a reality. Although alternative energy such as wind and solar have promising results, additional research is needed to make them more cost effective and at least as efficient as current gasoline. One major concern with hydrogen vehicles are storing the hydrogen gas effectively and getting the efficiency of gasoline. However, areas of research such as nanotechnology that uses nanotubes to store hydrogen gas are still in developments. In addition, part of the concern with storing hydrogen gas is safety issues, but it was claimed that it could be as safe as gasoline in several ways. This examination will start with the three major ways that hydrogen can be stored with its own advantages and disadvantages.
From Alternative Energy to Electricity to Hydrogen Gas

Hydrogen and water exist within the universe in an abundant amount and they can be considered as renewable energy to a certain extent. While pure hydrogen is easily obtained from water by the usage of electricity, hydrogen does not exist in nature by itself due to its behavior. Currently, alternative energy is used throughout the world in generating the electricity needed to power homes and businesses. Similarly, the same alternative energy can generate the electricity needed to produce hydrogen gas from our most abundant resource—water [Figure 1].

[Figure 1]: Water is being isolated into two gas forms, oxygen and hydrogen, by electrolysis (a process that requires a current that passes into water).

Wind turbines, photovoltaic (PV), hydropower, and biomass are some types of alternative energy. However, the two most significant alternative energy that we heavily depend on are wind and solar power. With continue developments to wind and solar, hydrogen gas will depend on these sources to compete
against gasoline as a fuel to power vehicles. Wind turbines have played a major role in providing the world with some of the energy we highly depend on and it is the same generated electricity that could be used to produce hydrogen gas from water.

**Wind Turbines**

Geoffrey Holland and James Provenzano (2007) in *The Hydrogen Age: Empowering A Clean-Energy Future* talk about the world’s dependency on wind turbines which generate 74,000 megawatts. Ranking third in the world for producing the most electricity with wind turbines, the United States generates 12,000 megawatts. Current research about the availability and efficiency of wind as an energy provider was conducted by a professor at Stanford and a graduate student who took data on 7,500 surface stations and at 500 balloon launch sites. They found that some of the locations they studied had enough wind to generate an amount of power equaling 36,000 Hoover Dams at 72,000 terawatts. They concluded that the average wind speed at these locations were about 15 miles per hours. Due to wind efficiency and availability, the current cost of one kilowatt generated by wind is at four cents, thus making it one of the cheapest energy providers (p.134-136).

Holland and Provenzano (2007) also mentioned that there are times when there is no wind at all while electricity is in demand or vice versa. Load leveling is used to solve this problem, load leveling is a process that takes the electricity produced by the wind and converts it into something else (i.e. hydrogen gas) that can be reversed back during times like high peaks hours. Having electricity to power pumps which send water uphill to a reservoir is one method to convert the energy for later usage (flow of water can generate electricity). The other method is to have electricity produced by wind stored in a battery-like tank that usually consists
of vanadium compound. Beginning in 2008 at Sea Cow Pond in North Cape, people took a different approach to storing the extra electricity produced by wind turbines. The idea behind their load leveling was taking the electricity generated by the wind to produce electrolyzed hydrogen. North Cape will use the hydrogen produced from the generated electricity from wind turbines to fuel hydrogen buses and vehicles. According to Lester Brown, by the year 2020, Europe will produce enough electricity from wind turbines for half of its population (p.136-138). In addition, capturing sunlight for generating electricity has promising results for producing hydrogen gas as well.

**Solar Energy**

Robert Evans (2007) in *Fueling Our Future* talks about the different methods in using solar thermal energy to produce electricity. There are two main methods: solar heating in the form of either passive or active and photovoltaic (PV). Passive solar heating is the concept of collecting the heat generated by the sun to heat up building environments. The methodology can range from simple to complex. The simple way is having the larger windows of buildings facing the south side where the sun is present and has minimum windows on the opposing side (north) to trap the heat. This phenomena is similar to wearing dark color clothing, especially black, that absorb the sun and creates a hot sensation. There have been discussions about creating clothing that can absorb sunlight to power everyday gadgets such as cell phones or iPods. The more complex concept is to coat the wall of the buildings with black paint so the walls can absorb the heat. The air taken from the window gaps will then circulate the absorbed heat throughout the environment (p.83-84). On the other hand, Evans stated that active solar heating uses “solar collectors.” This concept is collecting the heat from the sun to boil a liquid, mainly
water, this in turn results in steam production that is used to power steam engines in generating electricity (p.83-84). Unlike passive solar heating that focus on buildings heating, active solar collectors are the ones that will produce the electricity needed to generate hydrogen gas from water.

Larger active solar collectors are currently in their conceptual phases. The first type is the “power tower” concept that has a massive surrounding of large mirrors acting as reflectors around a central control tower that has a “receiver.” The large mirrors have sensors that can track the sunlight and thus focus it toward the central tower “receiver” where it is heated. Afterwards, when the receiver is heated, the heat can be used to do two things: heat water or heat molten salt. Heating molten salt will allow a higher yield in the production of heat to heating the water. The heated water will then be used to generate steam that powers steam generators which produce electricity (more effective than heating water directly to get steam). This conceptual idea called “Solar Two” is currently implemented at Mojave Desert near Barstow. The other active solar collector is the solar “trough” concept also located in California. This concept is based on having large parabolic mirrors aligned together in the north to south axis that have a “hot oil heat transfer fluid piped,” which is aligned from east to west and passes right through the focal point of each dish. Once the hot oil gets heated, it is then applied to boiling water for generating the steam needed for the electricity generation (Evans, 2007, p.84-87).

The other form of solar thermal energy is called Photovoltaic (PV) which is the main area of focus for generating electricity from the sun. A PV mainly consists of two conducting plates, an insulator plate, and conducting wires. The top plate is
typically coated with an element like silicon that is doped, a process that adds or removes electrons with other elements, such as phosphorus. The photons (energy packets released from the sun) are absorbed by the top layer PV which excites the electrons on the plate. These electrons then flow through a circuit that will create a current (electricity). However, due to the low efficiency rate at which PV’s absorb photons, developments are ongoing to make this technology more cost effective.

Alternative energy, such as the two mentioned above, will have an impact on how competitive hydrogen gas vehicles are compared to gasoline vehicles. Using the electricity generated by alternative sources instead of fossil fuel would keep lower the cost for powering hydrogen vehicles. Another factor for hydrogen vehicles to compete with gasoline vehicles effectively is the miles traveled per fill-up. As of right now, 4 kg of hydrogen will provide a driving range of 240 miles (Romm, 2004), but researchers are exploring different methods to increase this number, and are examining different forms at which hydrogen gas can be stored in.

**Three Primary Storage Forms and the Disadvantages**

Hydrogen gas has a lower energy-to-volume ratio than gasoline. For this reason, it requires a larger storage space to get the comparable driving range of gasoline. One method in decreasing the volume of hydrogen gas is through pressure compression. The greatest concern of compressing high-pressure gas in a restraint container is the safety concerns (mention more about later). Joseph Romm (2004) in *The Hype About Hydrogen* researches hydrogen and transportation fuel during the Clinton Administration illustrates that there are three primary ways to store hydrogen gas in automotive tanks: liquid hydrogen, compressed hydrogen, and metal hydrides. Currently, automobile
manufactures are developing their prototype vehicles that use hydrogen gas in a compressed form.

Many automotive makers are currently considering compressed hydrogen gas for their hydrogen-powered vehicles. For example, the Honda FCX, which already uses compressed hydrogen gas as fuel, is the only hydrogen gas vehicle available to consumers. Romm (2004) states that the benefit of compressed hydrogen gas is that it does not need to be stored in a cryogenic vessel such as liquid hydrogen gas. It is more affordable for hydrogen gas to be compressed from a 5,000 to 10,000 psi range than having liquid hydrogen stored at a low temperature that needs continuation of electricity (like a refrigerator). The major downturn to gas tanks such as 5,000 psi and 10,000 psi is the volume. The volume would be respectively ten and seven times greater than that of gasoline. However, a 10,000 psi tank with a good driving range has only four times the size of a gasoline tank. At such high compression, safety measures must be developed such as incorporating seals and values (currently very expensive) onto the tanks which add extra weight and cost to the overall vessel. An additional drawback is the cylindrical shape that it needs to be, which restrains the overall designs of the vehicle. As illustrated, an 8,000 psi vessel is estimated to cost around $2,100 per kilogram because the hydrogen needs to be compressed by the usage of electricity. A benefit to compressed hydrogen, unlike liquid hydrogen, is the fewer amount of carbon dioxide production because it uses less electricity. A vessel tank with one kilogram of hydrogen that compresses at 10,000 psi would result in seven pounds of carbon dioxide, which is one third of that from a gallon of gasoline (p.95-96). The other form of hydrogen storage is the liquid form that has its own benefits and restrictions.
Liquid hydrogen, not a normal phase that exists in nature, must be stored in a cryogenic (super-insulated) tank. A super-insulated tank would get the temperature of hydrogen gas down to -253°C (-423°F)--just a little above absolute zero. The process of turning hydrogen gas into liquid is an expensive process since the gas needs to be compressed and then cooled to a specific volume. Although the process is expensive, the benefit would result in lighter tanks that have a better storing capacity than any other state of phase that hydrogen takes. Consider the following statement reported by General Motors Corporation: A 90 kg cryogenic tank with 4.6 kg of liquid hydrogen would result in a volume of 34 gallons (Romm, 2004, p.94-95), which is roughly twice the volume of an average car that contains gasoline. This illustration shows that liquid hydrogen would be an ideal way to store hydrogen, but the expensive cost and the constant power needed to keep the tank at a freezing temperature outweigh the benefits. In addition, Romm (2004) mentioned the other disadvantages to liquid hydrogen, firstly a loss in 40% of its output energy in going from gas to liquid and secondly the evaporation problem. Liquid hydrogen stored in a cryogenic tank that remains idle for a couple of days will evaporate (GM claims to have their tanks evaporate at a 4% rate). On a larger scale, NASA claims that the space shuttle, which uses liquid hydrogen as fuel, would lose 100,000 lbs for each fill-up due to evaporation. In addition, the electricity needed to produce hydrogen liquid is equivalent to the carbon dioxide emission to one gallon of gasoline emitted into the atmosphere (p.94-95).

These forms of storage for hydrogen are possible for modern application within hydrogen vehicles, but they are not very efficient as compared to gasoline vehicles. However, with continual research on these storage forms, and possibly the usage
of alternative energy to either compress hydrogen gas or liquefy hydrogen; hydrogen vehicles will become more efficient. Before examining other storage forms, it is important to understand the material aspects and the conventional way of storing hydrogen gas.

**Gas Cylinders Materials**

The conventional way to store gas is through a gas cylinder made out of steel. For its strong properties, gas industries use steel cylinders to store and transport gases such as hydrogen. Even though steel is strong enough to withstand compression pressure of 80 MPa (the maximum pressure that the industry compressed the gas), it does not qualify as a good material to construct a hydrogen storage tank used in cars. Instead, hydrogen storage on a car would require that steel be substituted for some other material. An internal liner (most likely aluminum), with an outer winding of a composite fiber with a variety of grades in glass or carbon embedded in a variety of matrices will be more suitable than steel (Rend & Dell, 2008, p.150-151).

There exist two different designs methods in making a hydrogen storage tank for car applications. The first method is called the ‘hoop-wound,’ which consists of the process of wrapping the vertical wall of the tank in a parallel fashion with a composite. This process is desirable because it is easy to fabricate and the it is low in cost. The second method is known as the ‘fully-wound’ method [Figure 2], which has a liner that makes up the internal surface of the tank. Having a high molecular weight, polymeric material makes the liner, the tank is able to withstand a higher pressure but the cost will be much more (Rend & Dell, 2008, p.151).
Due to high cost, there is a need for current developments in materials fiber to make hydrogen tanks for car applications more affordable and safe. The overall target is to form a tank that can withstand 70 MPa (10,000 psi) that weighs 110 kg (about 242 pounds). However, there is another method in storing hydrogen gas at a lower pressure with higher storage. Through the process known as ‘cryo-compression,’ hydrogen gas would be compressed and then liquid cooled. With the wall of the hydrogen tank made out of carbon, the injected hydrogen gas would be cooled and kept at a freezing temperature of 77K (about -321°F). The low temperature allows the compressed gas that enters into the tank to be cooled down and absorbed into the carbon wall, thus allowing more hydrogen to be stored as compared to compressed or liquid gas (Rend & Dell, 2008, p.152-153).
The chemistry to this phenomenon can be explained as follows. Under ‘cryo-compression,’ the tank has a freezing temperature of 77K, which will slow down the hydrogen gas atoms kinetic energy upon entering in as a compressed gas. When the gas atoms begin to slow down, the carbon liner would then absorb some of them. Carbon, with four valance electrons, makes a good liner for hydrogen gas because it will make the absorption process easy since hydrogen has only one valance electron. Therefore, slowing down the kinetic energy of these gas atoms allow more atoms to occupy a fixed volume. Although this method seems possible, it is important to keep the tank at 77K to prevent any possible harm such as an explosion (Rend and Dell 155). There exists other methods in storing hydrogen gas; however, developments must be made since these methods are more complex than the ones mentioned before.

**Storing Hydrogen Gas by Developing Methods**

Traditionally, hydrogen gas is best known as either being a liquid for applications such as the space shuttle boosters that NASA currently uses, or as compress hydrogen gas in steel cylinders for storage and delivery for everyday usage. However, storing hydrogen gas in either of these forms may not be efficient for automobile applications. With support from governments and other agencies such as the Department of Energy, scientists and engineers are currently researching other potential storing methods for implementing hydrogen gas into automotives. Since there are many methods, the three that are interesting to look at are metal hydrides, carbon-based materials (high surface area sorbents), and chemical hydrogen.


**Metal Hydrides**

Metal hydrides are materials such as metals that have chemical bonds with hydrogen atoms. The temperature and pressure needed to break the chemical bonds between the metals and the hydrogen atoms depend on the strength of its bonds. The stronger the bonds, the higher the temperature and pressure needed to break them. Covalent molecular hydrides such as methane (CH₄) have stronger bonds than ionic hydrides (LiH) because covalent bonds have atoms that are bonded together more strongly since they “share electrons” more closely. Due to the independent temperature and pressure that each metal hydride requires to break bonds, the dependency of a catalysis is sometimes needed (a secondary reagent) to speed up the chemical destruction of the atoms bonds. As these bonds break, the metals release the hydrogen atoms to power the vehicle, while the metals remain in the fuel tank. Romm (2004) stated that these metals are considered reversible hydrides when they allow themselves to reform bonds with hydrogen atoms (in the event of refueling); otherwise, it is considered as irreversible hydrides that need to be “shipped to a chemical-processing plant” (p.98). Although metal hydrides have a compact storing capacity, it presents a weight problem. One kilogram of hydrogen would require at least fifty kilogram of storage tank. Due to its energy to weight ratio, this method of storage for hydrogen gas is currently ineffective and remains an area of research (p.98). It is interesting to note how metal hydrides are formed.

Formation of a metal hydride requires applied pressure to hydrogen over a period of time to form a solid solution with a chosen metal element (i.e. copper). With the increase of hydrogen pressure to the ratio of hydrogen to metal atoms [Figure 3], the alloy (two or more metals) will begin to become a hydride (the
addition of hydrogen atoms) once the condition is right (Eftekhari, 2008, p.353).

Figure 3: A diagram of the transformation from an alloy to a metal hydride through the increase in both the hydrogen pressure (vertical axis) and the hydrogen to metal ratio (horizontal axis) (Image from Eftekhari, 2008, p.353).

It is important to note the behavior of the graph in [Figure 3]. There is a point in time when the alloy begins to have a constant hydrogen pressure with an increase of hydrogen to metals ratio (as illustrated by the horizontal lines). The constant hydrogen pressure allows the alloy (represented by the initial unfilled white circle) to become a complete hydride (represented by the final filled black circle). This trend behavior is similar to that of boiling water. Water will continue to boil at 100°C and will stay at this temperature for some time until all the water molecules establish this temperature. With continual heating (increased temperature),
the liquid will then become steam (similar behavior to the illustration of the second slope line in the figure).

In addition, research has been done in the area of intermetallic compound for they can be used as hydrogen storage. These compounds consist of three types: “alloys composed of rare earth (RE) with nickel (AB5 - type) and alloys of zirconium and vanadium with nickel (AB2 - type), as well as titanium and magnesium with nickel (AB- or A2B - type)” (p.354). For example, LaNi5 (AB5 - type), which arrange in a hexagonal CaCu5 structure, can absorb 6 H per formula unit. On the other hand, TiFe, AB - type, (although not a storage efficiency material) is lighter and cheaper than LaNi5. Furthermore, Mg2Ni requires a high temperature of 250°C [482°F] to enable the release of hydrogen atoms (Eftekhari, 2008, p.354-255).

Metal hydrides have many problems, for example they can not store large amounts of hydrogen atoms, are expensive, are not a safe energy carrier, and need a higher temperature to discharge hydrogen atoms at a stable rate (Eftekhari, 2008, p.355). In addition, Ordaz, Petrovic, Read, Satyapal, and Thomas (2006) stated that the control of thermal management and constructing a tank to withstand heat from the process of absorption/desorption are other problems to metal hydrides that are still in development. Heat is a major concern with metal hydrides because as it breaks/reforms bonds, an amount of heat would be release as part of the process. Therefore, the tank that stores these metal hydrides must be able to withstand the heat released. Besides having metal hydrides as possible storage materials for hydrogen atoms, carbon-based materials (high surface area sorbents) are also possible.
**Carbon Materials (Nanostructure Materials)**

Carbon based materials such as nanofibres and nanotubes are different than metal hydrides. A big advantage of carbon materials is the major heat transfer problem that it does not require. To recall, metal hydrides require a high temperature to absorb/release its hydrogen atoms while carbon materials do not. In addition, unlike metal hydrides that require hydrogen atoms to dissociate themselves into the structure to form a stronger bond with the alloy (chemisorption process), some forms of nanostructure materials are bonded together by a “weak molecular-surface interaction” (physisorption process) (p.172). These carbon-based materials, also known as nanostructure materials, take the shape of hexagons and pentagons that arrange themselves into a ball-like shape that consists of sixty carbon atoms ($C_{60}$ or also called fullerene) (Rand and Dell, 2008, p.172).

Nanotubes can be classified into two categories: “single-walled” or “multi-walled.” “Single-walled” consists of one graphene layer for capturing hydrogen atoms, while “multi-walled” has several concentric rings. The problem with “multi-walled” is the difficulty for hydrogen atoms to penetrate into the multiple layers formation (Rend & Dell, 2008, p.172). Furthermore, the major problems with carbon nanotubes are the inaccurate and non-producible data (Rand & Dell, 2008, p.172; Ordaz et al. 2006) to confirm the exact hydrogen storage capacity. In addition to metal hydrides and nanostructure materials as potential hydrogen storages, chemical hydrogen is also a possibility.

**Chemical Hydrogen Storage**

Chemical hydrogen is a process where heat, either endothermic (heat entering into the chemical reaction) or exothermic (heat leaving the chemical reaction), is applied to a
Chemical reaction. For a typical chemical reaction, there exist three things: reactants, heat, and resultant. For example, in a hydrolysis reaction, a chemical hydride combines with water (known as reactants) will lead to the production of hydrogen gas, and by-products (known as resultants) by an endothermic/exothermic (heat) application. According to the Ordaz et al. (2006), there are two promising hydrolysis reactions that could store hydrogen gas efficiently.

\[
\begin{align*}
[1] \quad & \text{NaBH}_4 + 2\text{H}_2\text{O} \rightarrow \text{NaBO}_2 + 4\text{H}_2 \\
[2] \quad & \text{MgH}_2 + \text{H}_2\text{O} \rightarrow \text{Mg(OH)}_2 + \text{H}_2
\end{align*}
\]

Equation [1], sodium borohydrides, has a high hydrogen capacity, but the kinetic of the hydrogen atoms being released is faster than the desire rate (Ordaz et al. 2006) for car applications. However, Ordaz et al. also mentioned that a pH or a catalyst could control the chemical reaction kinetic. In addition, there is also the problem in the regeneration process of the by-product borate (NaBO₂) (2006). After the chemical reaction occurs and there are no more hydrogen atoms, the by-product must be regenerated off-board (2006) with hydrogen atoms which is an inconvenient process.

Equation [2], magnesium hydrides, takes a different approach in storing hydrogen atoms. The reaction requires a slurry (semi-liquid) to store the magnesium hydrides just before the reaction happens (Ordaz et al. 2006). Although, storing hydrogen gas as magnesium hydrides yields a maximum of 11 wt. % (the percentage of the absorbing gas compare to the total weight of the system) (Ordaz et al. 2006), there exists one major problem. Having to carry water on-board for the slurry, the overall system will weight more and adds more complexity (Ordaz et al. 2006).
Although these three storage methods pose their own challenges, continual research is ongoing. Besides being a potential for storing hydrogen gas, these methods could also be considered for transporting a huge amount of hydrogen gas to hydrogen infrastructures (which is another major problem beyond the scope of this paper). Whether these methods are being considered for hydrogen storage or massive transportation to infrastructures, safety issues about hydrogen gas is a major concern that needs clarifications.

**How Safe is Hydrogen Gas?**

A misconception that people have about hydrogen gas is that it is dangerous due to its flammability. When referred to hydrogen gas, events such as the Hindenburg and NASA Space Shuttle Challenger in 1986 come to mind. For the tragic Hindenburg event, hydrogen gas that was used to inflate the blimp was not the main cause. As explained by Addison Bain, a retired NASA engineer who investigated this case closely, found out the facts to this tragic event. It turned out that the blimp was coated with a “dopant of cellulose acetate butyrate with powered aluminum and iron oxide,” (118-119) which was extremely flammable. Due to the electrostatic atmosphere that day, the paint that coated the blimp ignited which then burned the hydrogen gas in less than a minute. Interestingly, other gases (i.e. helium) would result in a more tragic event because the flaming blimp would not stay afloat as long as hydrogen when it burns. This is caused by the differences in buoyancy (the tendency to float in air or water) that each gas atoms have. If helium were used to fill the blimp instead, the burning blimp would have burned to the ground much faster and endangered many other lives than hydrogen. Therefore, the buoyancy of hydrogen kept the burning blimp afloat most of
the time while it was burning before hitting the ground (Holland & Provenzano, 2007, p.118-119).

As mentioned by Romm (2004), hydrogen must have strict standards to ensure safety. Due to the dangerous properties of hydrogen gas, strict standards are needed to prevent people from getting hurt or even killed. Hydrogen does not radiate heat (the heat that is felt from a burning furnace) when it burns, it is odorless, and invisible to the naked eye. For this reason, a person can walk into a hydrogen flame without knowing it. In addition, due to its high flammability property, storing hydrogen in a car is a big safety concern. As described in a 2003 report by Arthur D. Little Inc., hydrogen can be ignited by common static such as sliding across the seat or by the usage of a cellular phone. It is important that leaks and ruptures from the storage tanks be detect immediately to prevent any incidents (p.104-108). Although all these properties of hydrogen pose safety concerns that make hydrogen unlikely for vehicles application, however Holland and Provenzano think differently about this.

According to Holland and Provenzano (2007), hydrogen is as safe as gasoline. In fact, hydrogen can be safer than gasoline in some cases. In a study conducted by the University of Miami School of Engineering in early 2001, a lead professor named Michael Swain and a group of students compared gasoline and hydrogen gas in a worst-case scenario study. A Ford Escort was first converted to carry hydrogen gas, along with the incorporation of heat sensors and a ventilated system. Remotely, the team then triggered a hydrogen leak at 3,000-cubic-feet-per-minute from the car that was then ignited. Due to the high hydrogen pressure, a flame that was seventy feet high shot upwards. The team inspected the car and found out that both the interior and exterior of the car
was left undamaged. In addition, the heat sensors detected that the passenger side did not rise more than seven degrees (near the location of the ventilating system), while the driver side rose less than three degrees. The same testing was then carried out for the same car, but this time with the storage of gasoline. The gasoline leak was carried out by a remote control that was then ignited. As expected, the entire car went up in black flames in under two minutes (p.121-122).

Although it is true that hydrogen gas has dangerous properties, with a strict safety code and standards, it is a matter of time until it is as safe to use as natural gas and gasoline (Holland & Provenzano, 2007, p.124-125). Such standards would require the enforcement on the storage of hydrogen gas on automobiles and safety refueling procedures. Even though hydrogen has its own dangerous factors as compared to gasoline, it does have some safe sides. As mentioned by Holland and Provenzano (2007), hydrogen has a diffusion rate at twenty meters a second and is lighter than air which allows it to dilute quickly into the air (p.123). This is the reason why hydrogen gas pools upward while gasoline pools outward. Similar to other gases that have strict standards, hydrogen will be safe to use like any other gases that are used everyday.

**Conclusion**

Gasoline has been used for over a century and it will continue to be for years and decades to come. Although this is the case, alternative vehicles are slowly making their way into the automotive market. In order to compete against gasoline-powered vehicles, alternative vehicles will heavily depend on alternative energy to power its vehicles. For instance, hydrogen gas vehicles will likely get hydrogen fuel from water by the usage of electricity
produced from alternative energy. If this is not the case, then hydrogen cars would not be considered as an alternative vehicle because it will likely depend on fossil fuel to produce the electricity needed in generating hydrogen gas from water. In addition, hybrid vehicles such as the popular Toyota Hybrid and future electric vehicles such as Tesla are doing well in the market. It can be assumed that hydrogen vehicles are not yet a good contender due to some major challenges it faces. Nevertheless, there are several hydrogen prototype vehicles that exist. Honda FXC Clarity and the BMW Hydrogen 7 are some of the prototypes that show running a car on hydrogen is not an impossible task. Additional research is currently ongoing to find ways to store hydrogen gas more effectively and efficiently. This is made possible due to the significant amount of funds and grants that are invested in hydrogen vehicles to make them at least as efficient to gasoline vehicles. The future of hydrogen vehicles is looking bright and it will only be a matter of time until hydrogen vehicles become part of the solution for gasoline dependency and climate challenges.

References


**Acknowledgements**

I would like to thank my mentor, Dr. Fred Barez, for giving me the opportunity for being his mentee. In addition, special thanks to the McNair staff that always provided me with their time and support: Jeannine Slater and Nisha Gurbuxani. I would like to thank my parents and brothers who have been there to support and encourage me to do well in school. Lastly, a final thanks go out to all others that I did not mention in this paper but contributed to my research. From the bottom of my heart, thank you all so much.
<table>
<thead>
<tr>
<th>Christian J. Espinoza Santos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Materials Engineering</td>
</tr>
<tr>
<td>Mentor Dr. Guna Selvaduray</td>
</tr>
<tr>
<td>Mechanical, Thermal, Chemical, and Morphological Characterization of the Coconut Fiber</td>
</tr>
</tbody>
</table>

**Biography**

As a Peruvian immigrant and first generation to attend college, education has become the key to achieving Christian’s *American Dream*. He immigrated to the USA when he was sixteen and his passion for Materials Engineering has allowed him to overcome many obstacles. In the past five years he has been involved with seven research projects with Owens Corning, FiberLite, NASA, McNair, Boeing and Tyco Electronics. His enthusiasm for research was fed by NASA where he had designed and conducted independent research. He developed a process reducing the density of heat-shield materials used in the Galileo-Jupiter and Pioneer-Venus missions and published his research on Chop Molded Carbon Phenolic Ablators as first author in the NASA journals and as third author in the AIAA. He shares a patent for the Densification Process of the Surface of Phenolic-Impregnated Carbon Ablator and a technical disclosure for Silica and Carbon Graded-Ablator. Christian has received an invitation for a Ph.D. in Materials from his dream school, the University of Illinois at Urbana-Champaign.
Mechanical, Thermal, Chemical, and Morphological Characterization of the Coconut Fiber

Christian J. Espinoza Santos *,a,b

a Ronald E. McNair Scholars Program, San Jose State University, San Jose, California 95192

b Department of Chemical and Materials Engineering, San Jose State University, San Jose, CA 95192

ABSTRACT

The purpose of the paper is to provide the findings gathered from the characterizing of the coconut fiber. The first part of the paper will provide a general background of natural fibers such as their demand on the global market, their chemical composition, their properties, reasons coconut fibers could be considered for engineering applications and advantages as well as constraints. In addition, the paper will describe steps for extracting fiber from the coconut shell as well as fiber treatment as found in the literature. The second part of the paper will describe the characterization, such as optical imaging and scanning electron microscopy (SEM), moisture tests, thermogravimetric analysis (TGA), Fourier Transform Infra-Red (FTIR) Spectrometer analysis and mechanical testing of the coconut fibers. The final part of the paper will provide a conclusion and also describe the future work to be conducted.
Introduction

Natural fibers are an abundant source of materials in the world and are mainly used in tropical locations such as Brazil, the Philippines, India, Thailand, Indonesia, China, and Bangladesh. Natural fibers represent an environmentally friendly alternative to synthetic fibers because they are abundantly available resources. In 1993, the plastics industry used 7.7 billion pounds of synthetic fillers (short fibers) [1-3]. These fillers are predominantly used in five industries: paint, paper, plastic, rubber, and adhesives/sealants [3-5].

In 1997, the global filler market was estimated to be $23 billion per year and growing at a 9 percent annual rate [4-6]. It is expected that by the end of 2008 the global market for non-renewable synthetic fillers could reach above $49 billion per year. The potential use of natural fibers could be considered to replace expensive and non-renewable synthetic fillers (short fibers) [6].

The fiber market is a multibillion dollar industry. Glass and carbon fibers, used in 95% of cases, are the dominant fiber [4,7]. As a result, the level of demand for carbon fiber has steadily increased in coordination with the number of industrial applications using carbon composite materials [6]. Similarly, the glass fiber market reached $7 billion in 2007 and is projected to increase 2% per year in fiber reinforcement plastic application [7].

During the early 19th century, natural fibers were primarily considered for the production of textiles. However, in the late 19th century the demand for natural fibers decreased. With the current unstable prices of oil, the production of synthetic fibers is no longer the most adequate solution. Many industries, and now governments, are faced with the challenge of finding an environmentally sustainable resource that could substitute synthetic fibers. As a result, the increase in usage of natural fibers is
evidently necessary and has been taking place in the European Union. Currently, Germany uses natural fibers in many of their fiber reinforced composite processes.

Presently, the United States government has proposed that private industries utilize more environmentally friendly materials. As a result, the composite and polymer manufacturing industries have considered using more environmentally sustainable materials such as natural fibers for reinforced polymers to benefit the environment by reducing global waste. In the past, natural fibers were used in traditional ways for textiles and geotextiles such as twines and ropes, special pulps, insulation, fences, padding materials, fleece, felts, and non-woven materials. Recently, natural fibers have been considered for applications beyond those of textiles and insulation applications, shown in Figure 1.
### Products in the Past

<table>
<thead>
<tr>
<th>Products</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sisal Ropes</td>
<td><img src="image" alt="Sisal Ropes" /></td>
</tr>
<tr>
<td>Heavy Jute Rug</td>
<td><img src="image" alt="Heavy Jute Rug" /></td>
</tr>
<tr>
<td>Hemp Strips Rug</td>
<td><img src="image" alt="Hemp Strips Rug" /></td>
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</tbody>
</table>
# PRODUCTS IN THE PRESENT

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>IMAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beams, Flooring, Panels, Siding, Sheathing, Flooring, and Pipes are made of Jute Sisal and hemp.</td>
<td>![Imagery of a product]</td>
</tr>
<tr>
<td>The skateboard is composed with 70% Natural Fibers (Jute, Malva, Gruau) and 30% post production Recycled Polypropylene.</td>
<td>![Imagery of a skateboard]</td>
</tr>
<tr>
<td>Flax, Hemp, Sisal, and other Natural Fibers are used to make 50 Mercedes-Benz E-Class Components.</td>
<td>![Imagery of automotive components]</td>
</tr>
</tbody>
</table>
Natural fibers are composed of cellulose and lignin [6,7]. The amount of cellulose and lignin will vary depending on the species and the age of the plant. Cellulose is a hydrophilic-glucan polymer composed of the linear chain of 1,4-β anhydroglucose units [6,8]. The atomic ratio of carbon (C) to hydrogen (H) to oxygen (O) in the cellulose is 6:10:5, and the chemical formula is written as \((\text{C}_6\text{H}_{10}\text{O}_5)_x\). Figure 2 shows cellulose and its hydroxyl, carbonyl stretching and -C-H- groups [6,8]. Nature provides a unique cellulose and lignin chemical structure, and the functional groups of each plant control the mechanical properties of the natural fibers.

Lignin is relatively hydrophobic and aromatic in nature. The degree of polymerization of lignin is difficult to measure because it is both fragmented during extraction and the molecule consists of various types of substructures which appear to repeat in a random manner, as shown in Figure 3 [8,9].
Natural fibers have comparable properties to synthetic fibers. Table 1 shows the mechanical properties of natural and synthetic fibers. The percent of elongation of the natural fibers is similar to that of synthetic fibers; however, natural fibers have lower tensile strength and Young’s modulus. Moreover, natural fibers such as coir, hemp, jute, sisal, and cotton possess lower density than the synthetic fibers, which have greater fiber diameter as given in Table 1. Natural fibers show great potential as a material of choice and are researched internationally in an effort to find alternatives to synthetic fibers.
Table 1: Characteristic Values for Density, Diameter, and Mechanical Properties of Vegetable and Synthetic fibers [9].

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Density (g/cm³)</th>
<th>Diameter (µm)</th>
<th>Tensile Strength (MPa)</th>
<th>Young's Modulus (GPa)</th>
<th>Elongation at Break (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flax</td>
<td>1.5</td>
<td>40-600</td>
<td>345-1500</td>
<td>27.6</td>
<td>2.7-3.2</td>
</tr>
<tr>
<td>Hemp</td>
<td>1.47</td>
<td>25-500</td>
<td>690</td>
<td>70</td>
<td>1.6</td>
</tr>
<tr>
<td>Jute</td>
<td>1.3-1.49</td>
<td>--</td>
<td>393-800</td>
<td>13-26.5</td>
<td>1.16-1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>930</td>
<td>53</td>
<td>1.6</td>
</tr>
<tr>
<td>Kenaf</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Randie</td>
<td>1.55</td>
<td>--</td>
<td>400-938</td>
<td>61.4-128</td>
<td>1.2-3.8</td>
</tr>
<tr>
<td>Nettle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sisal</td>
<td>1.45</td>
<td>50-200</td>
<td>468-700</td>
<td>9.4-22</td>
<td>3.0-7.0</td>
</tr>
<tr>
<td>PALF</td>
<td></td>
<td></td>
<td>413-1627</td>
<td>34.5-82.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Abaca</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Palm EFB</td>
<td>0.7-1.55</td>
<td>150-500</td>
<td>248</td>
<td>3.2</td>
<td>25</td>
</tr>
<tr>
<td>Oil Palm Mesocarp</td>
<td></td>
<td>--</td>
<td>80</td>
<td>0.5</td>
<td>17</td>
</tr>
<tr>
<td>Cotton</td>
<td>1.5-1.6</td>
<td>Dec-38</td>
<td>287-800</td>
<td>5.5-12.6</td>
<td>7.0-8.0</td>
</tr>
<tr>
<td>Coir</td>
<td>1.15-1.46</td>
<td>100-460</td>
<td>131-220</td>
<td>4.0-6.0</td>
<td>15-40</td>
</tr>
</tbody>
</table>
**Reasons Natural Fibers Could Be Used In Engineering Applications**

Natural fibers represent an environmentally friendly alternative to synthetic fibers. They can be considered for the development of polymeric composite materials because they are nontoxic and biodegradable [8]. Natural fiber reinforcements can be used to provide optimal properties to fiber-reinforced composites [8]. Further, natural fibers can be used in their natural stages and can be tailored to have similar properties as synthetic fibers [6]. Their surface can be chemically and physically treated to reduce moisture sensitivity and biological decay using alkaline treatment and retting [8]. In addition, commercializing natural fibers would yield benefits in supply, cost and environmental impact because they can be recovered from waste that otherwise would be discarded [2,13].

**Limitation of Natural Fibers**

Natural fibers have some limitations, however, which are mainly their lower processing temperatures (~ 200°C) due to the lignocellulosic [14] and moisture content. Various works on the applications of natural fibers like sisal, flax, jute, cotton, bamboo, wood, henequen and banana, used as reinforcements in composites have been reported in the literature. Murali and Rao studied the extraction and tensile properties of bamboo and palm and found that bamboo and palm have similar tensile strength (bamboo 341 MPa and palm 377 MPa), but different percent tensile strain (bamboo 1.73% and palm 13.71%) [15]. Jahan, Kanna and Chowdhury reported the variations in chemical characteristic and pulpability within the jute plant. They reported that the α-cellulose (bark of jute 61.9 ± 1.9 and core of jute 34 ± 1.0%) in the bark was higher that lignin (bark of jute 13.74% and core of jute 24.42%)
was lower than core [16]. Sherely, Boundenne and Candau found that the thermal conductivity and thermal diffusivity of the banana/polypropylene composite decreases with fiber loading as shown in Table 2 [17].

Table 2 Thermal Conductivity, thermal diffusivity, specific heat and density of PP/banana composite [17].

<table>
<thead>
<tr>
<th>Composite Samples (with untreated banana fibers)</th>
<th>$K$ (Wm$^{-1}$k$^{-1}$)</th>
<th>$a$ ($\times 10^{-7}$m$^2$s$^{-1}$)</th>
<th>$C_p$ (jkg$^{-1}$k$^{-1}$)</th>
<th>$\rho$ (kgm$^{-3}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP only</td>
<td>0.240 ± 0.001</td>
<td>1.66 ± 0.04</td>
<td>1588 ± 42</td>
<td>910 ± 10</td>
</tr>
<tr>
<td>PP + 0.1Vf</td>
<td>0.217 ± 0.002</td>
<td>1.43 ± 0.07</td>
<td>1642 ± 104</td>
<td>924 ± 36</td>
</tr>
<tr>
<td>PP + 0.5Vf</td>
<td>0.157 ± 0.002</td>
<td>1.05 ± 0.03</td>
<td>1522 ± 72</td>
<td>982 ± 35</td>
</tr>
</tbody>
</table>

Coconut fiber is one of the most important natural fibers produced in tropical countries such as Indonesia, Panama, Thailand, Brazil and Malaysia. Limited work has been reported on the development of a new composite with coconut fibers. The coconut fiber has the potential for use in a composite matrix for its strength (35.48 MPa) and modulus properties (~2800 MPa) [18]. Therefore, the objective of this paper is to characterize the coconut fiber using the Digital Spring Scale, TGA, FTIR and Optical/SEM and for the future development of a new type of composite material reinforced with coconut fiber.
**Motivation**

Composite materials have had a greater demand in recent years. Composites depend on the supply of synthetic fibers such as carbon, glass and Kevlar, etc. If natural fibers can meet this demand for polymeric composites, then natural fibers will result in the next generation of composites, while reducing natural waste. For instance, the coconut fiber composite has not been developed and understood thus far. There are limited studies on abundant coconut fibers and their potential reinforcement applications for both thermoset and thermoplastic composites. In many third world countries, homes of impoverished people are made of flimsy materials such as cardboard, plastic and paper, etc. People in third-world countries are in need of affordable materials for structural applications. There is a great potential that non profit organizations with the mission to build homes for such families could take advantage of with this new type of composite.

**Coconut Fibers**

The origin of the coconut is uncertain. There is some evidence that the coconut plant may have propagated by sea; the fruit may have fallen from the tree into the water and traveled by marine currents to other countries. Coconut trees grow in tropical places such as Hawaii, Indonesia, and Panama. In a survey conducted in 2002, it was found that coconut production in the world is about 118 billion pounds and the fruit is produced in 92 countries, as shown in Figure 4.
The bubble map shows the global distribution of coconut 2005 as a percentage of the top producer (Indonesia - 16,300,000 tones) [19].

As a result 394 million coconuts’ waste is produced per year [19-21]. Coconut fibers are considered a biomass waste that can potentially be used in reinforcement material. The chemical composition of coconut fibers is shown in Table 3.

**Table 3 Chemical Components of Coconut Fiber** [22].

<table>
<thead>
<tr>
<th>Component</th>
<th>Old Nut (%)</th>
<th>Young Nut (%)</th>
<th>Very Young Nut (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>5.25</td>
<td>16.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Pectin &amp; Other Soluble</td>
<td>3.00</td>
<td>2.75</td>
<td>4.00</td>
</tr>
<tr>
<td>Hemicellulose</td>
<td>0.25</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>Lignin</td>
<td>45.84</td>
<td>40.52</td>
<td>40.02</td>
</tr>
<tr>
<td>Cellulose</td>
<td>43.00</td>
<td>32.86</td>
<td>36.11</td>
</tr>
</tbody>
</table>
**Current Products**

The coconut is a versatile plant because every part could potentially be used for multiple applications. For example, the leaves can be used as material for roofing, baskets and brooms. The trunk of the plant is used as timber and building material in rural areas [19]. It is reported in literature that coconut roots are used as dyes [19]. The juice of the coconut plant core is used for the production of vinegar and alcoholic drinks. However, the meat and the water of the coconut are the main parts used. Recently, the use of the coconut shell was considered as an ingredient for glue [19]. It was also reported that the coconut shell is used to make charcoal [19].

The coconut fibers are used to make mattresses, rugs, doormats, and ropes, but there is still much research needed on their properties and their possible applications. The limited amount of research restricts the development of future applications in the area of polymeric materials.

**Fiber Extraction**

Based on literature research, coconut fiber is obtained from the husk surrounding the nut, that is, the fruit of the coconut plant. The following steps are needed in order to extract the fibers from the coconut:

- The coconut must be immersed in water and pounded with stone to remove the woody portions.
- The fibers must then be hacked with a steel comb and dried.
- After 5 days the fibers must be removed and run through a machine composed of two rollers to crush the fibers.
The husks must then be held against the revolving drums and the spikes would then tear out the woody parts.

- The fibers should then be spread out in the sun to reduce moisture.

The purpose of this experiment is to contribute to the current body of research on the characterization of coconut fibers by providing findings and comparing reported values from past research. For the future, it is hoped that coconut fibers will be used as polymeric reinforcements in target applications.

### Experimentation

#### Materials

The coconut fibers were supplied (supplier, Indonesia) in the form of long fibers. One part of these fibers was washed with hot tap water (80°C) for 30 minutes to remove decayed materials. After the fibers were washed with tap water, they were dried with Scott white paper towels (Scott® Branded Products) and dried in an open atmosphere (25°C) for 72 hours and were placed under vacuum for 8 hours.

#### Characterization of the Coconut Fibers

The coconut fiber was characterized using the following methods.

1) The weight and diameter of about 17 coconut fibers were measured using an analytical balance (Scientech ZSA80, ±0.0002g) and digital micrometer calliper (Mitutoyo, ±0.001mm). The diameter was measured at four points of ~20 cm long samples and the density was calculated.

2) The fracture strength of the coconut fibers was measured using a digital spring scale (Rapala®). 1, 2, 4, and 6 ounces lead fishing weights were used (Blue Ocean Equipment INC) with a custom
made S-hook. The coconut fiber was bent around the digital spring scale hook and a custom made hook, and secured with 3cm Scotch transparent tape (3M) on both ends of the fiber, as shown in Figure 5. The lead fishing weights were placed on the hook and the weight was recorded with the digital spring scale. The fracture strength of the fibers was calculated using the recorded weight and the sectional area of the fibers.

Figure 5 Digital Spring Scale used to record the fracture Strength of the fiber
3) Micrographs of the coconut fiber were obtained using Optical and Scanning Electron Microscopy (SEM, FEI Quanta 200) to look at the surface roughness.

4) The moisture content was evaluated using an analytical balance (Scientech ZSA80, ± 0.0002g) to measure the initial and final weight at time intervals until a constant value was reached. The coconut fibers were heated to a maximum temperature of 80°C using an oven (Isotemp Vacuum Oven Model 282A). Equation 1 shows the formula used to calculate the moisture content in the fibers where \( W_o \) and \( W_f \) are the initial and final weights, respectively, of specimens.

\[
W = \frac{(W_o - W_f) \times 100}{W_o}
\]

**Equation 1**

5) Thermal analysis of coconut fiber (10 mg) was done with a Thermogravimetric analyzer TGA (NETZSH FTA-409) under air atmosphere in the temperature range of 0 to 1200 °C with a heating rate of 10 °C/min.

6) The Fourier Transform Infrared Spectra, FTIR (spectrometer Spectrum 2000 Perkin Elmer), measurements were made with KBr powder in the 500 – 4000 cm\(^{-1}\) region, resolution of 4 cm\(^{-1}\) with 20 scans and a single beam. The mixture of KBr and coconut fiber was milled and then dried (100 °C for 2 hours) and the samples were prepared immediately before measurement.
Results and Discussion

**Density and diameter distribution**

The density of the coconut fiber was calculated to be ~1.5 g/cm$^3$. The value is comparable to other natural fibers such as jute (1.3-1.49 g/cm$^3$), flax (1.5 g/cm$^3$), and Sisal (1.45 g/cm$^3$) [4]. All other natural fibers, including coconut fiber, have densities lower than E-glass (2.55 g/cm$^3$) fiber and carbon (1.78 g/cm$^3$) fiber [4]. The coconut fiber diameters measured is as shown in Figure 6. The frequency distribution was calculated assuming the coconut fibers have a cylindrical shape. The diameter range is from 200 - 280 μm with an average value of ~244 μm.

![Frequency Versus Fiber Diameter](image)

**Figure 6 Frequency versus fiber diameter**

Optical and Scanning Electron Micrographs of the coconut fibers showed a fiber with a diameter of ~200μm, as shown in Figure 7.
and Figure 8. The optical images of the coconut fibers were taken at 1.25X and 5X and the SEM images were taken at different segments of the fiber. Also, Micrographs reveal the surface of the coconut fiber is not uniform. Surface roughness of the fibers ensure mechanical interlocking and bonding in polymeric composites.
The SEM images of the coconut fiber (Figure 9) and the carbon fiber (Figure 10) were taken to study differences in morphology. It was observed that the surface roughness of the coconut fiber is not uniform. However, the surface of the carbon has a smooth, ribbed texture.
**Moisture Content**

The coconut fiber moisture content will vary depending on several factors such as origin, species, and age of the coconut such as reported in literature: very young coconut (15% of moisture), young coconut (16% of moisture) and old coconut (5.25% of moisture) [22]. The measured moisture content of the coconut fiber was ~5.1 ± 1.37 percent as shown in Appendix A. The results reported in the literature cannot be compared to the results found on the fiber because of the differences in origin and age of the coconut. The determination of content, temperature, and time necessary to eliminate the moisture is important for the composites processing. Moisture content could lead to the delamination of the fibers and compromise the mechanical strength of the fiber. Reducing the moisture of the fibers helps keep a consistent matrix and good adhesion with the resin.

**Mechanical Properties**

The fracture strength of the fiber, 91 ± 32 MPa, value was below the reported value (131-220 MPa) in the literature [4]. The results indicated that moisture probably weakens the strength of fibers. However, more characterization is needed to corroborate these results. Figure 11 shows the stress at failure of the 17 samples. The Weibull Modulus (β) is 5.96 and σ₀ (η) is 108.22 MPa. Figure 12 shows the Weibull distribution which indicates the failure probability versus stress of the coconut fibers.
Figure 11: The stress at failure versus sample number.
Figure 12 The failure probability versus stress of the fracture strength of the coconut fibers.

Thermal Properties

TGA analysis of the coconut fiber was conducted in air using NETZSH FTA-409. The processing temperature of the coconut fibers, obtained from the TGA curve, was between 140 to 190 °C. Figure 13 shows the TGA curve of the coconut fiber. The first decline on the curve was due to the moisture content of the fiber. The mass loss due to the moisture content was ~ 5% at approximately 100 °C, which is a small endothermic reaction [23]. This TGA moisture result was comparable to the results obtained from the moisture test. The second decline on the TGA curve was due to the degradation of the coconut fiber. This degradation of the fiber happens at temperatures above 230 °C and completes the pyrolysis at ~800 °C. It is observed that the mass of the fiber decreased as the TGA temperature increased and the residual mass of the coconut fibers was 29.99% at ~1248 °C.
Figure 13 Thermogravimetric analysis of coconut fiber

**Fourier Transformed Infrared Spectra**

FTIR spectra in Figure 14 shows absorption bands which are listed in Table 4. Some of the fingerprints found in the spectra were aromatic (1240 cm\(^{-1}\)), -CH- (2940-2820 cm\(^{-1}\), 2840 cm\(^{-1}\), 1151 cm\(^{-1}\), and 880-820 cm\(^{-1}\)), and carbonyl stretching groups (1600 cm\(^{-1}\)). Also, the FTIR reveals that the coconut fibers did not contain contaminants that could jeopardize the bonding properties. The FTIR is a technique used for organic compounds and a good representative of cellulose and lignin are the peaks between (3000-3750 cm\(^{-1}\)), and for hemicellulose it is the peaks between (1830-730 cm\(^{-1}\)) [22].
### Figure 14: The FTIR spectra of the coconut fibers

<table>
<thead>
<tr>
<th>Wave Number (cm(^{-1}))</th>
<th>Functional Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-3750 (3400)</td>
<td>This region is associated with axial stretching of CH groups of cellulose and lignin</td>
</tr>
<tr>
<td>2940-2820</td>
<td>-C-H-, CH(_2), CH(_3)</td>
</tr>
<tr>
<td>2840</td>
<td>Attributed to -CH(_2) groups</td>
</tr>
<tr>
<td>1730-1640</td>
<td>This region can be associated to carbonyl groups stretching from aldehydes and ketones</td>
</tr>
<tr>
<td>1600</td>
<td>Attributed to C=C</td>
</tr>
<tr>
<td>1735</td>
<td>Attributed to ester carbonyl stretching</td>
</tr>
<tr>
<td>1240</td>
<td>This region can be associated with aromatic rings (Ar-O) and could be associated with phenolic groups from lignin</td>
</tr>
<tr>
<td>1151</td>
<td>Attributed to -C-H-, and C-O</td>
</tr>
<tr>
<td>880-820</td>
<td>Attributed to -CH(_2) groups</td>
</tr>
</tbody>
</table>
### Table 4 The functional groups of coconut fibers

<table>
<thead>
<tr>
<th>Wave Number (cm⁻¹)</th>
<th>Functional Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-3750 (3400)</td>
<td>This region is associated with axial stretching of OH groups of cellulose and lignin</td>
</tr>
<tr>
<td>2940-2820</td>
<td>-C-H-, CH₂, CH₃</td>
</tr>
<tr>
<td>2840</td>
<td>Attributed to -CH- groups</td>
</tr>
<tr>
<td>1730-1640</td>
<td>This region can be associated to carbonyl groups stretching from aldehydes and ketones</td>
</tr>
<tr>
<td>1600</td>
<td>Attributed to C=C</td>
</tr>
<tr>
<td>1735</td>
<td>Attributed to ester carbonyl stretching</td>
</tr>
<tr>
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<td>This region can be associated with aromatic rings (Ar-O) and could be associated with phenolic groups from lignin</td>
</tr>
<tr>
<td>1151</td>
<td>Attributed to -C-H-, and C-O</td>
</tr>
<tr>
<td>880-820</td>
<td>Attributed to -CH- groups</td>
</tr>
</tbody>
</table>

Also, The spectra (Figure 15) of the coconut fiber reported in the literature have similar peaks. However, Figure 14 shows well defined peaks which is an indication of the concentrated amount of coconut fiber to KBr (3:100 mg)
Figure 15  FT-IR spectra of nonmercerized and mercerized fibers: (a) nonmercerized coconut fiber, (b) mercerized coconut fibers, (c) nonmercerized sisal fibers, (d) mercerized sisal fibers, (e) nonmercerized jute fibers, (f) mercerized jute fibers [24]

Conclusion
The mechanical, thermal, chemical and morphological characterization of the coconut fiber was studied using the Digital Spring Scale, TGA, FTIR and Optical/SEM. The coconut fiber showed low density and fracture strength when compared to synthetic fiber. However, The coconut fiber could be used for
reinforcement application where high fracture strength in not required but low density is needed in target applications. Also, the moisture content value of the coconut fiber was less than the value found in the literature. The potential of coconut fibers offers great opportunities to replace expensive and environmentally destructive synthetic fibers. Development of a new composite material with coconut fibers presents immense opportunities to use more environmentally friendly materials. Further, developing countries have a great opportunity to take advantage of using natural fibers as reinforcements for polymeric composite materials. Moreover, the coconut plants are harvested yearly and the supplies should be inexhaustible compared to the limited supply of oil reserves from which many synthetic fibers are derived.

References


(24) Corradini, Elisangela, Luis C. De Morais, Morsyleide De F. Rosa, Selma E. Mazzetto, Luis H. Mattoso, and Jose A.

APPENDIX A

Moisture content for the coconut fiber

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Initial Weight (Grams)</th>
<th>Temperature (°C)</th>
<th>Moisture Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0275</td>
<td>0.0268</td>
<td>0.0267</td>
</tr>
<tr>
<td>2</td>
<td>0.0035</td>
<td>0.0033</td>
<td>0.0030</td>
</tr>
<tr>
<td>3</td>
<td>0.0096</td>
<td>0.0092</td>
<td>0.0091</td>
</tr>
<tr>
<td>4</td>
<td>0.0065</td>
<td>0.0064</td>
<td>0.0063</td>
</tr>
<tr>
<td>5</td>
<td>0.0062</td>
<td>0.0050</td>
<td>0.0050</td>
</tr>
<tr>
<td>6</td>
<td>0.0039</td>
<td>0.0037</td>
<td>0.0036</td>
</tr>
<tr>
<td>7</td>
<td>0.0043</td>
<td>0.0042</td>
<td>0.0042</td>
</tr>
<tr>
<td>8</td>
<td>0.0053</td>
<td>0.0051</td>
<td>0.0051</td>
</tr>
<tr>
<td>9</td>
<td>0.0059</td>
<td>0.0058</td>
<td>0.0057</td>
</tr>
<tr>
<td>10</td>
<td>0.0054</td>
<td>0.0052</td>
<td>0.0051</td>
</tr>
</tbody>
</table>

Mean: 5

Standard Deviation: 1
Biography
Jose Estrada is a Senior double majoring in Photography (BA) and Pictorial Arts (BFA). Currently, he is working on his BFA thesis, which he will present to a committee of his professors in the Spring of 2010. His current theme for his work is “Animals like Humans” where he explores the relationship between human beings and their animal counter parts. His passion is to study the animal like humans that roam this land in the endless pursuit of gathering this green vegetation, which is traded for goods and services. Other passions include reading science fiction and pondering the future of humanity as depicted in such stories as, Of War in the Future. He plans to receive his Ph.D. in Art and Visual Culture and/or Art and Professional Practices.
Basic artists: Between the Mirror and the Window

ABSTRACT
The following paper sheds light on two different categories in which artists can be placed in, window and mirror. The window artist’s creation reveals a more external glance towards the world. They create based on what they witness in society and in their external viewpoints. On the other hand the mirror artist looks introspectively into their own thoughts, experiences, and their own emotions to create art. They live and then reflect on their own lives. Furthermore, to exemplify these points I compare Frida Kahlo’s life and work with my own life and work in order to see how two different artists can both mirror their soul into their art. Moreover, it is not to say that all artists must be placed into these two dichotomous categories, but that they can be used to show where an artist derives inspiration. Lastly, it shows how an artist uses the external and internal in their work.

Introduction
In the world of art, there are many categories for artists such as surrealist, cubist, abstract, sculptor, performances and others. As time progresses art from the pre-historic to the modern, critics, art institutions, artists, art lovers have changed the face of art; calling it classical, romances, rococo, surrealism, dada and modern art just to name a few embodiment. All through time, schools of thought and personal dramas separated artists, they were connected not only through the deontological laws of the practice itself but also through the emancipation and regulation of taste as a matter of fact. Thus, new aesthetic systems require new
methodology in fixing the criteria for art appreciation and analysis; for understanding the objects of art and their makers.

One of the fundamental dichotomy in the arena of art theory rests upon the division of artists into two main categories according to the degrees of subjectivity/objectivity or/and emotional versus intellectual within the artistic intent.

On one hand is the Window artist, those who look upon the world, observes and comments on social experiences and society in general [2]. The Window artist sees the pollution, crime, homelessness, injustices and points it out, the Window artist does not close the blinds on the world and cower.

Then, is the introspect artist, or the Mirror artist who looks into the mirror and sees himself/herself in relation to their world. The Mirror artist sees what no other person can possibly see; he/she views and reflects upon his/her own life. The Mirror artist glorifies erotic desires and abandonment; the carnal and spiritual. The Mirror artist translates his/her place in society, sees pain, sorrow and whatever happiness else lingers in the shadows. As the mirror reflects the image of the person, the Mirror artist will translate the image of himself/herself to the work of his/her choice [1].

Through all the recorded history of men, there is a quest to understand the spiritual world and the views of the mind. For artists, the compelling task proved to be reaching into the depths of the soul, pulling out pain, grief, sorrow, happiness, ecstasy, and translating them onto a medium. Our psychological DNA compelled humans to seek out communion with other people. It is the need to connect and reconnect with the spirits of the past and the artistic parts of our nature to communicate with the future.

Over the years I have felt a connection with the Mexican artist Frida Kahlo. Initially this connection had an elegyatic sense to it; Kahlo’s entanglement between the personal and artistic life;
her poetry of love deepened my own sensitivity. I could relate to her grievance over a lost love or an intimate confessant, as well as her social and emotional rejection.

Furthermore, I found similar intellectual motivations that trigger the desire to commit the artistic acts by having used the personal experiences to both fuel and inform the work: the canvas become the confessionary.

In spite of parallels, we have our differences. While Frida is regarded by the artistic community as a surrealist, I regard myself as a spiritual artist. These two terms have different definitions, but in the end, we are related in technique of emotional poignancy for life, have the ability to see oneself in many different lights and how we see are reflections in the mirror. Thus, I think that we belong to the Mirror artist category.

**Surrealist artist: Frida Kahlo**

The Surrealist movement began in the early-1920s, and is well known for its literal and visual production. Surrealist artists and writers regarded their work as an expression of the psychological, open to chance to automatism. The waking dream is part of the surrealist movement. The critics and artists at the time such as Yves Tanguy, Andre Breton, Julien Levy, Pablo Picasso, Wassily Kandiusky, Max Eruat, and Dali are some who considered Frida Kahlo a surrealist painter. However, she did not embrace a similar view of her work. In her own way, she rebelled at the idea of being categorized into a faction of dreamers. She put the matter down simply and directly, by having said that she is not a surrealist; the theoretical and artistic agenda of Frida's work is based upon her emotions. “I think that little by little I'll be able to solve my problems and survive” Frida Kahlo [8]. In this manner of self-discovery, she continually tried to makes sense of her life and
inner-self by exploring what made her: her family, her friends and her pain.

**The thoughts and search for material**

In order to better understand Kahlo’s art/life we need to take a look at both the personal (growing up phases), and the socio-cultural history of Mexico, especially the Revolutionary times. For the citizens of Mexico the start and progressive ideals of the Revolution were the long waited salvation of a country that had been violated, conquered and in constant *feud with itself*. For Frida the downfall of a corrupted government meant two things: First: the government jobs that kept her father employed and his family fed was over. The second effect of the revolution was the influx in the Mexican political and cultural life of European ideology like Communism and Cubism. The new possibly that stray away from traditional beliefs of the living, fueled the drive to break out of Frida’s cultural norms.

As a young girl Frida was often left alone to play, hence her imagination began to grow and bring into existence new possible scenarios. Frida was not accepted by the other children, like in a Carol Lewes story, Frida created her imaginary companions and world of fantasies. Connected with her life of wonders through the imaginary land of possibilities, one could consider this as a first moment of both artistic creation and detachment. With the passage of time she out grew her make-believe friend and found swales in books and study. Her studies led to depicting the form of insects described in her books. From those early lessons, she learned how to draw realistically by doing numerous studies from books and from specimens under the microscopic lens. Not only was she able to observe, understand and analyze the living organism, but she was also initiated in the first formalist issues.
As an adult, Frida was searching for a greater purpose other than the conservative one the of Mexican women, such as staying home, getting married, and raising children, which were expected from her as the second youngest daughter. Frida’s rebellious attitude affected all those who would encounter her and attracted anyone who possessed both brain and spirits.

The Cachuchas was a group of intelligences Frida belonged to, roaming the hallways of the National Preparatory School. Engrossed with the Mexican Revolutions and influenced by her comradeship with the Cachuchas, Frida could picture the structure of her life as it unfolded. Moreover, the image of her new life developed with every idea from authors such as Jules Verne, H.G. Wells, Karl Marx, and also artist from the Mexican mural movement as well.

Frida’s education helped her find new ideas in which to live; it also structured her artwork. Her creative growth was fueled by such ideas as the Mexican revolution, futurism and cubism. Author of her own life, Frida Kahlo would say that her life as an artist did not start until her near-fatal accident, but in truth she began a search for purpose and adventure before the events that led to her bed bound existence. After her initial recovery Frida was bed ridden for months and she passed the time drawing, reading and studying. She drew anything she could see, which included her foot, so upon her request, a mirror was placed on the ceiling of her bedpost. She drew the inspiration and gathered subject matter from her own life, and she mirrored her role in society, culture and the reflection of a stronger confident woman.
The medium of choice

In those early years Frida used her artistic skills in scientific observation and representational drawing. Furthermore, she turned pain into a creative engine, into a tool and source for artistic production. With the image of the positive, strong and confident woman reflecting back in her mind, what she needed then was a surface to lay marks on. Due to injuries Frida suffered, she had a larger amount of time to reflect upon it. Frida did what she loved to do and she studied and copied the great European masters’ style and paint application techniques (such as Durer, Van Dyck, and Da Vinci). Frida used her own image with the aid of a mirror and started to paint on a small canvas, elongating her neck like the one Duerre did and using the similar pose and light like Abraham Angel. Later on in her life, Frida began to develop and use her own style of painting and visual vocabulary.

In the early stages of Frida’s creativity, she found mentors and friends like Diego Rivera, Tina Modotti, Edward Weston, Lola Bravo and others to guide her in finding her own voice. From the exploration of lithograph to watercolor and even fresco paint, by the end of her deeply experienced life, Frida gravitated towards canvas paint and retablo [4]. One of Frida’s strong desires was that of creating and sustaining her affective liaison with the Mexican peasants; with what she thought of to be the genuine gem of Mexican basis. Not only through her cloth selection, but also through her vivid palette and by choosing to paint on retablo or metal plate, she reinforced her personal manifesto. Since retablo was a painting surface that was used to honor different saints of the Catholic Church, for Frida its use had a spiritual significance.

The size of her work had it is own meaning. The majority of Frida’s work was no more than 30 by 40 cm in size. It is my opinion, that if Frida had been able to work in large scale, her work would reflect a direct correlation to the amount of pain she would
want to confess. That is the case of the painting, “The two Frida’s” which was one of her biggest work (173cm by 173cm) reflecting a pond the scale of her emotion after being rejected by “her Diego”; and the connection of being a strong person, but also a woman wanting to be loved [5]. The very emotions described on the surface of her work are the tools Frida used, and is an indication of her being reflected on to her own work.

Use of subjects and the meaning of their role

Life and its pain are the sources of inspiration for Frida; her work reflects the sense of longing for a love that plagued her throughout her career. Each piece has a significant meaning to its position which corresponds to the events of her life.

If we were to look in the mirror long side Frida as she saw “Pancho Villa y Adelita” (see figure 1) being reflected back to her, the viewer could better understand the different elements and their meaning [6]. One section is a scene of portraits of peasants and Mexican bandies crossing the valley of Mexico. In the background of this piece is a snow-covered volcano top and the weather is calm and the sky is semi-clear while reflecting a scene early in the day. The next slice of this painting is a portrait of Pancho Villa wearing a suit and tie with a sombrero. The cubist landscape scene of halls and structures is the last portrait to the left. Apart from the background portraits, the painting has Frida in the middle of the scene smiling and surrounded by the leader of the revolution, visual metaphors for the Revolution’s ideals. Cubism is also a major factor in the piece and the viewer can see it from the frames on the wall to the furniture in the front. An interesting part of the mirror image is the man seated to the front right. This man has no face other than his skin tone. From an on looker point of view, I would say that the man is a symbol of the long lost love she had as a young woman and it can represent the future love that awaits her.
As I studied transfixed upon this early work of Frida’s, I could see the image in the mirror that she may have seen as she stared into the mirror herself. Her being at that moment being reflected and then the experience of being captured for her own purposes. The viewer can peek at the influences that she connected within her culture and her own spirit.

It is suggested by Professor Luis-Martin Lozano that “Pancho Villa y Adelita” is an unfinished work of Fridas. This conclusion comes from a sketch of “Pancho Villa y Adelita” where Frida is depicted with several other figures in the foreground. What drives me to say that Lozano maybe mistaken in his analysis of the piece is that the sketch does not describe all the painted elements of the piece. Frida in the sketch looks lost and sad, also she is somewhat distorted in her poster. Another element that is not in the sketch is the faceless man in the corner. The normal viewer would come to agree with Lozano, if he was not an artist and compare both the sketch and paint side by side. Artists sketches are a marker of the moment and the base from which to jump-off. From that base, she could subtract, add or leave as it is and at times turnstile winds made its own way.

The winds of change disrupted different aspects in life. In the case of Frida’s reflective work, “The Chick” (see figure 2) comes a violent storm that throws the mirror image of oneself off into another direction. In this manifestation, a lilac bush in the center takes up most of the space in the painting, on the bush lies several spiders engulfing the lilacs with there webs and in the midst of the webs are a caterpillar and a larger insect of some kind. Beside the lilac bush is a chick oblivious to the nest of spiders and there meals. There is no information on this painting either verbal or written. Therefore, there are two schools of thought when it comes to this painting [3]. One thought is that this probably symbolizes Frida’s fragile emotional and physical state at the time.
Her failing relationship with Diego, the death of her father, her declining health and pending back surgery all dragging every bit of her strength. In the painting, the chick is being threatened by two spiders and just stands in front of the Lilac bush powerlessly, waiting to meet its destiny. The other school of thought is that the chick is Diego. The chick stands unprotected on a pile of broken twigs and seems to be unaware of the situation. The debris on which he stands symbolizes his crumbling relation with Frida.

Lilac is a flower that symbolizes fidelity. The bouquet of lilacs in the painting is shrouded in the web of spiders so the chick is unable to get them. It is my opinion that the first school of thought is closer to the truth. Frida is reflecting the state of her life through the images, for example her art shows that the chick is unable to be under the protective shade of the lilac bush because of the spider. This represents her spirit weakening from so much grief and her longing to have stability in her life.

Frida put herself in her work, reflecting her emotions and her place in the world. Her work is powerful because of the impression her own soul makes upon the surface of her painting. It is similar to the work of Spiritual artists in the way of expressing the sensation of the world through art.

**Spiritual artist: Jose Estrada**

The spirituality of humanity is tied to belief, faith, and the perceived sense of connection to god. Spirituality in art is frequently expressed by the use of light. I believe that spirituality in art is similar to an epiphany; the perfect balance between the birth of an idea at the intellectual/emotional level with its immediate, physical application onto the surface. Spirituality is seen by some as the personal, emotional experience of religious awe, similar to Nirvana. Equally, important spirituality relates to matters of psychological health. This form of art requires each
artist to peak in his own spiritual fight. As god created human beings in his own image, the artists will create their own reality based on their own reflection. These images spawned by one artist cannot be comprehended fully by only juxtaposing them to the ones made by another artist. However, the ultimate goal is to create a visual testimony of the spiritual connection between the artists’ psyche and the viewer.

**The thoughts and the search for material**

I was born in the 80’s which was the beginning of music videos, it was also the time of the fall of the Berlin Wall and the decade of the great quake that inflicted fear to everyone. In this beginning, I have found life to be a cloudy scene of uncertainty, and it is still a mystery to me where humanity is racing to or from. It is both tragic and comical to realize that in an age with the internet and more information-opportunity than in any other time, people in my own generation seem to be drifting farther away into disconnection and disassociation; into a fast food of emptiness.

The first memory I recall was of a cloudy day, early in the morning when I felt nothing but a cold and sharp pain in between my eyes. The next recollection that comes to my mind is warm orange-yellow light and the warmth of a summer’s day. The only constant theme throughout my life is light and these clouds. I see these spaces and light dance and play with one another all the time and in those moments I feel something that might be called a spiritual experience, It has been the search for reason in the world around me that inspires me to work. Art keeps me still, contained for a moment and it will be the artwork that will end my long staring search in the mirror.

The bulk of my personal, introspective rhetoric gravitates around the question, why create? Why Art? Although the answers are in a permanent flux, the core of the meanings, which lurk
behind my both kunstwollen/kunstmorgen (the art of wanting/the art of being able to) stay the same: working is a manifestation, a product of my soul, my very existence. To create, for me is synonymous with an active and functional presence in and within society and its realm of possibilities. At times, as a quixotic task, I wonder if I could -if not change- at least give through my personal perspective an input upon the surrounding word, upon what life is and could become. To create is to take the hardships; thus, sometimes, I found myself enveloped in cynicism. Questions like art purpose, art consumerism, and art as a social agape generate doubts about what I am thinking as my calling. Thus, sometimes, if I were to subjugate myself to some Dadaist attitude I could say that I allow myself to be fed with social convention, or a set of beliefs which are foreign to me. Then I vomit them back out as meaning of the heart regardless of the turmoil’s and doubts about my art making choice and practice. Therefore, I am in awe to realize that art drives the search for a new way to express changes and dynamics, thus is: life.

**The medium of choice**

Behind a lens and in the darkness, with the smell of acids and base’s lies the starting point of this journey. The tools I used were the perfected way to capture the eyelashes of the sun. I was armed with my camera and film. I captured my rays of light in a can and I needed complete darkness to see my captives. As my interest in art began, the feeling of anxiety bit into my flesh and I needed to be in that darkroom. Moreover, I wanted to be in that small room with sec’s of illumination pounding the gelatin sliver on these sheets of paper. Those images covered in a vial of white began to appear in the chemical solutions. The wet, slick, sheets would need to be plunged into every tray of chemicals, so the invisible image to the eye can be shown to others. These small
steps of creating furthered my interest in art, one failure after another impressed upon me the light of the world developing in a bath of odorous solutions. This way of seeing and expressing is the beginning of my fascination with art.

Time passed and I started collages and began to spot new tools to be used in art. I was scared and was hesitant to use these new tools such as paints, pencils and ink. At first, I found these tools to be cruel devices, created for cave men. I believed that these old time tools were better left for the old masters. I was foolish to be so closed minded; I could not believe that I would be able to create by hand what I could easily do with a camera. It seemed impossible; however, while taking a Beginning Drawing class I had the chance to annihilate the strong misconception that talent is a sort of abracadabra in art making; I concluded that it is an important ingredient, but not the only one. Since then, my both receptiveness, openness to and work ethics have changed. I also expanded my pursuits into a much more multi-axial path-from tool variations into the same media to different medias.

Furthermore, in a progressive manner, I saw that the possibility of one field such as photography can be blended in other fields like painting. In the way of working, I ran back and forth between gelatin prints, large sheet of paper, wire frame and a wooden frame canvas. In this marriage of fields, I can help in resolving my dreams in a solid image to work with.

**Use of subjects and the meaning of their role**

Although I have a strong Mexican heritage, I do not feel that it has a major influence in my work. Since I was born in Mexico but lived for a great deal of my life in the United States, I feel that I share and deny equally the regional characteristics of each of them. I forcefully believe that the mélange between the two cultures thinned the sense of belonging to just one of them. It has
taken me years to understand why I am who I am; to arrive to a sense of identity balance. Thus, my art is about story telling; tales that have gone resurrected and vanished again over time.

The images of a dream can come from life’s little tribulations. Light, as a quintessential devise of the sacred and spiritual of the sublime of quotidian, is one of the pivotal themes/subjects in my work. The light that falls on the field of the photo sanative paper or the glow of a hand set on the table of a hard night of drinks. Many variables make or break a display of a great moment.

The roles of my “Mask Angels Series” served many functions as a group and a tool to search for purpose. In life, there are unfair situations, a love that is lost, cheated, or robbed and some things that are beyond wanting. These series were born from both loss and so much longing for love. The figures themselves are a metaphor for lust vs. love. Each of the poses define a moment of fluid emotion, whatever sentiment and/or meaning will reveal to the onlooker.

In “Fear” (see figure 3) in spite of the narrative aspect of the pictorial space and the linear rendering of it, I intended to operate with the notion of fear itself. In the same spirit with FDR, “the only thing we have to fear it is fear itself”. By creating a nightmare like scenario, I suggest that not only do onlookers fear/react to the figures, but also the figures fears/reacts to the voyeuristic exposure. Therefore, the figure in “Fear” has wings to fly; to escape a situation, and to an extent, to escape every day life. “Masked Angels” is a visual bridge between concepts like leap of faith, unknown and the future.

The human bestiary is at the root of the current series of work, “Animals as humans and humans as animals”. I borrowed from fables, not only their moral/ethic play but also their visual structure. This set of dark humor tells a story about the world that
is through the eyes of the viewer, one line makes up the whole drawing. One continuous line starting from one section of the paper and then running all throughout the surface of the paper creates art. This back and forward rheumatic movement creates a vibration that makes these creatures come to life, and the quality of the line makes the scene wonderment.

In “The Real Bull Fight” (see figure 4), the piece depicts a humanoid bull in the clothes of a bullfighter with his cape. The bull faces the man in normal clothes, but there is a struggle for demonists over the cape. The man on the lower right corner wants the bull to relinquish his power. As the struggle continues, the bull is afraid by the man’s overly aggressive nature and willingness to fight. The animal and man maybe fighting for control, but what the man does not realize is that the bull will attack only to survive, while the man fights for some from of control over everything.

In terms of formalist issues, an important element to this piece and other work is the continuous line. It is the unbroken connection that animals and humans share. We share this world and the gift of life, but also a beating heart. Animals are beautiful and uncorrupted in a way that man can never be; also animals are beings that if given a chance can help in sharing the humans struggle for survival.

**Labeling**

Throughout history humans have been making and labeling the world’s subjects in order to understand the nature of being. It is in the nature of people to put subjects in their place and in doing so humans place things in categories and boxes. It would seem that I am placing all artists throughout time and media into two boxes, but in reality, it is a diagnostic instrument towards understanding the artist. The Mirror and the Window are two states of mind to an artist and it is the jumping point of the creation of an art piece.
The artist has a question in his/her mind and the art piece is the answer to that question. It is the hope that when the product is completed the answer will arrive, the answer to our own struggle, guilt, joy, damage and experience. The goal of an artist in my opinion is to learn and go through self transformations; to have an awakening of the mind in order to get a better sense of this place in which people cohabitate with other human beings. It is in the quest of discovery that the choice between the self and the world comes into play. Does the world matter or does the self-matter? Whatever side the artist unknowingly takes it is for the resolution of the questions they ask themselves and for the ultimate invention that matters.

The path of the Mirror and Window are the starting points to the quest of transformation. These are labels yes, but they are not concrete signs to follow. The difference between the Mirror and the Window is simultaneously nothing and something. The artists in each group may focus of diverse aspects of reality, but each can be interchangeable and often wander between each side throughout their transformation. To take on the job of an artist is to be given a choice unknowingly, artists make this choice, and then he/she picks the media. The artist uses his/her art form to express his/her own thoughts and emotions while translating them into reality. Perhaps, the transformation of the self in art contributes to creating pieces. When the piece is completed, the conversation and a part of that soul will go on after the artist has die. Whether Mirror or Window the most unexpected part to the artist is the conversation between the artist and their piece and between the piece and different viewers. The art will take on a life of its own and the mark of the artist will be felt for as long as there are people to view and to create art of there own.

Artists throughout time both from the past, present and in the future will have to make this choice of paths and its unknown
to artists that these choices exist. No matter what the choice is, the art will forever be changed by the artist’s choice between the Mirror and the Window.

Figure 1
Frida Kahlo
Pancho Villa y Adelita
Oil on canvas

Figure 2
Frida Kahlo
The Chick
Oil on canvas
Figure 3
Jose Estrada
“Fear”
Charcoal
18 x 24 in.

Figure 4
Jose Estrada
“The Real Bull Fight”
Ballpoint Pen
50 x 36 in.
References


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<tr>
<th><strong>Bryan Maurice Flournoy</strong></th>
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<tr>
<td>Major</td>
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<td>Behavioral Science &amp; Sociology</td>
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<td>Mentor:</td>
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<td>Dr. James Lee</td>
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<td><strong>Biography</strong></td>
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<td>Bryan Flournoy is a senior majoring in Behavioral Science and Sociology. He has an interdisciplinary background in Psychology, Anthropology, and Sociology. He has worked as a Program manager for several community after-school programs. As a result, he has become interested in researching social issues surrounding education and inequality. He plans to receive his Ph.D. in Sociology. He has already received admission into Louisiana State University.</td>
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Reforming Student Behavior Using Intervention Programs

ABSTRACT
In this article I discuss the use of intervention programs as a means of reforming deviant behavior among students and report the results of a study in which 5 male participants of a school district intervention program were interviewed, along with their teacher and an administrator familiar with the program. This was done to document their assessment of the effectiveness of a program designed to reform deviant behavior. The program removes students from their regular classroom to a strict disciplined environment on a separate campus, where a Skinnerian approach is used to reform their behavior. While interviewees reported improved grades and a reduction of misbehavior while being in the program, the teacher in charge of the program reported high non-graduation and drop-out rates among students once they left. This study raises questions about the prudence of removing deviant students from the classroom in order to reform their behavior.

Introduction

Dealing with Deviant Students
The collective-resource perspective views deviant students as a “product” of the social organization of the classroom and as a potential asset for maintaining control of the classroom by acting as examples for non-deviant students of what behavior is unacceptable. However, traditionally, deviant students have been viewed as a detriment to classroom order. Students who are considered deviant regularly require disciplinary action from teachers and administrators. It has usually fallen on teachers to
maintain discipline and order in the classroom, and they must use considerable amounts of classroom time doing so (Gottfredson, Gottfredson and Hybl, 1993; Stevenson, 1991).

Disruptive behavior by deviant students in school harms both the misbehaving individual and the school community. Students who regularly engage in behavior that warrants disciplinary action by teachers and administrators are more likely to drop out of school, use drugs and alcohol, and engage in delinquent behavior. They are also more likely to make poor occupational and marital adjustments later on in life (Gottfredson, Gottfredson and Hybl; 1993).

Many of the subjects that I interviewed for this study reported that schools in their district were eager to rid themselves of deviant students. The disciplinary action that deviant students receive is typically in the form of referrals to the office and suspensions, both of which remove the student from the classroom and from instruction (Gottfredson, Gottfredson and Hybl; 1993). This is an example of the problem deviant students can cause for schools and school districts. Schools’ attempts at disciplining a student can also deprive them of instruction.

Removing a deviant student from the classroom removes the possibility of the deviant student being a further detriment to maintaining classroom order, but also prevents the deviant student from participating in the classroom and being instructed. Stevenson (1991) argues that removing deviant students from the classroom precludes any possibility of using them as an asset to maintaining classroom order. If a deviant student is not present they cannot be punished and act as an example to non-deviants of what behaviors are not acceptable, and what will happen to them if they engage in these behaviors. A good means of dealing with deviant students
should be maintaining classroom order without depriving deviant students of equal access to instruction.

**Intervention Programs**

Intervention programs are broad attempts at modifying behavior or improving overall performance among a particular population. Typically these institutions use intervention when they seek to resolve certain issues they believe are serious enough to warrant action. There are many examples of intervention programs being used by institutions like municipal governments, schools, prisons, and corporations.

One example is a seven year study of the City of New York’s effort to reform its high school system. The study documented the City’s unique introduction of reform-oriented “small schools” as a way of reforming the “factory model” that New York perceived their schools to have. Despite these “small schools” serving a more educationally disadvantaged population of students they produced lower incident rates, better school attendance, improved academic assessments, higher graduation rates, and higher college attendance. The researchers cite the features of these small schools as the reason for improved performance among students (Darling-Hammond, Ancess, and Ort; 2002).

**The Use of Intervention Programs to Reform Deviant Student Behavior**

A 3-year study by the University of Maryland and John Hopkins University found that programs designed to improve school conduct amongst middle school students caused conduct to improve significantly when the components of the program were
well implemented. Their program included school, classroom, and individual level interventions aimed at reducing misbehavior (Gottfredson, Gottfredson and Hybl, 1993).

The programs were necessary because the state government changed their education policy. The policy change resulted in a much higher number of students being held back from advancing to the next grade. A spike in misbehavior followed, and raised suspension rates from 41 percent to 100 suspensions per hundred students. The increase in suspensions resulted in a serious loss of instruction days for students who could not afford to fall behind any further than they already had. Their intervention program was implemented to reform the large number of students that had a diminished investment in education by revising discipline policy, tracking behavior, bringing parents into the discipline process, changing classroom organization, and positively reinforcing students (Gottfredson, Gottfredson and Hybl, 1993; page 4-5).

Where there was a high implementation of the different components of the program there was an improvement in classroom orderliness, and in the teachers’ perception of their students’ behavior. Also, twelve of the thirteen outcome measurements used to track the program’s progress showed improvements in the positive direction. (Gottfredson, Gottfredson and Hybl, 1993; page 18, 19)

The results of the 3 year study support the possible validity of using intervention programs as a means of reforming student behavior (Gottfredson, Gottfredson and Hybl, 1993; page 31). However, the intricacies of intervention programs are not fully understood, especially since intervention programs tend to vary depending on which institution they are meant to serve. For
example, intervention programs designed to reform deviant students at one school may be very different from those designed to reform deviant students at another school.

This paper will specifically focus on an education intervention. Acceptable behavior must be encouraged and deviant behavior must be discouraged in order to provide an environment suitable for learning. School districts are willing to spend a considerable amount of resources on administrators and programs to respond to students who engage in undesirable behavior. One way to address students who become behavior problems is to enroll them in intervention programs.

An intervention program can take many different forms, but school intervention programs are mostly designed to resolve behavioral issues and improve classroom performance among students. School districts hope that if intervention programs are able to serve their purpose they can allow school districts to resolve issues of behavior without having to remove students from instruction.

**Methods**

The purpose of this study was to collect qualitative data on a school intervention program designed to reform deviant student behavior and improve classroom performance. Students, their lead instructor, and a district administrator were interviewed. This study was designed as an opportunity for those who are participants and/or most familiar with the program to describe, in detail, their attitudes toward the program and evaluate its effectiveness as a means of reforming deviant student behavior.

Students, a teacher, and an administrator of a district program in the San Francisco Bay Area were chosen as the
subjects of the study. The subjects of this study were chosen because they are either in, or very familiar with, their district’s intervention program. The district’s intervention program is called the District Alternative School, and is an example of an intervention program that attempts to reform deviant student behavior. Their perspectives are important in determining the overall effectiveness of these kinds of programs, and what type of effect they can have on individual students.

Their intervention program, which is officially called ‘the District Alternative School’ and will be referred to as ‘The Program’, removes students from their regular campus to an offsite location where they attend class with other deviant students. The students must complete school curriculum within a high stakes disciplinary environment, as the Program represents the last chance for a majority of the students to avoid expulsion.

Their district’s superintendent was contacted, and provided a letter from the district giving permission to conduct this research. The students, the teacher, and the administrator that were interviewed for this project were chosen based on their availability and willingness to participate. The teacher and administrator were required to sign a consent form before they were interviewed. In the case of students, a signed consent form from a parent or guardian was received before the student was interviewed.

One of the portable classrooms on the Program’s campus was chosen as the site where the interviews were to be conducted. The Program’s campus is located between a school site and a Boys & Girls Club of America. There are two portable classrooms and an area of blacktop, outlined in white paint and surrounded by a wire fence, which makes up the Program’s campus. Behind the campus there is an active construction site where a community center is being built; the noise from construction can be heard even when inside the classrooms.
Each subject was interviewed for thirty-minutes while the other students continued instruction in the adjacent classroom. Each subject was asked a series of structured questions (See Figure 1A) and a series of open-ended, follow-up questions based on their responses. Each subject’s response was documented in hand-written notes.

I intended for these interviews to take the form of open-ended conversations instead of structured interviews in order to prompt the subjects into being candid about the Program and their attitudes toward it. A description of the response each subject gave during their interview is included in the following section of this article. Some subjects were more forthcoming or eloquent than others; this is why the length of each description varies. Pseudonyms were used for each of the subjects to protect their identities.

Results

Ms. Howard

Ms. Howard, who is a district liaison in charge of managing student needs, and ensuring that they are aware of and can take advantage of the district’s resources, described what role the district expects the Program to play. She explained that the district technically identifies the Program as a District Alternative School. It is designed to service students who have been continually disruptive, involved in assaults, or have been in possession of drugs, alcohol or firearms on campus. The Program also services female students who are pregnant or any student the district describes as “overwhelmed”.

Ms. Howard said that the Program’s main purpose is to give a second chance to students by allowing them access to “differentiated instruction” while still allowing them to complete the same curriculum they would receive at their home site.
“Differentiated Instruction” refers to the environment students have access to when they are in the Program. Each student uses the same books and has the same assignments they would in their regular classroom. However, in the Program, they get the benefits of a classroom that attempts to address any issues that may be preventing them from reaching a certain potential.

Ms. Howard said the Program is limited to servicing about 28 students at a time; with two teachers, a psychologist, and a counselor to aid the students. Under the close supervision of the staff the students are closely scrutinized and are rewarded or punished for every behavior. She explained that the district’s hope is that the smaller classroom environment and the presence of more adults allow the faculty to address any unsatisfactory behavior the student’s exhibit, and reward every student’s success. Parents are required to attend regular meetings, and be integrally involved in disciplining. The students start school an hour earlier than they would at their home site, and are not allowed to leave until they finish their homework.

According to Ms. Howard the district believes the Program to be a success. She elaborated saying, “The kids say they like it…it’s the smaller class sizes, and the fact that they get two teachers that they have connections with.” She also said that students who graduate the program are monitored by their Program counselor to aid in their transition. She also cited the improved academic performance among students and the small number of repeat offenders as a sign of the Program’s success.

Miss Conner

Miss Conner is the senior instructor within the Program. She was asked what she felt the purpose of the program was. She gave a two part answer;
Initially the Program was supposed to help teach these kids life-skills. (But now) we get students that (the) schools are sick of... the class clowns and the kids with no family support.

Miss Conner described receiving pressure from the district to help reform a particular student’s behavior but only being given vague “generalizations” about what that student’s issues may be.

When a student is admitted to the Program the staff is given a behavioral report, which she described as being a list of incidents. They contain the number of referrals to the office that student has received (or whether they have been expelled), vague information on what incident the student received those referrals for, and how many times that student has been suspended, given half-days, or put on independent study.

Miss Conner explained that the staff is given the responsibility for reforming students who have been continually engaged in deviant behavior without knowing what measures have already been tried to reform that student in the past. She claimed that the lack of this information leaves the entire staff at a disadvantage because they must start from “square-one” with each student.

When asked whether the students’ attendance in the Program was a punishment or an opportunity for students to reform themselves Miss Conner said that it was definitely punitive, but that the staff is trying to change that perception among administrators and students in the Program. However, she did emphasize that the Program can be a very good opportunity for students to learn the skills they need. Miss Conner explained that it is her role, as well as the rest of the staff, to prepare students to return to their regular classrooms by teaching them organization, conflict resolution, and especially to ask for help.

Miss Conner said that the Program has a good graduation rate, meaning that almost all the students make it out of the Program and
back to their home sites. However, Miss Conner explained that, while after graduating the Program students have improved classroom behavior and slightly improved academic performance, most of her students do not graduate the eighth grade or drop out of school in the ninth grade. She said though they talk about college and future success as a part of their curriculum, the students typically don’t believe college can be in their future.

_**Eric**_

Eric was referred to the Program after a sexual harassment incident at his school. After being expelled, it was suggested to Eric’s mother that he attend the Program, or face continued expulsion. Though he later explains the Program is designed to be a six week program he has been in the Program for 2 years. He has been attending the Program longer than any other student so far.

When asked what he felt the purpose of the Program was, Eric said it was to teach the students how to control their anger. He explained that a majority of the students in the Program had difficulties with anger. When a student did not understand something being taught to them or how to complete an assignment, they would get frustrated and angry. Eric said the teachers in the Program teach them how to control that frustration and ask for help.

Although he believes the Program is designed to be a punishment, he says he uses it as an opportunity to better himself. He said he has made it his own personal challenge to increase his patience and to conquer his anger issues.

Eric emphasized that discipline is a very important issue that the Program has to deal with. “Nobody wants to get in trouble,” Eric explained, “It’s what we spend a lot of time thinking about.” He described the atmosphere within the Program as strict and added, “We are punished or rewarded for every behavior.” One
part of maintaining discipline in the Program is the Class Chart that is posted on the whiteboard in their main classroom. It is a cardboard stoplight with a red light, yellow light, and green light; and numbered from 10 to 0, top to bottom.

According to Eric’s description, when a student misbehaves they are given the choice to be “Moved Down” the chart or do 10 push-ups. A student can also be kept until 4:15, this is a punishment because students are usually allowed to go home once their homework is completed, which generally doesn’t take until 4:15. If a student moves down the chart to 0 they are suspended. If a student is suspended more than 3 times then they face expulsion.

Eric said that good behavior has earned him incentives like being able to go to the nearby Boys and Girls club, or go to Seven-Eleven. However, the most important incentive is Earning Weeks. Eric explained that for every week a student can maintain a position of 7 or higher on the Class Chart, that week is added toward the six weeks a student needs to graduate the Program. Eric has been in the Program for 2 years without earning his six weeks.

Nevertheless, he has seen others graduate the Program. Eric said that during the previous school year there were 34 students that were in the Program, 10 students graduated and transferred out; out of those 10 students, two returned to the Program.

When asked whether he felt the Program was effective in accomplishing its goal Eric said that it was. He said he had learned skills in the program that have helped him resolve issues with his counterparts and learn to ask questions when he does not understand something. However, Eric said that he thinks the Program is just temporarily restraining his bad behavior. He said, though he is eager to go back to his home site to be with his friends, that if he left the Program, “It’s gonna comeback.”
Adam

Adam was transferred to the Program after a fight with another student. He also vaguely made reference to some other incidents that he had been involved in before the fight, but said they had never been anything serious.

He said he was suspended for two months before his principal told his mother he had to go to the Program. He had never heard of the Program before he was transferred. He attended school in a completely different district outside the city and now commutes on the city bus more than 15 miles to get to school at the Program.

He has to wake up at 4:30 every morning to get to school on time. Adam expressed outrage about having to attend school so far from where he lives. He reiterated loudly, “I don’t even live here! Being here is like being in a dream…I just wanna wake up.”

Though he has only been in the Program for 3 months he has seen one student transfer out so far. He averages an 8 on the class chart, but has earned two weeks. He said his grades have improved and feels the program is trying to teach him “how not to do bad things.” When asked how he feels about being in the Program, he said, “Lucky.”

Jay

Jay says he averages a 5 on the Class Chart. He was suspended the last month of the previous school year and spent the summer expelled. He has been in the Program for 3 months and had earned 3 weeks but an incident in which he used inappropriate language toward a teacher caused him to lose all 3.

He described himself as the type of student that, “got referrals all the time”, but now he does better. He says he still gets in trouble and has had to be punished by the Program staff several
times. He said that his detentions have decreased over time, and that he is learning to be more respectful.

He described the Program as a place with little freedom where he has to do his work. Jay says his improved math and writing skills are a direct result of being in the Program. He cited one-on-one help from Ms. Connor as a major reason.

Aaron

Aaron was referred to the program after being caught in possession of a knife and a lighter at school. He has been in the Program for 9 months. He spoke at length about his fear of the Program before he came. He said his principal had threatened him with being transferred to the Program for smaller incidents, and he had heard the Program was full of gangsters, so he was reluctant to come.

Aaron described his surprise at how much the other students focused on their work and how the staff maintained a strict environment. Aaron said he quickly adjusted to the classroom because it was less rowdy than his usual classroom. He said it is different out on the blacktop during lunch. There are frequently fights or altercations and the yard-duties do not maintain the strict atmosphere that the Program staff does. He said he desperately misses being at his home site, and wants to go back, but for now he is working on how to control his “bad judgment.”

Roger

Roger frequently scored a 5 on the Class Chart. He said that if a student is below a 7 they have a hard time Moving Up. He says he was frequently in trouble at school before he entered the Program because people “annoyed” him. However, he now feels he is learning how to ignore the “annoying” things people do to him.
He said that he looks out for many of the other students in the Program and that is why he has been Moved Down or gotten in trouble, but that most of the time he has been rewarded for his actions. Roger said that the Program has given him an opportunity to learn how to deal with people.

Roger explained that, though he hopes he can get out of the Program, to see his “real friends” he does not expect to anytime soon. He has earned 2 weeks in the 3 months he has attended the Program.

Discussion

What is the goal of the District Alternative School (The Program)?

The Program is designed to be another option for administrators when dealing with students whose behavior requires consistent disciplinary action. Disciplinary action, like referrals, suspensions, and expulsions, act as a punishment, but also deny students access to instruction. The Program is seen as a disciplinary option that does not reduce the number of instruction days students receive.

However, it is important to point out that there is a stark difference between the goal of the program and how it is used by the schools. While the Program may be designed as a means of earnestly trying to encourage good classroom behavior, the Program is, in practice, used as a penitentiary system for the district. Students are sent for bad behavior, removed from the wider population of students until they are able to prove to school authorities that they are fit to become productive members of the school community again.
Is the District Alternative School (the Program) accomplishing its goal?

From the perspective of the school district, the Program has been effective. The majority of students that enter the program return to their home sites and are involved in fewer incidents warranting disciplinary action. There is less pressure on the schools to deal with discipline problems, and students who were on the brink of expulsion get to remain in the district.

However, it may be valuable to question the scope of the Program. The high drop-out rate among former Program students suggests that even though these students have reformed the behavior that caused them to receive regular disciplinary action, they have not reformed the behaviors or issues that prevented them from succeeding as model students. Three out of five of the students interviewed were below a seven on the chart, and three had earned no weeks after more than 3 months in the Program.

Several students said that at their home sites the Program was definitely considered a punishment and that they had even been threatened with it on occasion by administrators. According to Ms. Connor, teachers and staff are expected to reform students that display unacceptable behaviors but are not given what they need to deal with the more complicated personal issues that may be the underlying cause of those behaviors.

All of the students interviewed expressed both a longing to return to their home sites and a focus on resolving issues they felt they had. They are using it as an opportunity to improve themselves. Some expressed anxiety over leaving the Program. Eric has been in the Program his entire middle-school career. Adam is a student from another district and another city and he attends the Program, though it was never designed to service him and yet he feels “lucky” to be there.
All of these are examples of how the Program has grown to serve a purpose beyond its design, and some problems that exist as a result. As a district institution the Program is both used and viewed in many different ways. Though it may be accomplishing its goal, the role it plays within the school district may not be what was originally desired by the administration. If the Program is not contributing to the overall success of each student then the district may want to address that issue.

Conclusion

This study outlines how a school district attempts to use an intervention program to reform deviant student behavior. Similar to the Gottfredson, Gottfredson and Hybl study, the teachers and students in our study reported improved student performance as a result of intervention (Gottfredson, Gottfredson and Hybl; 1993). However, it was discovered that in this particular case the intervention program was not always used for the purpose it was created. It may also be true that conflicting views shared by the administration, students and teachers, on what the scope of the Program should be, play a large role in how the Program is actually implemented. Failure to recognize these issues may have unintentional consequences that put certain students at a disadvantage by acclimating them to a supportive disciplined environment that they will not have access to once they leave the program.

Also, the schools in the district may be using the Program in its current form to cast out undesirable or deviant students. Doing so can be detrimental to the deviant, but also to the classroom according to the collective-resource perspective as described by Stevenson (1991), who argues that deviants are products of the social organization of the classroom and can be potential assets in
the maintenance of classroom control. Removing deviants from the classroom and placing them in an intervention program removes any potential of them being assets to orderly classrooms. It may, in fact, make them grow accustomed to a strict environment that is more nurturing and disciplined than the standard classroom in their district. As a result they are not prepared to deal with a classroom setting, in which they receive a fraction of the support and structure than they did in the Program.

Much of the support students receive in the Program reflects the kind of support that should be readily available at every school in their district; and, as is reported by Gottfredson, Gottfredson and Hybl (1993), the cost of doing so is not unreasonable. If the conditions that produce improved academic performance and behavior in the Program were applied universally in the district, there may not be a perceived need to remove deviant students from the classroom.

The Gottfredson, Gottfredson and Hybl study was an example of how overall classroom performance can be increased and deviant behavior decreased without removing deviants from the classroom. This raises new possible research questions about the possibility of many of the characteristics of the Program being applied to reform the classroom district-wide and what effect that may have on classroom behavior and deviant students.

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Esther Azizi, Pazit Flint, Siegal Sadetzki, Arie Solomon, Yehuda Lerman, Gil Harari, Felix Pavlotsky, Avraham Kushelevsky, Ronen Glesinger, Esther Shani and Lior


Biography
Carol M. Funes Dimas is a Senior Electrical Engineering student. She is currently focusing in communications. Inspired by a Salvadorean telethon, she dreams of helping children who are in need of prosthetics. The telethon is a yearly show in which people donate money to children who are physically challenged. Because of this passion she plans to pursue a graduate degree in Biomedical Engineering.

Carol M. Funes Dimas
Major
Electrical Engineering

Mentor
Robert H. Morelos-Zaragoza

GSM versus CDMA:
Data Transfer and Power Control Analysis
ABSTRACT
In today’s cellular market there are two main types of network technologies: GSM (Global System for Mobile telecommunications) and CDMA (Code Division Multiple Access). There are many functions that these two technologies provide, however, in this paper we will be discussing only two of them. The two functions are data transfer and power control. Data transfer is important in a system as it determines how fast the system functions. Power control helps in reducing interference between different users in the networks. After comparing both networks it is found that the CDMA technology has faster data transfer. After careful research it is found that power control has better use in the CDMA network.

Introduction
GSM stands for Global System for Mobile telecommunications and CDMA stands for Code Division Multiple Access. GSM and CDMA are two distinct types of network technologies. These technologies are used to send digital signals over air waves. The dispute between these technologies is commonly seen in wireless phone services. Although there are more types of systems for cellular communication, these two are the most dominant examples. Many times consumers are oblivious to the difference in these two systems. This paper will look further into the basic differences and compare the data transfer and power control of the two networks. Data transfer is important to the consumer because it allows them to know which network functions faster in terms of the data services offered by cellular companies. Power control is also important as it shows how much interference
can be found in the network. In order to perform a comparison of these two systems we must first have a clear understanding of the performance of each.

**GSM Basic Overview**

The Global System for Mobile telecommunications (GSM) is a system that is used in many parts of the world although it was first established in Europe. The first generation of digital cellular communications was introduced by a company called Qualcomm. It began as a result of requirements set forth by the Cellular Telecommunications Industry Association (CTIA). At first Time Division Multiple Access (TDMA) had been adopted as the standard, however Qualcomm came up with a system that was compliant to the requirements set forth by CTIA.

The GSM system uses cellular frequency reuse. This is a phone network that first assigns different frequencies to adjacent base stations (BS) and then reuses them in a pattern of areas. Let us for example take a closer look at Figure – 1. We can see that there are X number of areas. These non-overlapping areas, called cells, are assigned in a repeated pattern to a hexagonal grid. X can depend on many factors some of which include local propagation environment, which also

![Figure – 1](image-url)
determines the interference that is received from neighboring cells and traffic distributions. Reuse distance, which is the distance permitted between cells using the same set of frequencies is dependent on the interference received. In order to reduce the interference transmitted through adjacent cells two methods are used. The first method involves the assignment of a set of frequencies to the base stations. Secondly, these frequencies are reused according to the design. The higher the value of X the greater the distance between two adjacent base stations with like frequencies.

The greatest factor in the determination of the cell size is the demand. When there is a high demand the cell has to be smaller. The reason for changing the size of the cell is fewer frequencies are assigned to adjacent base stations. The reuse factor determines the spectrum efficiency in the systems. There is higher frequency efficiency when the reuse factor is smaller; hence the cell size is also smaller [1].

In order to fully understand how the GSM system works, it is important to understand the functioning of the radio channel structure in GSM. The radio spectrum is limited and thus it must be divided in a way that allows the maximum number of users. GSM uses a technique in which both the frequency and the time domain are implemented. It is for this reason that (Time Division Multiple Access (TDMA) and Frequency Division Multiple Access (FDMA) are used in GSM.

The frequency band of the GSM system consists of two 25-MHz frequency bands. The first band carries frequencies from 890-915MHz. This first band transmits information from the mobile transmitter to the base station receivers. The second band of frequencies carries range from 935-960MHz. This second band transmits from the base stations to the mobile receivers. These two bands are once again divided into 25 channels with a bandwidth of
200kHz. Eight TDMA non-overlapping slots are further created. The technology used for GSM is very similar to that of TDMA. In TDMA each channel is only assigned 3 slots as opposed to the 8 slots of GSM. Eight different time slots are assigned a frame duration of 4.615 msec; each slot has a 0.577ms length. The frame consists of the 8 slots. In Figure – 2 we can see the basic GSM frame structure. A physical channel is defined by recurring time slots. The TDMA with eight slots are the basis for multiframe structuring. Here channels are assigned to logical channels. Two different frame structures have been established for network control. The first structure consists of 26 time-frames and the second structure consists of 51 time-frames. The structure of the GSM frame can be seen in Figure – 2 [2].

Figure 2 – GSM Frame Structure [2]
**CDMA Basic Overview**

The Code Division Multiple Access (CDMA) system uses spread spectrum communications. Spread spectrum is a way of transmitting radio signals over radio channels. The channel that is used is much larger than is needed to transmit the signal, so interference with other users that are in the range of the bandwidth is very small. Each user is given a distinct code sequence in CDMA. The receiver is able to decode the transmitted signal in order to have the original signal. This means that if two users transmit signals at the same time, the receiver is still able to distinguish between the two because of their unique code. Since the bandwidth is much larger than the transmitted signal, the process of encoding spreads the signal. Interference levels vary depending on the number of users accessing the channel in a period of time. Therefore, if users are only accessing the system for a short period of time, more users can be added to a particular bandwidth. This is convenient because the system does not have to be reorganized to add or to subtract users.

Spread spectrum communications have two different ways of being accessed. One method is called code division and the second method is frequency hopping. The frequency hopping method allows mobile radios and radio channels to be shared. Radio channel frequencies are transmitted for short periods of time and later hop to other channel frequencies in order to continue the transmission. That is why it is called frequency hopping. CDMA uses the code division spread spectrum communication, because it has a large frequency bandwidth compared to the radio signal that is used. This allows many users to use the single radio channel frequency and it also creates its own distinct code sequence [3].

As previously mentioned there are two ways to send information in CDMA. The transmission of these signals use the
DS spread spectrum that was mentioned previously. First you send the information from a base station to the receiver with a bandwidth of 1.25MHz; this is called forward link. Secondly, you send information from the mobile receivers to a base station with a bandwidth of 1.25MHz; this is called reverse link.

In order to describe the function of the forward link it is convenient to first understand the importance of CELP coders. CELP stands for Code excited linear prediction and it is a speech coding algorithm. CELP works with the signals from the voice of the user. The voice generates data that must then be encoded at a certain rate depending on what the rate the data is being generated. For example, when the rates of generation are about 9600 or 4800 bits per second, then the encoder rate is one half. It is important to maintain a bit rate of 9600 bits per second. Since the rate of generation depends on the speech, if the speech activity goes down, then the encoder rate must also go up.

Block interleavers accept sets of symbols and rearranges them. The encoded information previously mentioned is passed through a block interleaver, thus reducing errors in transmissions. At the output of the block interleaver, the data bits are mixed up and then multiplied. The multiplication is implemented by a code generator which produces a code that identifies a call.

Hadamard is a sequence that has a total length of 64 and is given to each channel. Each base is assigned 64 sequences and so there are 64 channels. An example of a sequence is one which has all zeroes. This sequence is used to send a signal that intrn measures the characteristics of the channel such as the strength of the signal and the carrier phase offset. Other sequences are also available and may be used to time synchronization. There are 61 channels that are used for users. This sequence is used to create an identification of the users that can be seen by the different offsets.
The second way to send information is called reverse link. The modulator from the transmitter to the base station is different than the one previously mentioned. Here, there is more interference between users because the transmitters are not synchronous and they are operated through batteries and so have a limited amount of power. Because of this problem there is something called rate convolution code used. Here the gain is higher and when there is low voice activation, then the bits from the encoder are repeated two, four, or eight times. Here, the code bit rate is 28.8 kbits/s.

Hadamard sequences are also used in reverse link. It is used to modulate data by using 64 signal sets with a length of 64. A 6-bit chunk of data is placed on the Hadamard sequence resulting in a bit rate of 307.2 kbits/s that shows up at the output of the modulator.

Because there is more interference in reverse link, the code symbols at the transmitter are set to random. This means that when there is lower speech activity, the bursts are not spaced equally. A burst is an amount of data received in one operation. The gain here is small compared to the forward link [2].

**Data Transfer**

GSM and CDMA both have different technologies that they use for data transfer. Data transfer is important now as phones have many applications such as text messaging and games. The technology that GSM uses for data transfer is called EDGE (Enhanced Data for GSM Evolution). The technology that CDMA uses for data transfer is called EVDO (Evolution Data Optimized).

In systems such as the GSM cellular it is know that for every user there is a different channel quality that affects data transfer. Some of these differences are affected by the distance to the base station or interference. In order to have a good speech quality there must be a certain signal-to-interference ratio (SIR).
When this ratio is below this ideal number, then quality is poor. When the ration is above this ideal number, then quality is good. The radio network is the one that must work in order to make sure that few users have low SIR’s. This is necessary to ensure a large number of users will have SIR’s above the ideal number. However, the SIR can be so high that there is exceptional channel quality that is of no benefit to users. The EDGE technology is made in order to help with this problem by using something called link quality control; this modifies data to the channel quality in order for there to be a desired bit rate. EDGE quality increases when the channel quality is increased. This technology was made to allow large amounts of data at high rates of up to 472kbps. Some of the speeds that are expected for users are in the range of 80kbps to 130kbps. EDGE also provides 384kb/x of data services. In order to implement this system it is necessary to add a transceiver to each cell. It will also support high data rates in downlink receivers, meaning that the data rates can be sent and not received. Others will need to be supported through uplinks and downlinks, meaning that data rates can be sent and received [4].

EVDO is a standard for high speed wireless broadband and is associated with CDMA technology. EVDO technology is designed to provide high-speed mobile data by functioning with a high spectrum internet data service in mobile networks. Code aggregation is what allows high speed services. This is done by sending a maximum of eight codes that are assigned to high speed packet data compatible mobile. This service is made between the mobile and the internetworking function (IWF). When the phone requests higher data rate packets, then the phone must also provide a number of code channels. When this information is received, then the maximum number of codes is sent to the phone. A fundamental code channel is also needed to send the high speed packet data. When higher rates are needed then there needs to be more code
channels added. For high data rates there needs to be a wide channel bandwidth of 5MHz. The data rates for EVDO are from 9.6 kb/s to 2 Mb/s. These rates are supported by supplemental code channel (SCC); one SCC is given to ever data service. EVDO has 1.25 MHz frequency band that allows for increasing the capacity and allowing data rates higher than 144 kb/s. An advantage of the EVDO system is that it uses the same frequencies to broadcast as do the already existing CDMA networks. This is important to cellular companies because it decreases the expenses of creating and using new networks; this is so since buying spectrum frequencies is very expensive [7].

Power Control and Interference

Power Control in GSM and CDMA is an important technique to look at when comparing the two systems. This technique’s purpose is to reduce the overall interference. In power control the power that is transmitted from the cellular device is regulated in order to obtain idealized signal strength. The signal strength can vary depending on the distance of the mobile from the base station. Also, a reduction of interference can occur as a result of high speech quality. As a result, battery consumption decreases. Although power control is used uplink and downlink, the main principle is equal.

Power control in GSM enhances the transmitted power. By using power control techniques, power radiated is minimized. Interference from other users and channel conditions do not affect the overall power control. In the current technique used some users must have worse quality than other users in order for the overall system to function properly. It is also important to note that with the GSM technique used, all users use the entire bandwidth; they use the bandwidth at different time slots and frequencies.
In order to reduce interference a technique called Dynamic Power Control is used. This technique is used from the Base Transreceiver Station (BTS) to the Mobile Station (MS). This algorithm uses two variables called rxqual and rxlev; they stand for received quality and received signal strength. Their function is to adjust transmitted power. When rxlev is increased or decreased from the thresholds then the power coming from MS and BTS decreases or increases. There is no variation in power, however when the received power is between the two thresholds. If rxqual is increased or decreased from the threshold, the power of MS and BTS also increase or decreases. There are two thresholds for uplink and downlink for quality and signal strength. Some cellular companies have two thresholds in order to increase and decrease power. Other cellular companies have one threshold for either power increase of power decrease. The same result is achieved for both methods. By reducing the overall power of the system, the co-channel interference is also reduced. Identical to GSM all CDMA users use all the bandwidth, however CDMA uses the same frequency spectrum. Because all users have the same frequencies, users must be identified by codes. The limiting factor in CDMA is interference; this factor is minimized with power control. Different techniques are used for power control in order to manage transmitted power from bases stations to cellular phones therefore reducing interference and increasing the battery life.

When power control is not taken into consideration, all cellular phones send signals with the same power and are not concerned with the distance from base station. Therefore, the phone far from the base station will have high interference due to the closer phones distance to the base station; this is called the near-far effect. Power control manages interference by controlling the power of the cellular phone and frequently adjusting the transmitted power.
The individual transmitted power of each cellular phone must be decreased in order to reduce interference. This also means that the signal to noise ratio has to be maintained a value so that the call quality is still good.

**Conclusion**

In this paper there were examinations of two types of cellular technologies: GSM and CDMA. We can see that the main difference in the way the technologies function can be found in the way the signals are divided between users. GSM uses TDMA technologies in which channels are assigned to local channels after time slots have been assigned. CDMA uses a different method in which spread spectrum is used; here radio signals are sent over radio channels. Data transfer in both technologies was also compared. GSM has a speed of about 384kb/s while CDMA has a speed of 2mb/s. From the findings, one can conclude that CDMA has a faster data transfer. Power control was also researched. It was found that power control is much more important in CDMA than in GSM. If power control techniques are not used in CDMA, there will be high rates of interference. Once this power control technique is used however, the spread spectrum technology used in CDMA allows for higher capacity than that of GSM, hence it can be concluded that CDMA has better use for power control.

**References**


Julia Gonzales
(McNair Cohort 2001)

Major
Sociology

Minor
Psychology

Mentor
Dr. Steven Milner
Wayne State University

Biography
A native of San Jose, California, Julia M. Gonzales is a recent graduate from the Pepperdine Graduate School of Public Policy, with a dual concentration in economics, and state and local policy, with an emphasis on social policy and education. While an undergraduate, Ms. Gonzales served as Representative Dennis Cardoza’s Congressional Hispanic Caucus (CHC) Liaison as well as policy analyst for social legislation related to education, healthcare, housing, the impact of technology, and children’s foster care and adoption. She also researched and briefed the congressman on matters related to government reform. Ms. Gonzales currently works at UCLA, as the Assistant Director of Federal Government Relations. In this capacity, she is responsible for developing strategic plans to promote UCLA's research, teaching, and public service missions at the federal level.

Resiliency A
Psychological Analysis of
the Life and Times of
Cesar Chavez
**Resiliency: A Psychological Analysis of the Life and Times of Cesar Chavez**

**ABSTRACT**

Cesar Chavez is an honored and respected humanitarian, leader of the farm labor movement, and civil rights leader. Many scholars and other writers have researched his leadership, however many are not aware of his early life pre-farm labor movement. In my research I have found that Chavez’s early childhood experiences led to his adult successes.

For an accurate analysis of Chavez’s success, it is essential to understand his background. In Cesar’s childhood he was once so impoverished that he frequently lived in a car, or a tent. His family had little or no money to buy food and clothing for their children. Chavez did not have much formal education; in fact he did not receive a high school diploma, and only received an 8th grade level education. In psychology, developmental theorists use resiliency theory as a tool to examine how children overcome harsh adversities and develop into healthy, successful adults. Psychological researchers argue that adversities place children at a higher risk for developing abnormally into adulthood. Problems that they may face in adulthood may be psychopathology, criminal activity, and depression, among other problems.

In addition, a longitudinal study of migrant children will be useful in analyzing how the theory is applicable to other migrant children. Research will involve a thirty-year longitudinal study of migrant children that will document the children’s development from birth to thirty years old. An examination of the children’s development will include birth, early childhood, adolescence, and adulthood. The methodology will include interviews with children,
parents, teachers, siblings, and all social service and government agencies that the children come into contact with.

It is my hope that this research will help uncover the variables in migrant children’s lives that can be beneficial to their successful development in order to help other students.

"We draw our strength from the very despair in which we have been forced to live. We shall endure." Cesar Chavez

Cesar Chavez is an honored and respected humanitarian, leader of the farm labor movement, and civil rights leader. While many scholars, authors, and other academics have researched his life as a civil rights leader during the farm worker labor movement—very few have researched his early life prior to the farm labor movement. Thus in an effort, to garner a better understanding of Cesar Chavez the man and the leader, it is imperative to examine his early formative childhood years. Who was the real Cesar Chavez? How did a young poor, uneducated, minority overcome a myriad of obstacles including poverty, homelessness, and low educational attainment, develop into such a successful civil-rights leader? What early childhood experiences may have led to his successful adaption into adulthood? In psychology, developmental theorists use resiliency theory as a tool to examine how children overcome harsh adversities and develop into healthy, successful adults. Psychological researchers argue that such adversities place children at a higher risk for developing abnormally into adulthood. Such children will typically experience a number of adulthood problems such as psychopathology, criminal activity, depression, among other problems.

This paper has been divided into three parts. The first section will include a review of the literature. The second section will include a theoretical analysis of Cesar Chavez’s early life as a
case study, in relation to the theory of resiliency. Resiliency theorists examine the developmental course of children raised in adverse circumstances. The theory points to early influences and support that children receive as a determinant if the child will ultimately overcome their struggles, and be successful later on in life. Cesar Chavez is an ideal candidate to research as a theory building case study—a thorough analysis of his early life demonstrates the presence of several developmental risks, as well as a number of protective factors. Examples of risk factors include: chronic poverty, homelessness, and marginalization he experienced as a result of racism. Examples of protective factors include the supportive relationships he enjoyed with his mother and grandmother. Additional protective factors include his strong connection to the church, and his overall positive self-concept.

The third part of this paper will recommend further areas of research needed to solidify the theory. More specifically, this section will propose the need for a longitudinal research study of migrant children as means to further understand how the theory may or may not be applicable to other migrant children. The basis of the research thesis will focus on whether or not the theory will be replicated in the analysis of twenty migrant children. Research will involve a thirty-year longitudinal study of twenty migrant children that will document the children’s development from birth to thirty years old. An examination of the children’s development will include birth, early childhood, adolescence, and adulthood. The methodology will include interviews with the children, parents, teachers, siblings, and all other similar social services and/or government agencies that the children may have interacted with throughout their lifetime. In sum, the main part of this research will focus on uncovering both positive and negative variables present in the lives of migrant children that may/or may
not be beneficial to their overall successful development and adaption into adulthood.

**Literature Review**

Research by Griswold del Castillo, Garcia (1995) demonstrates that Cesar Chavez’s early life was filled with turbulence and poverty after the Great Depression of the 1930’s. Soon after losing their family farm and small adobe home, the family left Yuma Arizona for California in search of farm labor work that they had grown accustomed to on their own land. However, the new work that the Chavez family now did was work that was back breaking, with long hours, poor wages, and little if no breaks. Their new work was especially hard on the Chavez children. They were not considered as children, but rather as workers with the same responsibilities as adult migrant workers. Nonetheless, the Chavez children continued their contribution to the family unfortunately at the expense of their own education. Pitrone (1971) found that by the age of fourteen Cesar had attended thirty-seven schools equivalent to the eighth grade, and never finished school. Cesar felt that his contribution to the family’s income was imperative for day-to-day food on the table. School was not a means to survival for the family; fieldwork was their only means for survival.

**Theoretical Perspective**

A theoretical analysis of the resiliency theory on the life of Cesar Chavez will give insight as to how he became successful despite adversity. Research on the theory has provided two fundamental variables about resilient individuals. The first variable is **risk factors**. Brooks-Gunn and Duncan (1997); Steinhauer (1998) found that **risk factors** led to developmental risks that can create difficulties for children to grow into older competent adults.
Examples of risk factors: include poverty, child abuse, parental psychopathology, prenatal stress, death of a parent, homelessness, living in a dangerous neighborhood, can all affect a child if they are exposed to such chronic adversity. The second variable is **protective factors**. Protective factors- are variables that reduce the chances of a child developing abnormally (i.e., a warm caring relationships with adults, a positive self-concept, and support from an external community. Gamezy (1991) suggests that if there are protective factors in the life for at risk youth then the child’s outcome have a greater chance at success.

Werner and Smith (1992) are leading authorities on the topic of the resilient child. They were interested in how a study that researched a life span of children who experienced poverty, as well as other negative variables would add to the theory of resiliency. They conducted a thirty-year longitudinal study that examined the effects of protective factors on the lives of children who were impacted by a variety of biological and psychosocial risk factors. At the end of their study they found that a majority of the cohort became successful adults. They found that the definitive factor that led to the success of their cohort was the presence of three protective factors. The first, is the children had at least average intelligence. This skill helped with the child’s ability to use cognitive reasoning and critical thinking skills. The second factor, was a caring relationship with at least one parent. The third protective factor was external relationships (i.e., relationships with extended family, church, and community groups.) These relationships provided children with additional support and healthy relationships.

Cesar Chavez is an interesting person to research for this theory because his life demonstrates several developmental risks, as well as protective factors. Examples of his risk factors are as
follows: he came from an impoverished family, was homeless as a child, lived in impoverished dilapidated neighborhoods, and was a minority. Examples of Chavez’s protective factors in his life are his supportive relationships with his mother and his grandmother, his connection to the church, and his overall positive self-concept.

**Cesar’s Journey to Adulthood**

Cesar Chavez is a man that symbolized freedom, a Mexican-American civil rights leader, and humanitarian. Nevertheless, who was the real Cesar Chavez? How did a young poor, uneducated, minority overcome his obstacles in life, and develop into such a successful leader? What were Chavez’s early experiences that may have led to his successful adulthood? Research on Chavez’s life as a case study; will help examine his life in relation to the theory of resiliency. Resiliency theory researches the developmental course of children that come from adverse backgrounds. The theory points to early influences and the support that children receive as a determinant if the child will overcome their struggles, and be successful later on in life.

In addition, further research will be needed to solidify the theory. My future research proposal will be a longitudinal study of twenty migrant children from birth to 30 years old. My research questions whether the theory can be replicated in an analysis of twenty migrant children. Are there protective factors present in the children as a migrant child that will help them become successful?

The Resiliency theory is a developmental psychological perspective that began nearly fifty years ago. Werner and Smith (1992) are leading authorities on the topic. In the early 1950’s they researched the long-term effects of childhood adversity on the adult lives of men and women who were exposed to poverty, parental discord/ and or psychopathology, and perinatal stress-
The theory of Resiliency discusses three major variables. The first is risk factors, which can be described as stressful situations and chronic adversity that put children’s successful development at risk. (i.e., chronic poverty, child abuse, neglects, marginalization as a minority, divorce, living in violent communities, perinatal stress, and serious care giving deficits.) The second variable is protective factors. Protective factors can be described as variables that reduce the chances that a child will develop abnormally. (Mash, and Wolfe, 2002) (i.e., strong family supports, a relationship with community, church, a mentor, and a strong sense of self.) Garmezy (1991) found that if there is a presence of one or more protective factors in an “at risk” child’s life, then they are more likely to weigh out the negative risk factors. The third variable is the “resilient child.” According to Bonnie Bernard (1991,1997) there are at least four common attributes of the resilient child. They exhibit: social competence-these children are flexible, empathetic, responsive and caring. In addition, they have many relationships and friendships with others. Resilient children also exhibit problem-solving skills- they are able to think critically, reflectively, and are apt to solve social problems with creativity. Resilient children also exhibit autonomy- they have a strong sense of self, a positive self-esteem, and self-efficacy. Lastly, they exhibit a sense of purpose- resilient children believe that they will have a bright future, and that they themselves determine their lives.

In my research of Chavez I have found that before he became a leader and founder of the United Farm Workers Union,
he was a poor migrant farm worker. It is remarkable how Chavez overcame many hardships, and grew into a successful adult. How is it that an individual like Chavez can overcome obstacles and extreme hardships to become a successful adult? In psychology, researchers have been puzzled over this same question. The resiliency theory describes such people. Researchers have found children who survive risky environments such as Cesar Chavez due in part to their strong self-confidence, coping skills, and ability to avoid risk situations are considered resilient- they seem able to fight off or recover from their misfortune. (Zimmerman, M.A and R. Arunkumar, 1994)

Cesar Chavez was born March 31, 1927 to parents Librado and Juana Chavez in a small town twenty miles north of Yuma Arizona. Cesar Chavez was born into a middle class family. Cesar’s father, Librado was a small businessman who owned a small grocery store, a pool hall, and an auto repair shop. (Griswold Del Castillo, and Garcia 1995) In the early years of the Great Depression the Chavez family was virtually untouched by the unemployment and poverty that many others experienced.

However, it was not long until the family also felt the affects of the depression. Through a bad business decision, coupled with granting clientele credit for grocery purchases, and auto repairs, the Chavezs’ were forced to sell their businesses to cover back taxes, and business obligations. The family then had to live with Grandmother Chavez in an old adobe house on a 160-acre homestead.

Before long, the family was in debt again owing the state $4,080 in back taxes. They were unable to make payments so their property was seized, and they were allowed to stay on the property for only one more year. At this time Librado as many other men at
this time left for California for farm work. Librado believed that the work in California would bring enough money to get the farm back. Dreadfully, he found that the wages earned in farm labor were substandard, and would require a collective effort from the entire family, including his children. Sadly, they were still unable to raise enough money to buy the farm back. They were forced to sell it, and move. The family then set off for a new life of migrant farm work.

This period in young Cesar’s life can be described as a period filled with “risk factors.” It was during this time that the family lost their livelihood, all their assets, and was essentially homeless. This marked the beginning of many decades to come filled with struggles for money and survival for Cesar Chavez. Cesar’s experience with chronic poverty was very painful. This type of stress for a young child is very detrimental to their normal development. Moreover, this can cause worry and anxiety for the child. In addition, chronic food deprivation can cause serious physical and cognitive health problems.

For the next ten years, the Chavez family worked in migrant farm labor. It is these experiences that can also be described as “risk factors.” During his years spent in migrant farm labor, Cesar’s family incurred a lot of maltreatment, including intolerable working and living conditions, and racism. During these difficult times for the Chavezs’ like many other migrant workers of the time experienced a series of exploitations. The Chavez family experienced unremitting hunger; poor wages; many times they barely made enough money for gas to make it to the next farm. They were cyclically homeless, living in their car when there were no labor camps available. When the family was given the advantage of living in the labor camps, they lived in tiny
tarpaper-and-wood cabins without indoor plumbing and with a single electric light. (Griswold Del Castillo, and Garcia 1995)

If working conditions and meager wages were not enough, the workers also endured racism. Chavez remembered, “I still feel the prejudice, whenever I go through a door. I expect to be rejected, even when I know there is no prejudice there.” Chavez had experienced a great deal of racism. He recalls as a young boy him and his brother, along with other Mexican-Americans or (Mexican) shoeshine boys were not allowed in White neighborhoods. On one occasion, he and his brother went to a diner, in the window there was a sign that said WHITE TRADE ONLY. The young boys proceeded to order a hamburger, the counter girl told them with a laugh, “We don’t sell to Mexicans.” The two boys left, Cesar in tears. (Griswold Del Castillo, and Garcia 1995) Other restaurants that the family came across had signs that said NO DOGS OR MEXICANS. Many Mexicans were refused food, or even use the use of restrooms in main highway gas stations. (Pitrone 1971)

To apply the concept of risk factors in an analysis of Chavez’s life, they would be chronic poverty, homelessness, and marginalization as a minority. Research has found that minority children are over represented in rates of disorders such as substance abuse, delinquency and teen suicide. (McLoyd 1998) Considering that minority children and youth face multiple disadvantages, such as exclusion from society’s benefits (often referred to as marginalization) and poverty, it is understandable why many feel a sense of alienation. (Steinhauer 1996) For a child to endure such circumstances as an exploited child worker, constantly relocating, having no real home, little education, and racism are all risk factors. All of these factors could contribute to a child’s unsuccessful development. It is clear that these types of
negative variables in Chavez’s life could have had a huge impact on his self-concept, and his development into adulthood.

On the other hand, Cesar also experienced protective factors in his life. To reiterate, Protective factors – can be described as strengths in the family, school, community and the individual. (Masten, and Coatsworth 1998) A protective factor can be as simple as a teacher taking interest in a student. If that child feels that they are receiving support, and interest this can help him/her internalize the support and develop a stronger self-concept. Through researching Cesar’s life I have found that he had protective factors through the love, warmth and guidance from his mother and grandmother.

For example, the years spent on the family farm, Chavez had the benefit of protective factors, such as a loving, caring and warm relationship with his mother. He was taught the values of ethics, and respect. Later Chavez reflects on these as secure and happy times. His mother, Juana would teach him about views on nonviolence and morality. She spent a great deal of time with her four children telling them many cuentos (stories) and gave them consejos and dichos (advice and sayings), all with a moral point. Chavez later remembered: “I didn’t realize the wisdom in her words, but is has been proven to me so many times since.” (Griswold Del Castillo, and Garcia 1995)

Another major influence on young Chavez was his grandmother’s religious teaching. She instilled a love of the rituals of the Roman Catholic Church, the Sunday masses, Christmas, and Easter obligations, and special feast days. In his life Cesar would depend on the spiritual strength he gained from his grandmother’s influence, and the church. (Griswold Del Castillo, and Garcia 1995) This relationship with his grandmother is another example
of a **protective factor** in his childhood. Cesar’s grandmother gave him lots of love, guidance, and nurturance. Through her teachings of Catholicism, Cesar learned how to put faith in a higher power, a faith that was unwavering throughout his life. Cesar drew upon his faith when times got hard just as his grandmother, and mother did.

In short, these three **protective factors**, his warm caring relationship with his mother, grandmother, and his connection to the Catholic Church helped build a strong sense of self for the young Cesar. In addition, as Cesar grew older, and became exposed to an array of injustices as an adolescent and young man, he drew from his early teachings of morality, and nonviolence to help resist his adversity.

**Conclusion**

Chavez is an example of what it is like for a poor, uneducated, minority to make it in today’s society. Through my research I have found that he became a success because of both his positive and negative experiences early in life. If it were not for all of Cesar’s experiences in life he would not have become the man or the leader he developed into. The theory of Resiliency is useful in analyzing the successes of unfavorable life circumstances, and the impact of resiliency of disadvantaged people.

Additional research is needed to examine if the theory can be replicated for other migrant children. A longitudinal study to examine the effects of poverty and marginalization on their development will be needed. My question is whether resiliency theory is applicable for migrant children as it was for Cesar Chavez?

The methodology for my research will be to monitor the development of the children, document events in their lives, and
see if the protective factors in their lives help outweigh the risk factors. My study will examine the group for the course of thirty years. I will do research on their perinatal life, childhood experiences, work experiences, educational attainment, and adult life. My methodology will also include interviews with the parents of the children, government agencies that the children have been in contact with, schools, and any social service/non-profit agencies the children use. I will examine five aspects of their development. First, I will look at their childhood development milestones such as crawling, walking, and talking. Secondly, I will examine their development in interpersonal relationships. Thirdly, another aspect of examination will be their education life, and their grades. The fourth aspect will be a presence of any mental deficits. The last segment of the study will be their adult life. How successful do they feel? Are they happy? This research will be informative, and help determine if the resiliency theory can be replicated for migrant children.

**Bibliography**


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<th>Biography</th>
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<td>Esmeralda Merino recently graduated from San Jose State University with her Bachelors in Nursing. She is currently working in the spinal cord rehabilitation unit at Santa Clara Valley Medical Center. Esmeralda plans to obtain her Ph.D. in Nursing and her future plans are to teach at a university. Her passion is to diversify the nursing population and recruit more Latino/a’s, African American’s and Native Americans into nursing.</td>
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**The Benefits of Certified Nurse-Midwifery Centered Care and the Obstacles These Professionals Encounter: A literature Review**
The Benefits of Certified Nurse-Midwifery Centered Care and the Obstacles These Professionals Encounter: A Literature Review

ABSTRACT
The focus of this literature review is to provide a basic understanding of the benefits of nurse-midwifery centered care during the birthing process and the obstacles that midwives encounter within their scope of practice. Certified Nurse-Midwives have a decreased rate of interventions during the birthing process: cesarean sections, narcotic and spinal blocks, and instrument assisted births occur less often when a midwife is present. Although, midwifery care is less invasive there is little economic gain with this mode of practice. Without interventions hospitals are unable to collect revenues for their institutions. In addition, the practice of midwifery is viewed as non-profit and threatened by modern techniques.

Introduction
There are many benefits to Midwifery. As Slome put it, “Midwifery care is women-centered, empowering women by giving both psychological support and physiological care, and looks to simple, non-interventive remedies before resorting to technology. Midwifery care is appealing to many women because it takes a more natural approach to childbirth” (Slome, 2002). In order for nurse midwives to practice they must first follow guidelines.

Goodman states that certified nurse-midwives must demonstrate core competencies, graduate from accredited education programs, be nationally certified and adhere to licensure standards that are recognized and accepted in every state in the US (2007). In addition Goodman stated, “Certified nurse-midwives’ (CNMs) are able to provide care to most healthy pregnant and
birthing women in all settings-including hospitals, clinics, freestanding birth centers and homes.” Moreover, extensive education and training is involved before a midwife can practice in the clinical setting.

CNMs are specially trained in the labor and delivery process. CNMs are registered nurses who have completed a degree at the master’s level and have extensive clinical experience. Even though midwives are educated on the scientific approach to health care they continue to view the female physiological process as a natural progression of life.

The practice approach of the CNMs to childbirth is being a noninterventionist, be supportive which makes the pregnancy and birth experience seem as a normal process (Murray & McKinney, 2006). The benefits of having a midwife present is the mother can have more autonomy for her own care and her child’s. For example, a woman can verbalize her concerns to a midwife about her pain and a midwife can support her concerns by suggesting alternatives to narcotics and spinal blocks. Although midwifery care relies heavily on education and prevention, society’s perception of women’s health is negative. For example, Zeldes and Norsigian stated, “as was true when the women’s health movement began, women’s life experiences- such as childbirth, menopause, and aging- are too often viewed and treated as diseases, rather than as natural life processes” (2008). With this popular belief about women’s health it is no wonder that women typically go to a hospital to give birth with physicians present.

In recent times home births and birthing center have increased in popularity yet, there is resistance from professional organizations and society from accepting a less medicalized method of childbirth. In the last century the role of CNMs have come under scrutiny for various reason however, research shows
that there are less interventions when a CNM is present during childbirth.

**History**

For centuries women have been delivering at home. Moreover “until the 1900s, homebirth was the place of birth for most Americans. In fact, over 90% of those alive on earth today were born at home!” (Cryns, 1995). According to Lynch, in 1915 nurse midwives attended 40% of homebirths; that number drastically declined to less than 11% by the 1930s (2005). Although homebirths are less common today, having a CNM present is still an option for many families. Women may enjoy the option of having their feelings and needs acknowledged by a midwife. Past research revealed that physicians who were involved in the birth process intervened at a higher rate with modern techniques such as a cesarean section. Since midwifery care is a patient centered approach and focuses on decreasing the rate of interventions; then one may ask why is midwifery not practiced more?

When mothers are experiencing signs of complications, physicians are eager to proceed with cesarean sections leaving mothers scarred for life. In a study conducted by Janssen et al., all women in the study met eligibility requirements for home births but decided to deliver at the hospital. One cohort had a CNM attend the birth and the other cohort had a physician attend the birth. Overall the rate of cesarean section for the CNM cohort was 10.5 percent and 16.3 percent in the physician cohort (2007). In the same study the nurse CNM cohort had fewer women who used narcotic analgesics (12.1 vs 31.3%) compared to the physician group. Women with the CNM group were less likely to receive electronic fetal monitoring (51.4 vs 79.5%). Cesarean sections, narcotic analgesics and electronic fetal monitoring are some of the interventions that women can expect to encounter.
There are many factors to consider when women and their families decide to deliver in a more natural setting with a midwife present. One of the key factors women should know before delivering at home is if they have any pre-existing medical conditions such as diabetes or hypertension. The reason why knowing pre-existing medical conditions is important is because these conditions may cause problems and increase the rate of interventions. For example, babies born to diabetic mothers tend to be larger in size, therefore the possibility of cesarean sections increase (Murray & McKinney, 2006). The ideal candidates for natural settings are women who are experiencing a healthy pregnancy. Furthermore, in order for a woman to be a candidate for homebirth or a birthing center she must be considered at low-risk.

Low risk usually means little or no chance of complications. According to a study conducted by Janssen et al. (2002) “Exclusion criteria for candidates for homebirths were: multiple birth, heart disease, hypertensive chronic renal disease, pregnancy-induced hypertension, diabetes, active genital herpes, breech or abnormal presentation, gestational age less than 37 weeks or greater than 41 weeks at onset of labor, more than one previous cesarean section.” Therefore, a women’s own health is a good determinant of their birthing environment.

Although, the more natural approach to childbirth is desired by many women little is being said to these women about the benefits of having a CNM present. CNMs have a lower rate of cesarean section deliveries, decreased use of pain medication and a decrease rate of instrument assisted deliveries.
Cesarean section

A cesarean section is a surgical procedure performed in an operating room. The surgery involves removing the baby through the abdomen, one incision is made in the abdominal wall and the other in the uterine wall. Since a cesarean section is a surgical procedure there are risks involved. In a study conducted by Zeldes and Norsigian, there was a 44.7 percent chance women were more likely to suffer from a stroke in 3 months after a cesarean section (2008). In the same study it was also noted that women experienced pain at the incision site up to 6 months after surgery. This surgical procedure is usually performed when women fail to progress (dilate), baby is in breech position, baby is in distress or there are multiple babies. Although, there are increased risks with cesarean sections more woman are subjected to this surgical procedure.

In a study conducted by Romano and Lothian, the cesarean section rate in 1970 was 7% in 2005 the rate was 30.2%, according to the authors this increased rate is due to the interference of the normal physiological process. “Nature’s simple plan for birth has been replaced by a maternity care system” (2008). However, the midwifery approach to the birthing process may decrease the need for unnecessary interventions like a cesarean section.

In a recent study conducted by Janssen et al. maternal outcomes were compared between a cohort of physicians and a cohort of CNMs, the cesarean rate was compared between the two groups. It was found that the cesarean section rate was 23.3 percent in the midwife cohort and 67.7 percent in the physician cohort. The study also compared the rate of vaginal birth after cesarean (VBAC) between the two groups and in the CNM group the rate attempted was 93.3 percent with an 82.1 percent success rate. The physician cohort attempt rate of a VBAC was 41.6 percent with a success rate of 80 percent (2007). It is apparent that in this study
the results show that the midwife group chose a more natural route. A more natural route also involves a decrease rate of pain medication administration.

**Analgesics and pain relief**

Labor is an intense physical and emotional experience, although women have been experiencing labor for thousands of years modern medicine has been able to decrease the amount of physical pain a woman experiences. However, there are risks associated with the use of analgesics during labor. Women have the option of using various types of pain relief medication but, at a cost.

According to American Pregnancy.org, there are several popular types of narcotics that are used during labor, Demerol, Morphine, Stadol, Fentanyl, and Nubain. With many narcotics there are side effects: respiratory depression, dizziness, nausea and vomiting to name a few. Not only do mothers experience these side effects but so do their unborn children. However, a popular alternative to a narcotic is an epidural which relieves pain.

An epidural is an “injection of local anesthetic into the epidural space which interrupts the transfer of information along nerves entering or leaving the spinal cord. An epidural provides the potential for pain-free contractions without impairing level of consciousness” (Halls, 2008). Epidurals are ideal for women whom are seeking a painless delivery. However, there are complications associated with this type of pain relief.

“For example, it interferes in important ways with the normal physiology of labor and birth. Relaxation of the pelvic muscles makes it more difficult for the baby to rotate and descend, and the absence of pain can interfere with the natural release of oxytocin” (Romano and Lothian, 2008).
Moreover, women typically experience restricted maternal mobility which may create a problem when women are ready to push in the birthing process which has various steps. Other disadvantages that women tend to experience with the epidural may be hypotension and increased maternal temperature (Halls, 2008).

**Instrumentation assisted births**

Instrumentation assisted births occur when the baby is unable to descend through the vaginal opening. The common instruments used are forceps and a vacuum extractor. When these devices are used they increase the likelihood of vaginal trauma. For example, forceps can cause 3rd degree and 4th degree lacerations in the vaginal walls. The vacuum extractor can cause severe genital tract trauma. In addition, the infant can also experience head and facial trauma. (www.thewomens.org.au).

In a study conducted by Romano and Lothian (2008) it was noted that women who used an epidural for pain relief had an increased risk of having an instrumentation assisted birth. This is due to the fact that women are unable to feel the normal progression of labor. Therefore, they are unable to locate the position of the baby in the birth canal. In another study conducted by Halls it was stated that an epidural interferes with mothers expulsive efforts and can prolong the labor and an increases the rate of instrumental delivery (2008). The physiological process of childbirth is a natural process yet modern medicine continues to alter the outcomes. Research shows that nurse-midwives are more than adequate to provide optimal care to low-risk pregnant women however, the practice of midwifery encounters political and economic obstacles.
Political and Economical Obstacles Midwives Encounter

In 1925 nurse-midwifery came to the United States when Mary Breckinridge brought the concept with her from Great Britain (Jolivet, 2006). A CNM care is based on the philosophy that focuses on prevention and education (Jolivet, 2006). CNMs provide a wide range of services. These services include prenatal care with referral services, managing the health care of mothers and newborns in the immediate postpartum period, providing gynecological care from adolescence through menopause, this care includes yearly physical exams, breast exams, Pap smears, preventative care and cancer screening, management of common illnesses and menopause counseling (Jolivet, 2006). CNMs provide a wide range of services, yet their services are not utilized completely. Reasons for women not choosing midwifery centered care is due to little knowledge of this type of service.

In Great Britain a team of researchers initiated the Birth Place Choices Project (BPC Project). The project objective was to identify which factors influence women’s decisions about where to give birth. The team questioned why more women do not choose midwifery-led units (MLUs) or home births. A survey revealed that nearly 50% of respondents were only offered one birth place option (Barber, Rogers, and Marsh, 2007). It appears that women are not informed of their options of where to give birth. Apparently CNMs are not viewed as vital members of the obstetric team and this may be why midwives encounter resistance from other professionals in obstetrics and gynecology.

Medicine has united and pushed their agenda in regards to maternity care. According to Lynch, “They took over maternity care by defining pregnancy and childbirth as a pathological process within a risk-based value system and, despite significant evidence to the contrary, promised women better outcomes under a
physician’s care in a hospital setting” (2005). Hospitals and physicians have a bigger agenda. The role of the CNM is being threatened by other professionals. Although, home births/birthing center deliveries are better for mother and baby there is economic gain from increased interventions during childbirth.

Health managed organizations control health service usage by members in order to decrease cost (Goodman, 2007). With rising overhead and lower reimbursement hospitals administrators have to strategize on how to make this area of health care more profitable. Another point that the author highlighted was that high-volume, high-cost obstetrics are more profitable and hospitals are able to maximize billing. Cesareans are surgeries which may bring in more money for the hospital. Not only do hospitals get reimbursed for services, but they are also paid by universities for allowing medical students and residents to practice at these institutions. As noted in a study by Goodman, one nurse mid-wife commented on residents taking jobs away from them. She said, “The more residents they take the more money they get. So if you get rid of the midwives doing the deliveries, and get residents doing the deliveries, you get extra money and don’t have to pay the salary and benefits of the midwife” (2007). Obstetrical units can get paid twice as much for services rendered to the patient if a resident or attending physician is present in addition to the funds they receive for the services rendered to the student or resident (Goodman, 2007). Hospitals economic gain from childbirth is irrefutable; it appears that the money these institutions gain outweighs the fundamental beliefs of practicing health from a more holistic setting. Not only do CNMs fear the financial repercussions, they also face bullying from professionals in their own specialty.

In the Goodman study, the author reviewed a University-based Midwifery Service associated with a prominent university and hospital, which served as a clinical site for midwifery nursing
students. During this time midwives attended 75% of births until it changed its operation in October 2003 (2007). At that point it was abruptly decided that the patients were too “high-risk” for midwifery care and midwives would no longer be permitted to attend births. After unwanted media attention hospital administrators and doctors decided to modify clinical guidelines and allowed midwives to once again attend births, but the guidelines implemented restrictions and altered the fundamental principles of midwifery. Ultimately, midwives left the hospital due to practice restrictions.

Conclusions/Future Research Implications
The practice of midwifery has decreased throughout the last century. Medical professionals have controlled the arena in which maternity is practiced. The world health organization states that 70-80% of births are normal and uncomplicated (Goodman, 2007). Yet, childbirth is treated like a disease process in which invasive interventions are viewed as necessary. Cesarean sections, administration of narcotics and spinal blocks, and instrument assisted devices are a few of the interventions women can encounter in almost any birth setting, but as research shows there is an increase of interventions when a physician is present. Midwifery centered care is ideal for women seeking to have their life processed viewed as that a life process and not a disease process.

Furthermore, the health care system should not view pregnant women as a profitable market. The economics of maternal care has altered the way care is provided to women. Childbirth should not be viewed as a lucrative industry in which hospitals and its administrators can exploit a natural progression of life. With economics playing a major role in the practice of maternal care it is no wonder CNMs encounter conflict. In order for the conflict to resolve further research needs to be done about the benefits of
midwifery practiced care. More women should be informed about
this type of care and should be able to have more autonomy in how
they are cared for.

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Hanif Mohebi

Major
Communication Studies

Mentor
Dr. Ken Montojo

American Muslims and the Ideology of “Smart Power”
Mediation: Effective American Muslim Self Advocacy

Biography
Hanif Mohebi is a Senior majoring in Communication Studies at San Jose State University with a minor in Social Justice and Globalization. Currently, he directs a Communication Consulting Firm in San Jose, California. He is aspiring for a PhD program in the social sciences. Born in Afghanistan and raised in the heart of Silicon Valley he is a young and passionate Muslim American, with a wonderful cosmopolitan attitude and great love for civil rights, human rights and the Constitution of the United States. He is a well known speaker within his community, and volunteers with many non-profit organizations. He is obsessed with the idea of bringing about a positive change to the world through dedicating his life to serving humanity. In quest for this dream, he is seeking to do research to further his worthy cause.
American Muslims and the Ideology of “Smart Power” Mediation: Effective American Muslim Self Advocacy

Authors: H. Mohebi1 and Dr. K. Faulve-Montojo2

ABSTRACT
American Muslims have been in the spotlight since September 11, 2001. Their civil and human rights are being violated, some feeling like second-class citizens. Many organizations are advocating for equal treatment. The American Muslim groups so far have been using forces of diplomatic advocacy which are not effective. This paper argues that a new strategy should be explored; it uses theories of international politics, mainly Dr. Joseph Nye’s theory of smart power, and appropriates it to the American Muslim groups doing advocacy within the United States. Finally, it states that diplomatic advocacy should be coupled with traditional advocacy, therefore producing smart advocacy strategies which will level the mediation groundwork for parties involved.

Key Words: Muslim, Smart Power, Advocacy, Mediation, Negotiation, Diplomacy, Minority.
Introduction

Dynamics of the American Muslim Community:

Whether everyone agrees or not, it is a known fact among historians and scholars, including Ivan V. Sertima, Diouf A Sylviane, and Abdullah H. Quick, that the Muslim history in America extends many years before Columbus arrived. The American Muslim community has gone through many phases and has played an undeniable role in American history without much recognition. However, in recent years, the horrific event of September the 11, 2001, and all the post-media focus on the Muslims have reminded the general American public of the existence of an American Muslim community among them.

There are between six to nine million Muslims living in America (Qureshi 199). About one million live in California, eight hundred thousand live in New York, and others are spread across the country in almost all states (Hasan 45). One-third of the Muslims living in America are of African descent (Quereshi 199). Many other Muslims come from various origins including indigenous “converts” or “reverts” who have made America their permanent home (Nyang 18).

In the past three to four decades, the American Muslim community has raised its level and status to new heights, mainly through building institutions. The number of mosques, Muslim educational entities, Muslim political and social advocacy groups, publications, higher educational bodies, and Muslim businesses has increased incredibly (Nyang 22-30).

Eight years ago, Asma G. Hasan in her book American Muslims: The New Generation estimated there were about two thousand
(2,000) mosques, 200 Islamic schools, and 200,000 businesses, which are owned and managed by Muslims. She also recognized about 89 publications and 426 associations (Hasan 45). The above data, which may have multiplied in the past eight years, provide a strong support for the conclusion of Howard University Professor Sulayman S. Nyang that “Islam has gone through many developmental changes and is now here to stay” (Nyang 29).

Any minority community that wants to stay permanently must find ways to comprehensively be recognized as part of the community without losing or compromising their cultural, religious, political and intellectual originality, which is actually a component that strengthens America as a whole. Surely the American Muslim community has already carved institutions that may lead or direct them towards such a goal. Perhaps what is absent from the equation to make this goal a reality in decades or perhaps centuries in the future is the lack of strong, formal, and organized think-tanks that could provide research, critical analysis and a theoretical framework to be followed by the existing institutions and those to come.

On the other hand, it is crucial for law enforcement agencies, those in power, and the general community to understand the dynamics of such minorities and to facilitate such transitions in a positive way to manage any distractions or disturbances that may lead to negative results for both parties.

One cannot deny the successes of the political, social, and religious institutions the American Muslim communities have built so far, and which Dr. Nyang acknowledges as “remarkable achievements” (115). However, one should not conceal their weaknesses if the American Muslim community desires better results. Some of the
Specification of the Problem
This research was largely motivated by a real incident that took place on a university setting. The story follows of what happened and what questions it raised.

One early morning, a Muslim student was walking towards his 7:30 a.m. philosophy course. He saw a flyer advertising an event that was publicizing an act of absolute disrespect and disregard for both Christianity and Islam (the flyer specifically mentioned both religions), two of the world’s largest faiths. It was inviting viewers to join them in the burning of the Holy Bible and the Holy Quran on a specific location and time on the university grounds. Feeling violated, disrespected, and fearful that some Muslim students or perhaps others with less experience might get too agitated and act in a negative way, he took it upon himself to do something to stop this event before it escalated.

He filed a formal complaint with the university police and Event Center and took the issue to both of the religious student groups. The student groups formed a coalition and wrote a letter to the university president and other officials and responsible departments advocating for their cause. To make the story short, according to the students every diplomatic effort was taken to make sure the issue would be solved in a civilized manner. A week passed and no one, including the university police, responded to the concerns of the students and the complaint that was filed. The students approached the university police and demanded an explanation or update on the case. At this point, they were told they could not really do much about this case, because it was a
“freedom of speech issue.”

Not convinced by this argument and fully aware that it is not freedom of speech for one to “yell ‘fire’ at a crowded theater,” the students continued to advocate for their case. The second week was passing quickly without any response or any kind of communication from the administration. The nervous students called upon the county officials for help and direction. Even after their involvement, there was no sign of results, and no communication was made by the university administration with the students.

The students, feeling ignored, understood that their mediation and diplomatic efforts had failed, they were the weaker party, and the negotiation table was unequal. The administration had simply decided to ignore them; they would not even communicate with them. Desperate and determined to stop the event, they consulted with two lawyers and many others, including philosophy professors specializing in social justice.

The outcome was that, after going through a full list of diplomatic efforts which had been ignored by the administration even with the negative impact and intensity of the event considered, as a last resort the students were going to stop this event by an act of civil disobedience and as a last resort by any means necessary. The students made their intentions clear to the administration about stopping the event by civil disobedience or whatever it takes to accomplish their goal.

Within less than two hours of announcing the intent of a civil disobedience act, the students got an email followed by a personal call by the university officials encouraging the students not to take
any action and assuring them that they had already taken care of the issue. They had found the other party in violation of fire code regulations and, therefore, had threatened the other party with arrests in case they showed up for the intended act.

With less than forty hours left for the event to take place, the students felt they could not trust the administration and responded that they would be at the location of the event, just in case, to make sure the event did not take place.

On the day of the event, the other party did not show up at all. On one side was a heavy duty police force ready with guns, and on the other side were about ten determined students with no weapons of any kind. In the middle of all this was a representative of the students and an official mediator sent by the county to “resolve” the issue.

After almost two hours of speaking to the student representative, the county mediator concluded that, both parties were at fault. To the mediator it was clear “that the administration could have responded with a more effective communication methodology. So too, could those ‘10 determined students’ not have implied the threat of violence or force in order to put a stop to the burning of those holy texts.” The whole purpose of the mediator was to “take the event of the day as an opportunity for mutual improvement in dialog between the two parties.”

Until this day the mediator is trying to work with both parties to come up with strategies to prevent such matters in the future, however at the end, even the county officials were unable to bring about any lasting changes mainly because of the unwillingness of the parties to comply. Finally, the students were viewed as
troublemakers by the administration officials for their boldness.

The above story raises many questions. Why were the students ignored throughout the developmental stages of the case, and why did the university respond so quickly when the variable of civil disobedience or “threat of force” was introduced? And why were the students perceived as troublemakers even though they were open to communication or diplomatic efforts in the beginning? If correctly analyzed and researched, perhaps these questions will bring about resolution and provide insights on how to resolve such tension.

The central purpose of this research was to shed some light, scratch the surface of this matter, or simply open the doors of discussion upon such questions in the field of minorities struggling to survive and be given the same rights, respect, and dignity as the larger and general community. And, in specific, it was about effective Muslim American advocacy.

Our premise was that, if this research was done correctly, a set of theoretical approaches would be presented that will help minority groups in their various forms of advocacy, be it human rights, civil rights or other specific rights they are striving to achieve.

**The nature of the work performed: Variables, definitions, and methods**

This paper is a qualitative social science research. We began with three hypotheses driven from various situations and observations, specifically from the incident in the above story, and we conducted in-depth interviews with parties involved to get a better understanding of complications and implications surrounding Muslim American advocacy and negotiating with those in power.
(for example, police departments). We chose to interview high level individuals within two police departments and three Muslim advocacy organizations. One of the Muslim organizations was used as a control, because we already knew that they did not have a history of negotiating or open communication with governmental agencies.

**Definitions**

- **Diplomacy:** Negotiation between two parties without arousing hostility to resolve a matter and give the rights of individuals accordingly.
- **Muslim American:** Americans who are Muslim by faith
- **Administration:** A body that manages the affairs of the government, a bureaucracy that it is difficult to deal with.
- **Soft Power:** “Getting others to want the outcomes that you want, power of attraction and seduction. Soft power is attractive power.” (Nye 5-6)
- **Hard Power:** “Hard power rests on inducements (‘carrots’) or threats (‘sticks’).” (Nye 5)
- **Smart Power:** “The ability to combine hard and soft power into a winning strategy is smart power,” according to Dr. Nye in his article “In the Mideast the goal is ‘smart power’.” (2006)
- **Diplomatic Advocacy:** Promoting one’s cause with diplomacy and soft power.
- **Traditional Advocacy:** Promoting one’s cause using tools and techniques that go beyond diplomacy; this may include the use of hard powers.
- **Smart Advocacy:** The use of right and suitable combination (appropriate to context, time, place etc.) of diplomatic and traditional advocacy.
Variables
Our dependent variable was the outcome, the final results achieved by any of the groups in the process of getting what they want. Our independent variables were the actors, the subjects who were interviewed, the organizations they represent, and the tools and tactics that they use (soft power, hard power or smart power).

Hypothesis

Hypothesis Number One
In general, if the desired advocacy relationship outcome is not achieved at the present time, then the current use of tools, tactics and diplomatic advocacy (soft powers) is not effective.

Hypothesis Number Two
If the principles of diplomatic advocacy (soft powers), are coupled with the principles of traditional advocacy (hard powers), then the advocacy will be effective.

Hypothesis Number Three
If the two paradigms (diplomatic and traditional advocacy) are used simultaneously by the same entity, then the results will be largely negative.

The state of this research at the end of the study
We have found that the current use of tools and tactics along with the current type of diplomatic advocacy, which is basically the use of negotiations, is not effective. This does not deny the successes diplomatic advocacy has had, but this paper is proposing that diplomatic advocacy is only part of the solution because it cannot solve every problem that arises. For example, the use of
diplomatic advocacy in the case of the students dealing with the university administration was useless. Students were ignored completely.

Therefore, this research is proposing that theories of international politics and diplomacy be appropriated to domestic advocacy level. It argues that diplomatic advocacy be coupled with traditional advocacy to come up with better results. The research appropriates the work of Dr. Joseph Nye and argues for a “smart power” strategy to be applied by the minority advocacy groups for a healthier future. Historical accounts are used to support claims that are made.

The study further explains how the two paradigms should not be used simultaneously by the same entity, organization, or individual because it will produce a negative outcome.

**Literature Review**

*Method of Literature Review*
Academic Search Premier was mainly used with search words such as American Muslims, Muslim Americans, Muslims living in America, effective Muslim American advocacy, American Muslims and negotiations, American Muslims and dispute resolutions.

From the results, titles and, in some cases, the abstracts were read, and articles were chosen and printed for further examination. A total of 40 articles were collected. In the next stage, these articles were read and divided into two categories entirely unrelated to the research (18 articles) and somewhat related in some way, shape, or form, directly or indirectly (22 articles).
The third stage was to divide the “somewhat related” articles into various categories to simplify analysis accordingly. The results follow.

**Literature Review Results**

Seven articles were about worthy news that had made it to academic circles from publications such as *New York Times*, *National Catholic Reporter*, *US News & World Report*, and *FBI Law Enforcement Bulletin*. They included a fatwa (religious opinion from the perspective of Islamic Jurisprudence) that was given by North American Muslims against terrorism in 2005. Also reviewed were articles about the FBI dividing Muslim communities or advising other law enforcement officers to communicate in a specific way when dealing with the “Muslim” or “Arab” communities. A couple articles detailed public relation efforts by Britain and the United States. These articles were not in-depth scholarly research and therefore not worth mentioning in more detail.

Another seven scholarly articles, post-September 11, 2001, basically try to enlighten the masses about the situation and provide details on various aspects of the entire dilemma. Dr. Sedghi’s short article, *Muslims in the West’s Imagination: Myth of Reality*, and a book review on *What Do Muslims Want? a Voice from Britain* detailed the special needs and expectations of the Muslims. Very detailed articles were written by Geneive Abdo, University of Notre Dame, and Michelle De. Byng from Temple University. Articles by Nadine Naber, University of Michigan, and others like Rashad Hussain, Jennifer S. Livengood and Monika Stodolska all detailed the issues of civil liberties.
These articles explained the increased “effects,” “fear” and “complex inequalities” with titles such as *Islam in America: Separate but Unequal* to *The Effects of Discrimination and Constraints Negotiation on Leisure Behavior of American Muslims in the Post-September 11 America*. These articles were very informative and capturing but did not focus on what needs to be done and specifically what American Muslims should do to elevate themselves from their current miserable situation.

Just like the above research papers, three more documents focused on clarifying specific aspects of Muslims living in America. One article by Evelyn Alsultany details how advertising is used both by Muslims in America, Council on American Islamic Relations, and also by the U.S. government at an international level, and how American ideological identity is fluid and changing. She concludes that, “Despite these various ideological campaigns, U.S. Muslims after 9/11 must prove their loyalty to the nation for a chance at being imagined as part of the diverse national community.”

The next two documents are focused on education. James R. Moore provides an excellent piece, *The Role of Islam and Muslims in American Education*, on why Islam should be taught in the American educational system with a great hope that with deeper understanding we could all live in a better world. The other article is focused on *Educating American Muslim Leadership*, for hopes of a better future. Again, these articles should be appreciated and they are written for a better future, but for our research purposes, they were limited and did not provide any information on how a minority Muslim group should respond if not taken seriously by the authorities.
Another three very impressive and scholarly articles added to my knowledge. Ali Khan, Professor of Law at Washburn University-School of Law writes about *Advocacy under Islam and Common Law*. A truly eye-opener piece, in summary he speaks about how, “Advocacy in the United States has turned to manipulations whereas advocacy in the Islamic tradition has embraced militancy.” Both have suffered from their original roots, which he terms “advocacy as doctrine of justice.” Although much could be learned from Khan’s article, it focuses on legalities of advocacy from both traditions from a historic and theoretical perspective. Our research focuses on and tries to format the minority position in trying to advocate for their community.

The second article is by Karen Leonard, *American Muslims and Authority: Competing Discourses in a Non-Muslim State*. It discloses many facts about the current situation of Muslims in America and how there is a struggle within the leadership or those who have become the “spokesmen” for the American Muslim society. However, her article is simply presenting what is going on in the American Muslim arena, their leaders, their organization; it does not have much criticism or offer solutions that serve the specific research focus our paper has taken.

Similarly to Leonard, Qamar-Ul Huda documents the American Muslim community affairs, in specific, their organizations, and how all of the Muslim American organizations are contributing in a positive way. She concludes that “with such immense diversity in the American Muslim community, it is difficult to reduce it to a single voice. Instead, there needs to be a greater appreciation for the efforts and contributions of Muslims in the areas of conflict resolution….” This article is probably one of the best and most accurate descriptions of the American Muslim society. For the
purpose of our study, it does not have much value in illuminating the failures of Muslim organizations with solutions to be followed.

In the mix, we find an editorial, *We shall Overcome*, which explains the hunger strike of Dr. Sami Al-Arian. It speaks of injustices and how “Dr. Al-Arian symbolizes the ‘negro’ of this century....” This editorial, written by Eric E. Vickers, an attorney and civil rights activist, reveals something unique and new—a hunger strike by a Muslim American. This may become important in our research, because a hunger strike is definitely a tool that has not been used by American Muslims effectively.

Finally, Kathryn Abrams writes a critique of *The Anatomy of Disgust in Criminal Law*, entitled, “Fighting Fire with Fire” Rethinking the Role of Disgust in Hate Crimes. She disagrees with Professor Dan Kahan and concludes that the American Muslims are doing a wonderful job of outreach and educating the public, which is needed to help the American Muslim cause. This is an impressive argument and nothing really to disagree with. However, it is limited and does not discuss the problem presented when the government or public ignores you and your outreach and education does not work. Then what? This question is not addressed.

The eighteen articles that were not related to the subject covered a variety of topics including *Driving While Muslim*, which expresses the plight of Muslims post September 11th, 2001, *The Post-9-11 Hijab as Icon*, and various other issues encompassing gender, race, current news, discrimination, immigration issues, and human rights. In totality, the articles were of great value in their own subjects but did not add any value to our research and, therefore, are unworthy of discussion here.
Beyond scholarly and peer reviewed articles, there are many books covering many aspects of the subject. For example, *Good Muslim Bad Muslim* by Mhamood Mamdani is an excellent articulation of current political trends. *Who Speaks for Islam?* by John L. Esposito and Dalia Mogahed, explains through data various questions on the minds of the general American public. There are instructional books on how Muslims can get involved in politics by Raeed N. Tayeh. Other books discuss the unfortunate experiences of Muslims in America, such as *Civil Rights in Peril*, among many other texts. However, I have not yet found an article or book that is focused on effective American Muslim advocacy, the topic of our research.

**Literature Review Summary**

Much research has been undertaken and much has been written about the American Muslim community, especially after September 11, 2001. Given the ignorance of the general community about the Muslims in general and Muslims in America in specific, most of these writings are focused on providing information and clarifying issues and concepts. They are written for the general community about or on behalf of the American Muslim community.

Although it is important to recognize that such steps are necessary, it is also equally important that we focus on researching, critiquing, theorizing, writing and carving new directions for our American Muslim community to make sure it is successful and contributes positively to America as a whole. So far, in reading over forty articles and looking through many books, I have found none that provides the answer as to why, in the story related in the introduction, the Muslim students were not taken seriously by the administration. Why, when they used diplomacy the administration
ignored them for several days and when a threat of force was introduced, the administration then respond within just a few hours. Therefore, we find ourselves with no choice but to try to scratch the surface of this domain, or at least try to open the discussion in this field of study. This is the intent of this research.

Methods
This is a qualitative social science research. We used the concept of survey research with convenient sampling and, in specific, face-to-face interviews. We were interested in in-depth conversation, although we did not want to restrict the respondents for better validity; we wanted to have some structure.

Personal Interview
Because our research is what we term “quasi-experimental designs,” we used a nonschedule-structured system of interviews (D Nachmias, C. Nachmias 101).

We had a set of questions to ask our respondents designed so that the answers would indirectly or sometimes directly provide the data we were seeking to clarify the questions raised by the hypothesis. (See appendix)

The questions were open-ended, and we gave the subject as much time as they needed to respond. The interviewer did not stop or suggest a timeline for answers. This provided a full opportunity for the subjects to explain themselves in the depth they preferred.

The interviewer strictly followed a rule of conducting the interview in a place convenient for the subject. The interviewer went wherever the subject agreed to do the interview.
Interviewer
The interviewer took every precaution not to affect the interviews. The following rules were applied:
1. The interviewer will wear the same kind of outfit: formal pants, formal t-shirt and a tie.
2. The interviewer will carry a black carrying-bag similar to a business-type laptop computer case, which contains the recording device, a note pad, and some pens.
3. The interviewer will explain the process, have the subjects sign the consent form and begin the interview. The interviewer also will take measures not to direct any answers, only asking for clarifications or follow-up questions.

Subjects
There were between 4-5 individuals, all adults over 18 years of age. They consisted of decision-makers within human and civil rights organizations, mosques and governmental organizations such as police departments.

Sampling
We are fully aware of the issue of “representativeness of the sample” (D & C. Nichmias 252). However, we chose to go with a convenient sampling, given our limited research time and resources invested. We tried to choose a variety of different organizations that represent the Muslim community given our limitation. However, the police departments were chosen completely out of convenience. Other departments that were contacted did not respond, even when we tried to pressure them through various personal contacts.
Given all these dynamics, we still believe that we can generalize to some level given the specifications and complication of the various matters within the various minority communities that might be interested in benefiting from this research.

**Procedure for selecting subjects**
Given the type of research we were conducting, we used a convenient sample. We chose one direct or formal advocacy group, the Grassroots Support (GS), which is part of a national group, and one group which has an indirect form of advocacy within the Muslim community, a mosque and a community center, the Religious Services (RS) at a local level. And third, we chose a mosque connected to a movement or specific ideology with other branches that is drastically different from the above two, Community Empowerment Services (CES).

Additionally, we had two police departments to represent those in power as the governmental agencies. The Community Protection Task Force (CPTF) was used because it has had various encounters and a relationship with the Muslim community. The Priority Safety Team (PST) was chosen out of convenience, but it turned out that it had very little experience, communication, or relationship with the Muslim community.

**Grassroots Support (GS)**
We chose to interview a representative from the local chapter of the Grassroots Support. GS’s mission, according to its national web site is basically to bridge the gap of understanding and communication between the American Muslims and the general American community. The organization is recognized as one of the leading civil rights advocacy groups on behalf of the Muslim
American communities. It claims chapters in many states.

**Religious Services (RS)**
The Religious Services (RS) is a multicultural community service and religious organization that was established in 1978 with the goal of providing Islamic services to the community. Its main purpose is to serve as a mosque, and just like many other mosques in the United States, it has been forced to deal with many problems of its community members; therefore, it is involved in the community at large in various capacities. It has a relationship with various law enforcement agencies and governmental entities.

**Community Empowerment Services (CES)**
Community Empowerment Services is an African American mosque and community center. A former representative with a decade of experience in dealing with that community was chosen to represent an alternative viewpoint to that of the mainstream Muslim American community. This group was chosen for two purposes: first, to serve as a control group, and, second, to present a different view that many may agree with but dare not speak about.

**Community Protection Task Force (CPTF)**
The Community Protection Task Force (police department) has had heavy involvement with the Muslim community since September 11, 2001. The chief of police has gone beyond the call of duty to understand this community and build a relationship that will be beneficial to both the police department and the Muslim American community. Also, given the personal connection of the author of this paper with a close friend of the department, there was a good possibility of getting an interview with this department.
Priority Safety Team (PST)
The Priority Safety Team (also a police department) was chosen simply because it was convenient to do so. We found a personal connection to the head of the department which made it easy for us to get an interview with this department. However, it was a perfect addition to our research because the department has had very little communication with the Muslim community as opposed to our previous police department, CPTF.

Note: It should be mentioned that we did invite many other police departments which would have been very beneficial to this study given some incidents (could have been used as case studies) or experiences they had gone through with the Muslim community. However, without providing any specific reasons, they refused to participate in our research.

The rationale for employing the types of subjects selected for the study was the following. We chose specific advocacy groups, mosques and a governmental organization such as a police department because, when an issue or phenomena arises, both of these groups are present and both are important.

We chose two advocates for the specific community (i.e., Muslim community) and the two police departments who advocate for the general community with safety rules and regulations to be followed (also representing the administration). A third Muslim group was added that refuses to negotiate with governmental agencies. This group was largely used as a control.

There were no direct benefits for the subjects from participation in the study. The indirect benefit may be general feelings of reward
There were no anticipated risks to any subjects from participation in the study aside from the risks that are usually encountered in daily life. The participants were interviewed; the impact of this was equal to that of a journalist asking them questions on matters pertaining to their work.

Each of the subjects signed a consent form and knew that they did not have to answer any questions with which they were uncomfortable and that they had the complete right to stop the interview at any time. The subjects were interviewed in an environment-friendly atmosphere, such as their homes, places of study, places of worship, or their office, whichever they felt most comfortable with.

No compensation was awarded to subjects for participation in the study.

All individuals interviewed are necessarily identified by name in field notes in order to maintain the accuracy of interviews and, therefore, research at large. However, all names, if used (and department or organization names) were converted to pseudonyms in any reports and papers that others read. We respect our subjects and have taken all the precautions to make sure that personal information of the subjects being interviewed are kept confidential to everyone except the researcher, Hanif Mohebi, who did the field research and mentors and other contributors to this paper.

**Materials and Devices**

A standard, old fashion, audio recording machine was used to record the interviews. During the interviews the investigator took
notes with a pen or pencil on regular standard lined paper.

**Procedures**
The subject arrived at the specific location agreed upon and met the investigator. They listened to the rules and regulations of the interview, including their confidentiality and the choice to stop the meeting at any time. They were notified that the interview would be recorded by audio only. They signed a consent form. Then the recording and interview began. The subjects answered various open and closed ended questions pertaining to the subject of research.

The investigator conducted the research at whatever location the interviewer chose. The subjects had full choice of the location for the interview, such as their office, outside in a coffee shop or in an academic classroom. The research was conducted by Hanif Mohebi under the supervision of professor Montojo.

**Results**
Qualitative research results analysis is difficult, especially when resources are limited. In order to make sense of matters presented, the author will have introductory points; however, matters of interpreting are left to the discussion section.

We have basically used categorization in order to analyze the results. We have used the following categories: Definitions, Current Advocacy Status, Soft Power, Hard Power, and Smart Power. Each one is presented in this section.

**Definitions**
To make sure that everyone was talking about the same thing with the same general definition, the subjects were asked to define
Diplomacy
The formal definition taken from online Merriam Webster’s Dictionary is “the art and practice of conducting negotiations between nations; skill in handling affairs without arousing hostility.” Most of the subjects agreed with few comments. (Check Table 1.1)

<table>
<thead>
<tr>
<th>Orgs</th>
<th>Neg. bet 2 parties</th>
<th>Without arousing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>RS</td>
<td>Yes</td>
<td>Yes</td>
<td>Getting their rights to the best of their ability</td>
</tr>
<tr>
<td>CES</td>
<td>Yes</td>
<td>Not Clear</td>
<td>Basis of diplomacy is to repel evil with good</td>
</tr>
<tr>
<td>CPTF</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>PST</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Therefore, the definition of diplomacy that will be accepted is negotiation between two parties without arousing hostility to resolve a matter and give the rights of individuals accordingly.

Muslim American
There was no definition found in the dictionary for Muslim American or American Muslim. The question was asked, “Define American Muslim or Muslim American?” In general, there was an agreement that Muslim Americans are Americans who are Muslim by faith. Further comments were made with a qualification put by one Muslim ‘leader’ as “Muslims live in America and understand what it means to be an American.” (Check table 1.2 for details)
<table>
<thead>
<tr>
<th>Orgs.</th>
<th>Americans who are Muslim by faith</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>RS</td>
<td>Yes</td>
<td>Muslims live &amp; understand what it means to be American</td>
</tr>
<tr>
<td>CES</td>
<td>Yes</td>
<td>Muslims living in America</td>
</tr>
<tr>
<td>CPTF</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>PST</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Administration**

Once again, we wanted to make sure that we are all on the same page when we talk about the government. The following was presented, with remarks such as “difficult to deal with.” For further details and comparison of answers please look at Table 1.3.

<table>
<thead>
<tr>
<th>Orgs.</th>
<th>Managing Government</th>
<th>Bureaucracy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS</td>
<td>Yes</td>
<td>Yes</td>
<td>Difficult to deal with</td>
</tr>
<tr>
<td>RS</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES</td>
<td>Yes</td>
<td>Yes</td>
<td>Gov. institutionalizing dominant paradigm, Imperialism</td>
</tr>
<tr>
<td>CPTF</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PST</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Therefore, the definition that will be accepted for “administration” is a body that manages the affairs of the government, a bureaucracy that it is difficult to deal with.

**Current Advocacy Status**

Specific questions were asked to find out if the current advocacy is effective or not fully effective and simply to find out the current
status. For the questions, please check Appendix A provided at the end. The desired relationship in general was to be understood and respected, for both parties to win and for everyone to have a peaceful relationship based on respect and understanding. The question was asked, “Currently, do you feel the desired relationship that you’re seeking is achieved?” Overwhelmingly, the answer was no, except in one case, where the police department felt that they had achieved their desired goal. For further details please check Table 1.4.

<table>
<thead>
<tr>
<th>Current Advocacy Status: Table 1.4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Orgs</strong></td>
</tr>
<tr>
<td>Q1: Desired relation w/other</td>
</tr>
<tr>
<td>Q2: Desired relation achieved</td>
</tr>
<tr>
<td>Q3: tools used to achieve relation</td>
</tr>
<tr>
<td>Q4: ur consultant in other party</td>
</tr>
<tr>
<td>Q5: Use both Diplomacy &amp; Litigation</td>
</tr>
<tr>
<td>Q6: Changes 4 further success</td>
</tr>
<tr>
<td>Q7: Best desired outcome achieved by</td>
</tr>
<tr>
<td>Q8: failure: both want same or different</td>
</tr>
<tr>
<td>Q9: Communication line open</td>
</tr>
</tbody>
</table>
**Soft Power**

All the subjects agreed that Muslim Americans have much in common with the general Americans. Four out of five subjects did not feel uncomfortable with Muslim ideology, life, and community. One subject pointed out that “if you do not know, and then you worry.” For further details please check Table 1.5.

<table>
<thead>
<tr>
<th>Soft Power Table 1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Organization</td>
</tr>
<tr>
<td>Q1: Muslim Amr. + General Amr have much in common</td>
</tr>
<tr>
<td>Q2: Do u accept religious rulings of Muslim Faith</td>
</tr>
<tr>
<td>Q3: Uncomfortable w/ Muslim ideology, life, community</td>
</tr>
<tr>
<td>Q4: Admire Muslim life, ideology, community</td>
</tr>
</tbody>
</table>

**Hard Power**

The police departments appeared to have more resources than the other groups. Muslim lobbying was ranked low by all the subjects. In general, the campaign contributions by Muslims were also ranked low. One organization mentioned that campaign contribution at “local level is good, but at the nation level it’s not.” The answer to other questions varied by each subject. For further details, please check Table 1.6.
### Hard Power: Table 1.6

<table>
<thead>
<tr>
<th>Orgs</th>
<th>GS</th>
<th>RS</th>
<th>CES</th>
<th>CPTF</th>
<th>PST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q1: Resources, &amp; access to it</strong></td>
<td>limited finances community access (yes)</td>
<td>mosque (implied limitation)</td>
<td>limited</td>
<td>Dept. of 1800 pple, 364 days a year</td>
<td>Chose of 1800 pple, 364 days a year</td>
</tr>
<tr>
<td><strong>Q2: How do u get pple to contribute to your Org</strong></td>
<td>we offer them services</td>
<td>N/A</td>
<td>faith building</td>
<td>Community Policing</td>
<td>Connected with community</td>
</tr>
<tr>
<td><strong>Q3: Rate Muslim Lobbying 1-10</strong></td>
<td>four (4)</td>
<td>N/A</td>
<td>1 (be lobby = bribe)</td>
<td>not much at all</td>
<td>Don’t know any Muslims</td>
</tr>
<tr>
<td><strong>Q4: Rate campaign contribution of Muslims vs. other successful group.</strong></td>
<td>locally good/nationally no</td>
<td>N/A</td>
<td>very low</td>
<td></td>
<td>Don’t know</td>
</tr>
<tr>
<td><strong>Q5: Who u deal with in other party</strong></td>
<td>Top level, chiefs of Police Dept etc.</td>
<td>No (no politics)</td>
<td>one I trust (RS)</td>
<td></td>
<td>N/A don’t know</td>
</tr>
<tr>
<td><strong>Q6: Political Aspirations of ur group</strong></td>
<td>equal representatio n</td>
<td>fairness, justness</td>
<td>self determination</td>
<td>Education</td>
<td>Don’t know claim ignorance</td>
</tr>
<tr>
<td><strong>Q7: What tools u use to advance ur cause</strong></td>
<td>media (dipl., litigation)</td>
<td>education</td>
<td>people power, institution s</td>
<td>Organized in subgroups</td>
<td>Create relationship (N/A)</td>
</tr>
<tr>
<td><strong>Q8: Are ur tools means, resources effective</strong></td>
<td>to some extent</td>
<td>don’t know</td>
<td>always effective</td>
<td>just the beginning</td>
<td>Different Not effective</td>
</tr>
</tbody>
</table>

**Smart Powers**
The general tools that were used were contributed to diplomacy. The question “In general is your tactics/procedures/tools effective when used in combination or separately?” Without exception, all subjects replied that it was the combination of the tools used that was effective.
Other answers varied. Please check Table 1.7 for further details.

<table>
<thead>
<tr>
<th>Smart Power Table 1.7</th>
<th>GS</th>
<th>RS</th>
<th>CES</th>
<th>CPTF</th>
<th>PST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: Success Case</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes (other minorities)</td>
</tr>
<tr>
<td>Q1(a): tools used for success</td>
<td>diplomacy (implied litigation)</td>
<td>diplomacy</td>
<td>protest, people power</td>
<td>Communication fully and sincerely</td>
<td>building relations</td>
</tr>
<tr>
<td>Q1(b): r u duplicating such efforts 4 further success cases</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No, don’t have time</td>
</tr>
<tr>
<td>Q1(c): got all u wanted thd case</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Absolutely</td>
</tr>
<tr>
<td>Q2: Failed Case</td>
<td>Yes</td>
<td>N/A</td>
<td>No</td>
<td>(no interaction with other party)</td>
<td>Yes</td>
</tr>
<tr>
<td>Q2(a): tools used for failed case</td>
<td>other party ignoring us, no comm..</td>
<td>N/A</td>
<td>N/A</td>
<td>not being upfront</td>
<td>relationship, no connection was made</td>
</tr>
<tr>
<td>Q2(b): r u avoiding such efforts for best results</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>yes (implied)</td>
<td>N/A</td>
</tr>
<tr>
<td>Q3: tools effective in combination or separately</td>
<td>always combination</td>
<td>combinati on, friendship</td>
<td>Combination</td>
<td>Combinati on</td>
<td>Combination</td>
</tr>
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</table>

**Discussions**

**Summary of Conclusions**
Completing this research has provided us with some answers; it also has opened the doors to many other questions to be researched further. Some of these questions will be discussed at the end. We
find that the majority of the subjects agreed on definitions of diplomacy, Muslim American and Administration with some worthy comments to be considered or discussed.

The African American Muslim group commented that, “The basis of diplomacy is to repel evil with good.” This statement perhaps is very basic and simple, but in its depth it has quite a lot of hidden and implied meaning. In trying to remove evil with good, one sometimes has to be hostile. A drunken man dancing in the middle of the street, for example, has to be removed by the appropriate authorities, even by force, in order to save his life. The implication from the definition of diplomacy as repelling evil with good leaves the door to hostility open for the greater good.

The results of this research indicate two kinds or strings of leadership—unconventional and conventional. On the one hand, there are those who distrust the government and are not willing to communicate or work with the government at all. This leadership string demonstrates an unconventional leaning. This trend is backed by the specific African American Muslim group, Community Empowerment Services, in this research. On the other hand, there are those who uphold the historical and political idealisms of America and are willing to communicate and work with the political system. This leadership style demonstrates a conventional style. This trend was backed by the two other Muslim organizations that were interviewed.

The evidence of the conventional approach is apparent when one of the Muslim organizations or leaders added the qualification to being an American Muslim as, “A Muslim that live(s) in America and understand(s) what it means to be an American.” This identity gives us an idea of how much American Muslims respect and hold
the theoretical and historical American ideal citizen as a model. The evidence of this could also be found in various other initiatives that these organizations hold or support.

For example, conventional-leaning organizations believe in the democratic system of this country, and they are actively involved in promoting political participation. They truly believe that they can bring about a positive change through the system. These organizations actively communicate and work with the government, a trend consistent with traditional research. As support for this, we have American Muslims who became consultants to the White House post 9/11 (Huda 187-200). Hamza Yusuf, an American Muslim met privately with President George W. Bush on September 20, 2001. Other confirmation of this fact goes even further as one American Muslim political scientist writes about the U.S., “the most Islamic state that has been operational in the last three hundred years.” (Leonard, 13)

This trend is mostly held by the American Muslims who have migrated from various parts of the world and now call America home, and also by other American Muslims like Hamza Yusuf, an indigenous American of white background. This trend or group has a different relationship, experience, understanding, and frame of reference of the American system than those of African American background.

Professor Leonard in his article, *American Muslim Authority: Competing Discourses in a Non-Muslim State*, clarifies some of these differences and illuminates more about the second trend of leadership within the American Muslim community. He writes of why African Americans split from the national umbrella organization, Islamic Society of North America (ISNA) and
created the Muslim Alliance of North America (MANA). The “focus on overseas agenda, and their efforts to become part to the dominant or white mainstream culture” did not resonate too well with the African American Muslims. (21)

Dr. Sherman Jackson, from the African American Studies Department of University of Michigan, and Muslim by faith, has been very vocal about some of the American Muslims (who are part of the first trend of leadership) believing too much in “false universalisms” of America. “The American Muslim romantics” who are basically with the system have forgotten that Islam in general is a religion adaptive to time, place, and context without compromise. He essentially warns of half truths, the “East’s truth” about Islam. Dr. Jackson clarifies that Islam in America “has to be bold and vigilant in its refusal to ignore or jettison any of these histories and experiences in favor of appeals to false universal, no matter how chic, powerful, or expedient the latter may be.” (Leonard, 21)

Our study is also consistent with the above findings, although in its extreme forms. It should be clarified here that even within the African American Muslim community one can find both trends of leadership. Zaid Shakir is an African American Muslim associated with the Zaytuna Institute, which is part of the first trend, the conventional participation and leadership. (Moyers, 2007).

Our study finds the other trend of leadership held by the African American Muslim group that was part of the research, throughout the study stands out as a “strand of leadership” that does not want to deal with, communicate or negotiate with the forces of government as it was predicted in the beginning. The group clarified this point in the interview in the following manner:
In the African American Leadership tradition, there have always been two strands of leadership. One strand of leadership advocated no negotiations or contact with the system, no interaction with the system at all in terms of we sit down, negotiate and so forth. There is another strand of African American leadership that would sit down. In recent times, two leaders that best personify those two strands of leadership are Malcolm X and Martin Luther King. Malcolm always takes the position that there were no negotiations, that basically we have nothing to talk about, I know who you are, I know that you will be deceitful, that you are corrupt and so forth, that you are going to lie, so there is no need to even talk to you. Dr. King will engage in dialogue in those systems. Both strands are necessary. But I represent the strand of leadership that is characterized by Malcolm X.

When the subject was further asked why the balance was necessary, he explained that a balance was essential to success; however, he qualified that both of the strands had to be independent of the government. With both being independent of the government, then “there is cooperation between the two strands of leadership.” So in summary, for this trend actually to be fully effective, it has to communicate through the trend that communicates with the government; another words they are interpedently. This indicates that there has to be some kind of verbal or nonverbal, direct or nondirect communication, between these two trends of leadership. Currently that is not present. Perhaps this is one of the reasons why both the trends are not as successful as they could be.
It is important to note that the one trend of leadership (conventional) is using what we have termed diplomatic advocacy; our study also proves this point to be true. When we asked the two non-African Muslim groups what tools they used to achieve their desired goal, the general answer was diplomacy, either through “outreach” or other outlets. The two police departments had the same understanding of diplomacy; basically sitting down, “breaking bread” and going to “museum” to understand one another and reach their goals. (Table 1.4, Q3)

On the other hand, the second trend of leadership the African American group is using is what we have termed unconventional advocacy. They do not want to compromise; they don’t believe in the system. Confirmation of this point is also found in our study. (Check Table 1.4 question number 3 again)

First Hypotheses
According to our study, the current advocacy status has failed. All three Muslim organizations that were asked if they had achieved their desired relationship or goal answered, “No,” (Table 1.4). This point proves that our first hypothesis is true: In general, if the desired advocacy relationship outcome is not achieved at the present time, then the current use of tools, tactics, and diplomatic advocacy (soft powers) is not effective.

Why is it that the diplomatic advocacy efforts used by the first two Muslim organizations, representing the first trend of leadership (which works with government) have in general failed? At the same time, why is it that the traditional advocacy used by the third Muslim group representing the second trend of leadership (not working with government) in general has also failed?
Could it be true that American style diplomatic advocacy did not work because American advocacy is all about “manipulation?” And is it true that traditional advocacy did not work because within Islam in the American context it has become or perceived as “militant.”

Ali Khan, professor of Law at Washbrun University, in his extensive article, *Advocacy under Islam and Common Law*, explains that in both Islamic and common law, “advocacy arose as a reformist doctrine,” trying to restore justice. Unfortunately, he further explains that “Advocacy in the United States has turned to manipulation whereas advocacy in the Islamic tradition has embraced militancy.” (1-3)

**Soft Power / Diplomatic Advocacy**

The study indicates that Muslim Americans have some “soft power,” at least when there is a communication between the Muslims and other parties. One of the police departments that has had some connection, communication, and has been exposed to the Muslim community was asked, “What aspects if any of Muslim way of life, ideology, or community do you feel uncomfortable with?” He answered, “None. Like I said, most of them are just being the ideal American family, I mean it gets back to the family….and I appreciate that.” Again when he was asked what he admired about the Muslim community, he also made it clear that he did admire not only the family life but also their dealings. (Table 1.5)

On the other hand, the department that had no connection, when asked the same question if they felt uncomfortable with any aspect of Muslim life, had an interesting and revealing answer. After admitting that they did not know much about the community at all,
he indicated that, “If you don’t know, you worry about offending people.” What is so revealing about this statement is that, if you don’t know about something, you worry, period. This feeling of worry can bring various forms of psychological, emotional, and other types of responses that may lead to hostility.

We gather from these points that when Muslim Americans expose themselves, communicate, interact and become part of the community, the community in return has great admiration (which is soft power) for them. Besides the media and general political framing, at a community level it could be said that although Muslims have some soft power, especially at the local level, it could be strengthened, enhanced, and there is much to improve on this front. They do not need to change any specific aspect of their life or anything (this is only if they are actually practicing Muslims and are presenting Islam in its correct form; no extremes); they simply need to start communicating with people, start “breaking bread” and “building relationships” with people around them.

**Hard Power / Traditional Advocacy**

The study also finds that the Muslim American community has very little hard power. I was unaware of any noteworthy existence of any hard power in the American Muslim community in terms of military, or organized groups with weapons, etc. Therefore, hard power here is used in terms of resources, lobbying, and money given for campaign contributions, according to the book *Soft Powers* by Dr. Joseph Nye. (5)

In this aspect, we find that Muslim Americans have failed miserably. Everyone that was interviewed in the study agreed and rated Muslim lobbying and political contributions at a very low level. Also, we find that the Muslim organizations were struggling
with resources, while the police departments interviewed had a sizeable resource available to them. One of the Muslim organizations interviewed summed up this issue for the majority of the Muslim organizations as, “financially, I think a lot of organizations are struggling.” In contrast to that, one of the police departments proudly concluded that “we are a department of 1800 people, and we are all over the community. (Table 1.6)

American Muslims must realize that they need to remedy these problems if they want to be successful in this country. Their institutions must have a strong financial background and backbone, (this does not mean only depending on donations from members; they must find other stable means; this could be discussed in some other article in details in future), structure, and base. They need to build a strong and exemplary lobby, although with utmost adherence to the Islamic understanding of justice; they cannot use the same negative strategies that conventional lobbyists use. They must strengthen their campaign contributions, again cautiously, and, if they feel that they do not have the right person, then at least at the local level they should have Muslims run for government offices and back them up financially.

Not recognizing the importance of hard powers, the Muslim American community also has not put much emphasis in using litigation as an effective tool to further their cause. This is not to deny that there are groups trying to do exactly that. However, given their limited resources they are not able to use this tool as effectively as they could.

It is clear from the above that American Muslims should work on strengthening their hard power structure. They have to build strong exemplary and just lobbies, they must strengthen their
political participation and campaign contributions, and they must learn to allocate proper resources to the process of litigation. At this time, the author is hesitant to promote hard power in terms of physical powers such as a militant group with all its dynamics.

But community visionaries, academics, and writers should not limit their planning for the centuries to come. They must create an entity that can in the future defend not only their community’s rights but the rights of any oppressed community or unjust laws, as a last resort obviously, when all the other venues have been explored and no diplomatic efforts are capable of solving the issue. In this context, American Muslims should not shy away from exercising their constitutional right, the second amendment, to defend themselves (William, 1998). In this aspect, African American Muslims would be resourceful because many of their leaders were part of “militant Black Nationalists and Pan Africanists before converting to Islam (Al-Islam, 77).” As much as there is a need for the community not to limit themselves and think comprehensively, one must warn, however, that the time has to be right for this step to be taken.

For the time being though, a great form of hard power would be non-violent acts of civil disobedience, which is basically a formal threat of force with no violence. The community should be fully trained and educated in this matter. The Muslim community has so much to learn from the historical struggles of the 1960s, specifically from the African American Muslim community. Also, we could learn much from the historical struggles of environmentalists and other advocacy groups using various advocacy techniques. Civil disobedience should be used as a form of traditional advocacy, a threat of force upon necessity when
diplomatic advocacy strategies fail. Once again, in civilized society one should employ such tactics as a last resort.

**Smart Power or Smart Advocacy**

In general, our study finds that tools are more effective when used in combination. All the subjects of this study unanimously have responded that combinations of tools are more effective in trying to achieve one’s desired goal (Table 1.7, Q3). Future studies should bear out this point.

**Hypothesis Number Two**

If the above findings are true that a combination of tools is more effective, then our second hypothesis (If the principles of diplomatic advocacy [soft powers] are coupled with the principles of traditional advocacy [hard powers], then the advocacy shall be effective) should also be true.

**Hypothesis Number Three**

Our study has not given us any solid evidence that if the same entity uses two paradigms or trends of leadership at the same time it would be effective or not effective. However, we conclude this from the above story of the university students that used diplomatic advocacy and traditional advocacy in terms of civil disobedience to resolve their issue and found that, although they were open to any kind of communication and diplomatic efforts and were ignored, when they used threat of force, they were looked at as the trouble makers. And so, based upon this story, we can conclude that our third hypothesis, (If the two paradigms (diplomatic and traditional advocacy) are used simultaneously by the same entity, then the results will be largely negative), is potentially true; however at this specific time our research is limited and we cannot provide more information and data to back this claim.
**Theoretical Relationship**
This study has been heavily dependent on Dr. Joseph S. Nye’s work on soft, hard, and smart powers. Dr. Nye, as well as many others scholars, would agree that soft power or hard power used alone would not give the best results. The combination of both soft and hard powers is used in international politics all the time. Dr. Nye says in his article, *A Smarter Superpower* that “America needs to combine hard and soft power into ‘smart’ power, as it did during the Cold War (46). Our research is encouraging academics to appropriate Dr. Nye’s theories of international relations and politics to also be used at local and national level. This study is proposing that it is not enough to use diplomatic advocacy, or traditional advocacy alone, for best results, they must be used together in right proportions, sequence and procedures.

For example, the students in the university case used diplomatic advocacy and they were ignored. What was the reason? They basically were so powerless that the university officials did not take them seriously; in other words, at the negotiation table they were not at the same level and therefore diplomatic advocacy was not effective. After they had tried diplomatic advocacy and it had failed, they resorted to traditional advocacy (threat of force), and the university responded quickly. Why?

At that point the students had demonstrated that they were not as weak or as insignificant as they were envisioned. In a sense, they had lifted their status a little bit closer to the administration on the negotiation table, so that they were then taken seriously. At the same time, they could not be blamed by the university because they had already explored a more “civilized” way, which was the diplomatic advocacy. Therefore, it was the combination of these
two paradigms—diplomatic and traditional advocacy—which equated to smart advocacy and allowed them to achieve their desired goal.

The incident of the university students is not an isolated case. One of the Muslim organizations that was interviewed presented a similar situation. At one point they said, “We get the best outcomes when we are starting at the same place.” Speaking about a specific case, they mentioned that they were “not able to set up a meeting with Department of Homeland Security or the FBI, even through the department of civil rights, the investigative department.” When asked for further explanation they mentioned, “It comes back to the power structure, the power imbalance between the organization or even the whole community coming together, and you know it being a governmental department, FBI department and the Department of Homeland Security.” This is strong evidence that such incidents are happening at the highest levels, and it is probably not limited to the Muslim community; many other minority communities suffer from the same symptoms.

Using smart advocacy will be useful in such incidents. There is much historical evidence for this recommendation; one of the undeniable reasons that Dr. King’s use of diplomatic advocacy in the civil rights movement of 1960s was taken seriously was because the alternative was Malcolm X who represented the traditional advocacy. It was the combination of both, smart advocacy, that brought about the successes. Even in India, where Ghandi was struggling to free India from the British forces, there were people who were using traditional advocacy, which again raised the level of Ghandi in the negotiation tables, because once again the alternative was much worse. For those who are interested, they could read about the event that took place on
February of 1922 in the town of Chauri Chaura which halted Gandhi’s Non-cooperation movement.

At an international level, there are scholars arguing for a peace movement in Palestine. Again, this is because they recognize that just having a Hamas as a hard power alone has not been effective. There needs to be a balance between this hard power and an entity, free and independent from the forces of power, which has the people power that could be dealt with in a diplomatic way. For those who are further interested in this subject, they can start reading the short article that was printed in Fellowship Magazine, A Nonviolent Approach to the Intifada, by Raed Abusahlia.

Finally, the core idea of smart advocacy is not something new. In the 1900s, Theodore Roosevelt, the 26th President of the United States, said “Speak softly, and carry a big stick; and you will go far.” The Muslim American community, as well as other minority communities should take this advice to heart and perhaps look into further research about smart advocacy as a way out from their miserable situations.

**Implications: Theoretical / Practical Implications……the Big Picture.**

On a theoretical level, questions arise from what is being presented here. Should the minorities, such as the Muslim American community, build up hard powers or traditional advocacy and therefore start a rebellion, a revolution, if they don’t get what they want? Is this a green light to break the laws of the land and bring about chaos? Is this an indirect ‘jihad fatwa’ against the system? If this is not the case, then what is?
This is certainly not a fatwa for jihad. However, this paper is written to remind Muslim Americans of the importance of speaking truth to power with wisdom, and being firm about it; and, if they are not taken seriously, then they should apply new tools, such as smart advocacy, instead of either diplomatic or traditional advocacy. If this is done sincerely, with the right intentions, then people will recognize the justness and will support the community’s efforts in gaining their desired goals.

The intent of this research is to redirect the attention of not only the Muslim Americans, other minorities, but also the general American public about standing for just laws. Muslims are commanded by their religion to stand firmly for justice, even if it is against their own interest (Quran, 4:135). “The more unjust the system, the more useful is reformist advocacy (Khan, 8).” The idea of standing for justice is not reserved for Muslims only and is understood by many, including Christians.

Dr. Martin Luther King in his Letter from Birmingham clearly spoke about breaking laws in the following manner: “There are two types of laws: just and unjust. I would be the first to advocate obeying just laws. One has not only a legal but a moral responsibility to obey just laws. Conversely, one has a moral responsibility to disobey unjust laws.” I would agree with St. Augustine that "an unjust law is no law at all." Now, what is the difference between the two? How does one determine whether a law is just or unjust? A just law is a man-made code that squares with the moral law or the law of God. An unjust law is a code that is out of harmony with the moral law. To put it in the terms of St. Thomas Aquinas, “An unjust law is a human law that is not rooted in eternal law and natural law. Any law that uplifts human
personality is just. Any law that degrades human personality is unjust.”

There are a lot of other implications. The community that stands against any power structure is not going to be appreciated or fully understood, and they might even be called extremists. A quick look at history will give us many examples. Reverend Thomas Hooker who advocated for “what was considered radical views on both religious and political liberty” at the time was not appreciated and is now considered a hero. Thomas Paine was part of “sons of liberty,” an extreme group for the government of the time, now a hero. (Wilson, 5-13)

There are many other examples. Patrick Henry is believed to have said, “Give me liberty or give me death.” Malcom X, and even Dr. King were considered extreme by some people, however now they are our heroes. They are the reason why America is beautiful. To continue this path, Muslim Americans must come up with workable strategies to reach their final goal, which has to be based on the highest forms of justice.

**Summary: Results /Conclusions**
The results indicate that diplomatic advocacy is not always effective, and therefore there is a need for traditional advocacy to be used as a last resort. However, we find that if the same entity uses both diplomatic and traditional advocacy simultaneously, it may give them a negative image. This research is suggesting that to be fully effective, independent organizations (conventional and unconventional strands) need to work and communicate either directly or indirectly with one another and a smart advocacy ideology should be used by Muslims or any other minority groups.
Conclusion
In cases where diplomatic advocacy fails, traditional advocacy should be applied by a different entity within that community. The proper use of both diplomatic and traditional advocacy is smart advocacy. Muslims should look into using smart advocacy to achieve best results when seeking a desired goal.

Limitations
Unfortunately, there are many limitations to this research. The resources allowed for this research have been minimal. This research has been using a convenient sample, and the sample is too small. Also, the results should probably be quantified for further understanding. Further research should be done on the last hypothesis of using both diplomatic and traditional advocacy simultaneously by the same entity.

Acknowledgements:
Without the support of the following individuals this paper would not have been possible. Thanks to Jeannine Slater, Nisha Gurbuxani, Brohne Lawhorne, Kenneth Faulve-Montojo, and my family and friends. Special thanks to SJSU McNair Scholars Program for making this research possible. Without all of you, my existence will not be felt.

Notes:
1 Hanif Mohebi, graduate of San Jose State University in Communication Studies, aspiring for a PhD program in social sciences. Born in Afghanistan and raised in the heart of Silicon Valley in California. A passionate Muslim American, with great love for civil rights and human rights. He is currently directing a
2 Dr. Ken Montojo earned his Ph.D. from University of California at Santa Barbara. His specialties are international and comparative political economy, with an emphasis on Southeast Asia. San Jose State University, Dept. of Political Science; Kenneth.faulves-montojo@sjsu.edu

3 There are many good references in the bibliography of the book Deeper Roots by Abdullah Hakim Quick for those interested in this topic.

4 Merriam Webster Online Dictionaries
Appendix A
Partial List of Questions Asked

Definitions:
1. How would you define diplomacy?
2. Define American Muslims or Muslim American?
3. Define Administration, government (dominant paradigm)?
   Use examples if necessary?

Current Advocacy not fully effective:
1. What is the desired relationship that you are seeking (with/other party)? (Other party: either police department (government) or Muslim organizations depending who is answering the question).
2. Currently, do you feel the desired relationship that you’re seeking is achieved?
3. What tactics/procedures/tools have you used to achieve them?
4. When a problem arises, who (individual, org, group) do you consult with from the other party?
5. Do you use a combination of diplomacy and litigation (arresting)? If yes, give examples.
6. What changes do you think should be made to your tactics/procedures/tools to achieve the desired outcome or relationship?
7. What do you think is the most effective manner of achieving the best desired outcomes?
8. If the results are not achieved in a particular case, why do you think that was the case? Did both parties want something similar or drastically different?
9. Do you think that the lines of communication are open at all times for you to get in touch with the other party; or do
you think it could be enhanced? (How could it be enhanced?) failure

Smart Power
1. When trying to solve a problem, do you have any success story with the other party? If yes, please explain. (Why did your strategy work?)
   a. What combination of tactics/procedures/tools did you use that the case succeeded?
   b. Are you trying to duplicate such efforts to achieve the best results in other cases (why/why not)?
   c. Did you get all you wanted in that case?
2. When trying to solve a problem, do you have any failure story with the other party? If yes, please explain. (Why did your strategy not work?)
   a. What combination of tactics/procedures/tools did you use that the case failed?
   b. Are you trying to avoid such efforts to achieve the best results in other cases (why/why not)?
3. In general, are your tactics/procedures/tools effective when used in combination or separately? Failed?

Soft Power
1. Do you feel that Muslim Americans have much in common with average/general American communities? If yes, is it projected in that light?
2. Do you accept the religious rulings of Muslim faith?
3. Which aspects if any of Muslim way of life, ideology, or community do you feel uncomfortable with?
4. What if any aspects of Muslim way of life, ideology, or community do you admire?
**Hard Power**

1. What kind of resources does your community, organization/department have? Do you have full access to it?

2. What mechanisms do you use to get people to contribute to your community, organization/department?

3. In lobbying, where would you rate the Muslim American community compared to any successful community that you know of? (rate 1-10; 1 being the lowest, 10 being the highest).

4. How would you rate the political campaign contributions of the Muslim Americans compared to a successful community that you know of?

5. Who are the key individuals in the other party that you need to deal with?

6. What are the political goals and aspirations of your organization and the community that you represent?

7. What are the means, tools and resources that your organization or community uses to achieve the goals discussed in question 3? In other words, what do you do to advance your cause?

8. Are these means, tools, and resources effective? How and why/why not?
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**The Relationship between Caffeine Consumption and Self-harm Behaviors: A Pilot Study**

**Biography**
Martha Nicolas is originally from Salinas, a growing farm town one-hour south from San José. She came to San Jose to obtain her nursing degree. However, she found that she enjoyed the psychology major, too. In 2008, Martha completed her psychology major and is now working to complete her nursing major in the Spring of 2009. She plans to combine both majors to fully understand clients in the hospital and the community. Her future plan is to continue her education into graduate school. She hopes that her three children will pursue the same avenue and reach their full potential.
The Relationship between Caffeine Consumption and Self-harm Behaviors: A Pilot Study.

ABSTRACT

The trend of consuming caffeinated beverages on college campus has increased in the past decade. In addition, according to past studies self-harm behaviors have also been increasing for young people in the past decade. Research has suggested that by decreasing caffeine in the diet there may be a decrease in anxiety, which is usually found with people whom self-harm. The purpose of this study was to analyze the relationship between the amount of caffeinated drinks consumed and self-harm behaviors. The participants for this study were all nursing students who were in their last year of their nursing baccalaureate program. Results were inconclusive; however, the data suggested the nursing students in our sample who consumed more caffeine reported more self-harm behaviors.

Keywords: self-harm, self-injury, self-mutilation, caffeine, and nursing students


**Introduction**

Currently, there is a lack of research comparing caffeine consumption and self-harm behaviors. In this pilot study, the purpose was to assess nursing students’ caffeine consumption and compare the amount to self-harm behaviors. As a college student who daily observes peers, it is easy to see college students drink caffeinated beverages daily. There are a variety of caffeinated beverages readily available on college campuses. Because caffeinated beverages are so accessible to students, it seems that these drinks are a norm trend. The sensation, which is stimulating, may become addicting. The findings by Jones and Lejuez (2005) supported that sensation seeking was a tendency with drinking caffeinated drinks. Perhaps students may believe these beverages help them stay awake to study. There are various drinks that contain caffeine; for example, espressos, coffee, dark soda, tea, and energy drinks. Moreover, drinking caffeinated drinks is trendy and popular in our society (Rhodes, 2007).

In addition, past research has revealed that the amount of caffeine in energy drinks far exceeds the original amount the Food and Drug Administration (FDA) approved for regular soda drinks (Reissig, Strain, & Griffiths, 2008). For example, the same researchers compared various energy drinks. Their study revealed that one 12 ounce can of soda may contain 71 mg of caffeine compared to 505 mg in a 24 ounce energy drink indicating a person would have to drink more than a 12 pack of caffeinated soda to feel the effect of an energy drink. However, different energy drinks do have different amounts of caffeine. Other popular caffeinated drinks are the trendy coffees with extra shots of espressos, which provide additional caffeine stimulation. One must wonder if young people realize how much caffeine they are consuming. Caffeine is a stimulant for the central nervous system, which makes it a
psychoactive drug, and when it is consumed in greater amounts, it can have different effects on people (Jones & Lejuez, 2005; Taylor & Demming-Adams, 2007). This research will address the self-harm behaviors that the nursing students are reporting and their consumption of caffeinated drinks.

College nursing students are constantly handling stress while simultaneously worrying about schoolwork and their grade point averages. Just like all other college students, nursing students may have jobs, a family, and other courses besides the nursing courses, which make it more stressful. However, unlike other college students, nursing majors have additional stress from their programmed schedule and clinical practicum. In addition, nursing students are constantly worried not to fail, because it might cause them to fail out of the program or repeat a course. Therefore, nursing students often resort to caffeine to keep themselves going. Caffeine is easily accessible and practical before studying or going into the classroom. The caffeinated drinks provide the stimulus and energy for nursing students to keep studying or working.

However, many nursing college students may also develop maladaptive behaviors to alleviate their stress. Favazza (2006) who has researched self-harm behaviors reports that many adolescents who begin self-mutilation continue to do so for several years after about 10 to 20 years. In addition, the same author describes the self-mutilator to be Caucasian, female, and 28 years old. In another article, Hart (2007) describes one typical characteristic of people who engage in self-harm behaviors, which is that they tend to seek out healthcare professions. For this reason, the researcher decided to evaluate nursing students. Therefore, the purpose of this study is to analyze the relationship between the amount of caffeinated drinks consumed and self-harm behavior in nursing students.
Literature Review

Self-mutilation is the act of inflicting repeated injuries to the body by various methods. Some methods of self-mutilation include: banging/hitting self, hair pulling, pinching, cutting, biting, wound picking, severe scratching, rubbing skin against rough surfaces, burning, needle sticking, and carving or swallowing chemicals (Klonsky & Olino, 2008). The term self-mutilation has other terms which have the same meaning; for example, self-injury, self-harm, and self-destructive behaviors. The research reviewed for this study addresses how young people are vulnerable and may inflict bodily harm because self-harming is a way of coping with their internal pain from external variables. Furthermore, Whitlock, Powers, and Eckenrode study (2006) gave a number of sources which demonstrate that self-mutilation behaviors can be comorbid with other mental disorders from the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM IV; American Psychiatric Association, 1994). For example: borderline personality disorder, eating disorders, posttraumatic stress disorder, depression, anxiety disorder, impulse-control disorder, deliberate self-harm syndrome, and history of abuse or trauma were associated with self-harm. In addition, past research has also indicated common characteristics found in self-mutilators; such as, drug use, conflicts with parents or peers, average intelligence, and being employed in a health-care field (Beverly, 2007).

As described, understanding self-mutilation is a complex multidimensional problem. Most literature described the phenomenon yet; limited research has been focused on how caffeine may increase the likelihood for young people to self-mutilate. Spradlin (2007) listed several factors which possibly may trigger self-injurious behaviors, which college students struggle every semester; for example, “too much or too little sleep, poor
nutrition, dehydration, too much caffeine, financial problems, overwork, relationship difficulties, lack of exercise, fatigue, and eating excessive sugar and fat”. Similar to Favazza findings, past research reports that the incidence of self-harm starts during early adolescences; however, the most reported cases are at the age of 18 years old and older (Moyer & Nelson, 2007).

Recent studies have reported that within the last decade self-mutilation incidents within adolescents and young adults have increased (Derouin & Bravender, 2004; Rebecca 2006). Another, study done about the same time indicated that college students’ caffeine consumption and dependence were related to sensation seeking and impulsivity behaviors (Jones & Lejuez, 2005). Perhaps the stimulation of caffeinated drinks (e.g., espresso, energy drinks, soda, and coffee) has increased to consume more of these drinks. Consequently, “coffee is one of the most popular and most widely consumed beverages in the world”, (Taylor, Demming-Adams, 2007).

Some consumers are aware or should be aware that caffeine products increase anxiety, which increase impulsive behaviors (Derouin & Bravender, 2004; Jones & Lejuez, 2005). In one recent study, researchers found that one of their four groups whom engaged in a variety of self-inflicted behaviors experienced a greater level of anxiety (Klonsky & Olino, 2008). Consequently, if caffeine products increase anxiety and self-mutilators experience more anxiety; then that would suggest that the more caffeine a self-mutilator would drink the more self-harm behaviors he/she would inflict. Therefore, health professionals and nursing faulty need to educate college students about how caffeine may possibly trigger incidences of self-mutilation. The goal would be for adolescents and young adults to decrease or stop drinking these drinks and for them to learn more effective coping methods. For this study,
researchers examined the amount of caffeine drinks consumed and compared the number to number of times they reported self-harm.

**Research Question and Hypothesis**

The research question is: What is the relationship between caffeine consumption and self-harm behavior in college nursing students? The hypothesis is that college nursing students who inflict self-harm have a higher rate of caffeine consumption.

**Methods and Procedures**

The study used a descriptive survey design. The researcher obtained permission from the Evaluation and Research Committee in the School of Nursing to solicit nursing students for the study. In addition, Institutional Review Board (IRB) approval was obtained before the study was conducted. With instructor’s permission, the researcher explained the study to the nursing students at the end of class during the summer of 2008. The researcher invited nursing students to complete an individual consent form and survey. Consent forms were disturbed and collected before survey forms were distributed. The Inventory of Statements about Self-injury (ISAS) was the instrument used for the study. Dr. E. David Klonsky of Stony Brook University developed the ISAS. Dr. Klonsky gave the researcher permission to use the ISAS for this study.

The ISAS is a self-reporting tool for “nonsuicidal self-injury (NSSI), [which] refers to the intentional and direct injuring of one’s own body tissue without suicidal intent” Klonsky & Olino, 2008). The ISAS’s internal consistency scored high, with a Cronbach’s alpha of .84. The first section asks about 12 different non-suicidal self-harm behaviors that are done intentionally and without the intent of suicide. The second section has 39 inventory questions about non-suicidal self-harm which rates the questions
on a “3-point scale as very relevant, somewhat relevant, or not relevant”.

Participants were provided with an informational letter of consent that included information about the purpose of the study, instructions, and an explanation of the possible risks and or benefits. The letter stated foreseeable risks and anticipated feelings of discomfort while completing the questionnaire. Consent forms were distributed and collected before the ISAS was distributed. Students were given a second copy of the consent form for their records.

The ISAS had five pages of questions to be answered. In addition, the participants had a page where demographic and caffeine consumption was reported. The ISAS questionnaire had questions about various self-harm behaviors. The ISAS consisted of two sections and one optional page of free expressive writing. Researcher gave instructions to start with the demographic page first then the ISAS questionnaire. After completing the questionnaire the participants were instructed to raise their hands indicating they were finished. Following, the researcher collected the forms. No compensation for participation was given nor stated. Data were reviewed and entered into an Excel document by the researcher and assistant to assure the accuracy of transferring numbers. In addition, research data were all collected by the researcher and stored in locked file storage in the nursing department.

Participants

Fifty-two San José State University nursing students (45 females and 7 males) participated in survey study during the summer, 2008. Data were gathered from two different classrooms, which had a total of 27 students in one classroom and 29 students from the other. Four students did not participate.
Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS, 14.0, SPSS, Inc., Chicago, IL). Of the 52 participants, 12 (23%) reported inflicting self-harm behaviors. Of these 12 students who inflicted self-harm, 9 (75%) were female and 3 (25%) were male. On the intake questionnaire, we compared responses to the question “What type of caffeinated drinks do you drink the most?” between the participants who did and who did not report self-harm. This question listed four types of drinks: soda (caffeine), energy drinks, coffee, espressos, black teas and other.

The participants who reported engaging in self-harm behaviors also reported a slightly higher average number of different types of drinks consumed ($M = 2.42$) than those who did not report engaging in self-harm ($M = 2.13$). The two groups’ responses on the number of settings in which participants often drank caffeinated beverages (e.g., at nursing school or other educational settings, at work, at home, or in other settings) were also compared. The self-harm participants reported drinking at more settings ($M = 2.33$) than the other participants ($M = 1.87$). It could not be determined whether there was a relationship between the amount of caffeinated drinks consumed and the number of self-harm behaviors.

Discussion

In the present pilot survey study, the researcher sought to compare the relationship between the amount of caffeine consumed and self-injury behaviors. However, while carefully analyzing data with the supervision of one of the researcher’s instructors, the data about the amount of caffeine consumed could not be transferred to a level of measurement. Findings had to be compared by percentages and average. A limitation of the main survey instrument was that it yielded overlapping options for the amount of drinks consumed, with some participants reporting consumption
per day and others reporting consumption per week. The problem prevented the researcher from determining the amount consumed. The main goal of the study was to compare the caffeinated drinks to self-harm behaviors, which could not be transferred into SPSS (See Appendix A, question #8).

Of the 12 students who reported self-harm behaviors without suicidal intent eight of them reported self-harm behaviors in 2008. Moreover, one student reported six different types of self-harm behaviors but had no date and was not categorized with the students who currently self-harmed. One student reported eight self-harm behaviors and the occurrences were the day before this study. The self-harm behaviors reported were: biting, pinching, pulling hair, severe scratching, banging or hitting self, interfering w/wound healing, sticking self w/needles, and swallowing dangerous substances. However, this study did not compare between the types of self-injury behaviors nor the occurrences because it was not the intent of the research. The ISAS was used because of the high reliability and validity it has to obtain data on self-harm behaviors.

Health concerns and knowledge of what some students are experiencing in the nursing program should be addressed by the nursing faculty. Knowledge of self-harm behaviors, the past research data on some main characteristics, and perhaps the possibility that caffeine may increase these behaviors may alert faculty to educate nursing students with strategies to relieve stress in a healthy way or seek counseling. Furthermore, even though the data analysis was inconclusive, students and faculty can read about the potential side effects that caffeine may have on young people who have a higher consumption.

Mainly, this study was conducted to gain awareness and to educate young people that caffeine is a potentially harmful stimulant. From this, nursing students may be able to self evaluate:
1) how much caffeine is consumed and 2) what self-harm behaviors are being inflicted. The student may or may not be aware of their maladaptive behavior. In addition, the student may be ashamed or feel stigmatized. As stated previously, past research suggest various factors contributing to self-harm. However, nursing students may be at risk of increasing their maladaptive behaviors when they decide to increase their consumption of caffeine with triple shots of espressos and a couple of energy drinks. In addition, this study provides insight for nursing students to hopefully reflect on any self-harm behaviors and seek out counseling. Students seeking counseling will benefit from exploring what factors may be causing their maladaptive behaviors.

Future research should evaluate if there is a relationship between caffeine and self-harm behaviors. This small-scale study found some self-harm behaviors in nursing students. However, due to error the researcher could not report accurate findings. Nevertheless, caffeine and self-harm behaviors can be compared, and with a greater number of participants the relationship may demonstrate greater findings.
References


**Appendix A**

**Demographic and Caffeine intake Questionnaire**

Please respond to each question by circling the answer that BEST describes you.

<table>
<thead>
<tr>
<th>1. Gender</th>
<th>2. Age</th>
<th>3. Race/Ethnicity</th>
<th>4. Years as a Nurse or Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>&lt;24</td>
<td>African American/Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25-29</td>
<td>American Indian/Alaskan Native</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>Asian Pacific Islander</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35-39</td>
<td>Mexican American/Hispanic/Latino</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-44</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45-49</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50-54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Do you drink caffeine drinks?  Yes  No

(sodas containing caffeine, energy drinks, coffee, expressos, black teas)

(If no, skip to question 9)
<table>
<thead>
<tr>
<th>5. In what setting do you drink caffeinated drinks?</th>
<th>6. What type of caffeinated drinks do you drink the most?</th>
<th>7. How many (8 ounce) caffeinated drinks do you estimate drinking?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing School</td>
<td>Energy drinks</td>
<td>(1-5) Day or Week</td>
</tr>
<tr>
<td>Other Education</td>
<td>Coffee</td>
<td>(5-10) Day or Week</td>
</tr>
<tr>
<td>Work</td>
<td>Expressos</td>
<td>(10-15) Day or Week</td>
</tr>
<tr>
<td>Home</td>
<td>Black tea</td>
<td>(15-20) Day or Week</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
<td>(20-25) Day or Week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25 &lt; ) Day or Week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>Associate Degree</td>
</tr>
<tr>
<td>Part-time</td>
<td>Bachelor's Degree (for nursing)</td>
</tr>
<tr>
<td></td>
<td>Bachelor's Degree (other field)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>
Mississippi’s Defiance of Brown and the Internalized Racism It Created

ABSTRACT
This paper examines the history of Blacks in Mississippi and the fierce determination to receive an education equivalent to whites. Despite progress towards racial equality and social improvements, over the many years and decades, education for Blacks in Mississippi remains in a dismal state. The historical significance and the legacy of Brown v. Board of Education are also explored in
this essay. For Black Mississippians the legacy of Brown is not one of true and complete integration. Schools in Mississippi continue to operate in a dual system, whereas public schools are for Blacks and private academies are for whites. Finally, this essay concludes with the spiral downfall that I have labeled as internalized racism in Mississippi Black communities. Black Mississippians now do not regard education as a top priority and it is because of the major inequities and white’s defiance of Brown to keep education separate and not equal.

Introduction

Mississippi’s defiance of the 1954 Supreme Court’s ruling in Brown v. Board of Education, which eliminated segregation in U.S. public schools, set the stage for problems that persist in the black community. For over fifteen years, the State of Mississippi defied Brown’s I and II, the Civil Rights Act and the Court’s 1969 ruling in Alexander v. Holmes County [Mississippi] Board of Education. The latter court case declared that school desegregation be achieved “at once and operate now and hereafter only unitary schools.” Mississippi’s defiance of the two Brown rulings and other rulings were harmful for Mississippi’s black school children. Mississippian defiance against segregation has in effect developed a sense of internalized racism in the black community in Mississippi over the generations. After Brown, the civil rights movement begun. Volunteers in the movement worked side by side with black Mississippians who risked their lives for racial equality. In mass protest decades of oppression, disenfranchisement, and segregation was confronted and to a large extant dismantled. The progress that was made during the civil rights movement gave blacks the right to vote, the power to become economically self sufficient, a sense of racial pride, and most importantly, the end of school segregation. Blacks now serve as superintendents in
Mississippi public schools; they are the educators and leaders in the black community. However, the gap in academic achievement between the races continuously widens. Despite their positions the public schools are in an array of disrepair and the cause is no longer segregation when the black leaders and teachers do not confront the issues. Instead, black leaders and parents have internalized white Mississippi’s rhetoric that blacks are underachievers, or that too much education would mean they, the educated, would eventually leave the community. This belief was expressed by whites in the earlier 1900s and it is now held by blacks.

Mississippi’s Defiance before Brown

Long before Brown, Mississippians held strong opinions against the education of blacks. After the Civil War and during Reconstruction, 1863-1877, blacks knew that if they were to assert their rights as free people, education was a priority. However, their “passion for education in the 1860s was equaled by the whites’ desire to deny or limit the education they received.”¹ White Mississippians feared that equal education for blacks would destroy white supremacy. But times were changing with the help of the Freedmen’s Bureau and Northern Philanthropic Reformers. Northern philanthropists, such as Robert C. Ogden, George Peabody, and John F. Slater had an investment in keeping blacks in the South as laborers because of their investment in cotton. They concentrated their time, energy, and money in building and operating industrial training schools for blacks. Southerners were apprehensive about what these northern philanthropists were trying to do with their former slaves. The philanthropists assured

Southerners that their goals for the industrial training schools were to keep blacks attached to southern soil as wage laborers, sharecroppers, and domestic workers, or, better yet, industrial training was meant to keep blacks in “their environment and not out of it.” ² Another assurance that all philanthropists asserted for the purpose of industrial training was that their “policies and programs were designed primarily to develop an economically efficient and politically stable Southern agricultural economy by training efficient and contented black laborers while leaving the Southern racial hierarchy intact.”³ The idea of the philanthropists’ industrial training programs fit a pattern that Southerners could accept: that it would keep blacks submissive.

Despite the philanthropists’ goals and their industrial training schools, Southerners had to contend with schools for ex-slaves run by missionary societies and black religious organizations. Unlike the philanthropists, black schools organized and run by black missionaries provided a more traditional academic education. Southern states and especially Mississippi opposed such education for blacks. Although Mississippians fought vehemently against religious organizations teaching blacks, they recognized that they needed to keep blacks in Mississippi as cheap laborer and they could not ignore the financial benefits that such organizations brought to the state. Instead, white Mississippians set limitations as to the grade level for blacks and they censored the content in textbooks that blacks were taught from. For example, between the 1920s and the 1940s, blacks were only allowed to attend school four or five months out of the year. They were not permitted to

³ Anderson, 392.
advance past the fifth or sixth grade. The textbooks used in the black schools were censored by white officials who deleted any references to voting, elections, and democracy.\textsuperscript{4} Well into the twentieth century, white Mississippians maintained control over the curriculum and the budget for the education of blacks. Whites controlled government funding for the black schools, and “[w]ith white and black schools competing for available funds, black schools were certain to be the principle victims.”\textsuperscript{5} In 1918, when black parents went to the Mississippi state legislature to inquire about the lack of funds for black schools that were used for “the glory of your children and leave ours in ignorance, squalor and shame” their concerns were ignored.\textsuperscript{6} In 1941, the Mississippi Association of Teachers in Colored Schools (MATCS) complained to white political leaders about the short school term for black, the unequal salaries they received compared to their white counterparts. They voiced concerned about the inadequacy of the buildings in which they taught, the lack of school material and the limitation for higher education. Again, all inquiries were ignored.\textsuperscript{7}

The way in which blacks perceived northern philanthropists and their industrial training schools is apparent in the works of Booker T. Washington and W.E.B. Du Bois. Washington and Du Bois were contemporaries; however, they disagreed on blacks and education. Washington had graduated from Hampton Normal and Agricultural Institute in 1874. By the age of twenty-five he had been hired to oversee the construction and development of

\textsuperscript{4} Berry, 272.
\textsuperscript{6} Litwack, 106.
Tuskegee Normal and Industrial Institute, a black teachers’ college, which was modeled upon Hampton. Du Bois received his bachelor’s degree from Fisk University in 1888 and in 1895 became the first black to earn a Ph.D. from Harvard. In 1909 Du Bois was one of the founders of the National Association for the Advancement of Colored People (NAACP), organized to eliminate discrimination. Washington did not believe in confronting whites with demands for equal rights for blacks. Du Bois believed that confrontation was the only way for blacks to gain respect from whites and to secure equality in education. In 1895 Washington delivered his most famous speech, the “Atlantic Compromise,” to a group of leading white businessmen. Washington began by saying that “[o]ne-third of the population of the South is of the Negro race. […] Ignorant and inexperienced, it is not strange that in the first years of our new life we began at the top instead of at the bottom.” Washington was referring to the number of black men who had been elected to Congress and the state legislatures during Reconstruction. He asked how blacks could run state affairs if they did not know how to till the land? Washington believed that “[n]o race [could] prosper till it learns that there is as much dignity in tilling a field as in writing a poem. It is at the bottom of life we must begin, and not at the top. […] The wisest among my race understand that the agitation of questions of social equality is the extremist folly, and that progress in the enjoyment of all the privileges that will come to us must be the result of severe and constant struggle rather than of artificial forcing.” Washington’s speech insists, that blacks must have patience, industry, and thrift to gain respect from whites. Washington’s speech reinforces what

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9 Washington, 144.
whites believe: that blacks are like children and they must be dealt as such.

In response, Du Bois wrote that no doubt Washington’s speech “startled the nation to hear a Negro advocating such a programme after many decades of bitter complaint; it startled and won the admiration of the North; and after a confused murmur of protest, it silenced if it did not convert the Negroes themselves.”

Du Bois points out the danger in Washington’s acceptance of “the alleged inferiority of the Negro races” and his advocacy of “a policy of submission.”

Washington’s ideas initially overshadowed those of Du Bois. According to Du Bois, Washington had “silenced” and “converted” blacks to believe in “thrift, patience, and industrial training,” as opposed to their opposites: the right to vote, civic equality, and education in the liberal arts. What Washington argues and asserts as a black activist, sets the tone that many black Mississippians took to heart. That perseverance, examples of working hard as black laborers first and appeasing Mississippi whites had thoroughly put them in a position of total subordination. By the time of the Brown ruling, for most blacks the inequality in education was how things were for them in the most southern place on earth.

The Significance of Brown v. Board of Education

Brown is held as the most significant, the most potent, and the most progressive Supreme Court ruling in history. Brown involved hundreds of court school desegregation cases, however,

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11 Levering, 323.
and over the years *Brown* was narrowed to five: Delaware, South Carolina, Virginia, Washington, DC, and Kansas. The Supreme Court combined the five cases because each sought the same legal remedy. In each case black students were being bused outside of their district to attend a school that was not adequately built and under funded. School textbooks were outdated or had pages missing. And there were always fewer teachers than grades. There were three components of arguments that the lawyers in *Brown* needed to address. They were the Fourteenth Amendment (Equal Protection under the law), *Plessy v. Ferguson* (“separate but equal”), and the plaintiffs in the case of *Brown v. Board of Education*.

The Court’s ruling in *Brown* brought into debate the adoption of the Fourteenth Amendment in 1868, which although its framers made no mentioning of race, the assumption is that it did not apply to blacks. The Fourteenth Amendment, in part, states that “No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States […] nor deny to any person within its jurisdiction the equal protection of the laws.”

13 United States Constitution.

development and its present place in American life throughout the Nation.”

The second issue that needed attention was the infamous 1896 “separate but equal” ruling in *Plessy v. Ferguson*. Again, the Court recognized that the *Plessy* case was not about equality in education, but separate facilities for blacks and whites. As long as *Plessy* stood there would be no equality in education. For over fifty years, while “separate” was the law and well maintained, the “equal” never fit the equation. The *Brown* ruling overturned *Plessy*. The Court now turned to the matter at hand: Does segregation deprive black school children of an equal education?

The lawyers for the plaintiffs in *Brown* cited the “doll test” designed by Kenneth and Mamie Clark. The Clarks placed a white doll and a black doll in front of black children between the ages of three to seven. The children were then asked a series of questions about which doll was good or bad, and which doll they identified with. In most instances the black children chose the white doll as being the good doll and the one they most wanted to be like. Upon hearing of the results from the Clark’s test, the Court concluded that “[T]o separate them from others of similar age and qualifications solely because of their race generates a feeling of inferiority as to their status in the community that they may affect their hearts and minds in a way unlikely ever to be undone.” The Clark’s test illustrated how early internalized racism begins in black children. The continence of segregation in Mississippi and the continued defiance against the *Brown* ruling carried that legacy from the Clark’s test through many generations.

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16 *Brown*, 1954.
Mississippi’s Reaction and Response to Brown and Their Defiance

After the Brown ruling, some southern states eventually made some concessions to the ruling. For example, if a handful of black students enrolled in what had been an all-white school, the school was considered desegregated. For other states the process of desegregation took longer. However, Mississippi defied the Court’s ruling for fifteen years. In 1970 Mississippi could still brag that it was the only state that had not desegregated any of its public schools.

The Court’s ruling in Brown did not specify how the desegregation of public schools should proceed. Instead, the Court sent the cases back to the District Courts; the lower courts were to implement desegregation plans. However, one year to the day later, the districts had not complied with the Brown ruling. On May 31, 1955, the Supreme Court issued Brown II. In Brown II the Court stated: [T]hat the defendants make a prompt and reasonable start toward full compliance with our May 17, 1954, ruling,” with the added inclusion of the famous words “with all deliberate speed.”17 It was at this point that many southern states gradually but grudgingly started desegregation.

Upon hearing of the Court’s decision in Brown II, Mississippi’s senior senator, James O. Eastland, announced

Southern people will not be violating the Constitution or the law when they defy this monstrous decision. They will be defying those who would destroy our system of government. You are not required to obey any Court which passes out such a ruling. In fact, you are obligated to defy it.

The law is what the people make it, and a ruling is no more than [what] public sentiment makes it.\textsuperscript{18}

Eastland owned one of the largest plantations in Sunflower County, Mississippi and its most powerful politician, a true-blue demagogue, who led Mississippians to believe his word not the Supreme Court was the law.

Others followed Eastland lead in voicing their opinions against Brown. Mississippi State Supreme Court Justice, Tom Brady asserted, “We as Mississippians will not bow down to a court of nine old men whose hearts as black as their robes.”\textsuperscript{19} A less prominent figure but a widely read columnist wrote: “You and I know that we are not going to permit Negroes to enter our white schools in Mississippi, and any wishing to the contrary is like a man in hell wanting a drink of ice water.”\textsuperscript{20} Some of the strongest opponents of Brown were planters or large farm owners, such as Eastland. Cotton was still king in Mississippi and required eight months of fulltime operation. Blacks who lived on the farms were sharecroppers and were often in debt to the plantation owner, so they were in involuntary servitude. Many sharecroppers could not afford to send their children to school. White Mississippians also argued that “God ordained segregation as a means to co-exist

peacefully with one another.”

Aside from involuntary servitude or what God ordained, Mississippians argued against segregation because they believed it would lead to intermarriage or the “mongrelization” of the races.

With all the negative talk, opinions and reasons to defy the Court’s ruling, Mississippi’s best weapon of defiance came through when they elected James Plemon Coleman for governor in 1956. Coleman did not give long speeches on how he was going to fight the Brown ruling, he summed it up best when he said, “Integration is no more possible here than it is for the Mississippi to run uphill.”

Neither did Coleman believe it was necessary to protest integration, instead Coleman devised a plan that would “whip ‘em legal like” peacefully and quietly was his motto. Coleman planned to enact a number of state laws, which he knew would not pass federal law. “Any legislature can pass an act faster than the Supreme Court can erase it,” he said. The laws Coleman had in mind were a continuation of the Jim Crow Laws that many southern states adopted after slaves were emancipated. From 1865 to 1956, Mississippi enacted twenty-two Jim Crow statues. For example, Mississippi passed three segregation laws after the Brown decision. In 1956, one such state law stipulated “Separate schools to be maintained. All state executive officers required to prevent implementation of school segregation decision by ‘lawful means.’ Governor may close any school if he determines closure to be best

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22 Sherrill, 176.
23 Sherrill, 177.
in interest of majority of children.”\textsuperscript{24} After the 1930s, the framers of these laws excluded any mention of race; however, the intention of the laws was clear. Needless to say this law did not pass federal jurisdiction. Regardless of how absurd or insulting Jim Crow Laws were, black Mississippians had to abide by them—it was a matter of life or death.

By 1964 with the passing of the Civil Rights Bill, Title VI and the 1969 Supreme Court decision in \textit{Alexander v. Holmes [Mississippi] County Board of Education}, Mississippi was finally defeated. Title VI allowed the government to withhold federal funds from any school district that had not desegregated. Some Mississippi counties complied with the bill, while others did not. During the 1968-69 school year, “thirty-seven recalcitrant school districts in Mississippi had lost more than $9 million in federal funds under Title VI.”\textsuperscript{25} Mississippi’s defiance against school desegregation came to an end in the \textit{Alexander} decision. The Court recognized that a large delay in the desegregation of public school was due in part to the Court’s earlier use of the phrase “all deliberate speed,” which “has turned out to be only a soft euphemism for delay.”\textsuperscript{26} The Court recognized that until this “soft euphemism” was eliminated, southern schools will continue the practice of dualism. As with \textit{Plessy}’s “separate but equal” clause, the Court found that there were “no longer any justifiable issues in the question of making effective not only promptly but at once—now.”\textsuperscript{27} In 1969, Governor John Williams announced:

\begin{quote}
\textsuperscript{24} Jim Crow Laws: Mississippi, http://www.jimcrowhistory.org/scripts/jimcrow/insidesouth.cgi?state=mississippi
\textsuperscript{1}
\textsuperscript{25} Crespino, 181.
\textsuperscript{27} \textit{Alexander}
The Moment that we have resisted for fifteen years—that we have fought hopefully to avoid, or at least delay—is finally at hand. I am frank to tell you that our arsenal of legal and legislative weapons has been exhausted. Make the best of a bad situation with God’s help.28

White Mississippian had prepared well in advance for this breaking news. They had “established plans to rent hotels, churches, and other buildings to serve as temporary private schools.”29 The new schools that were established were called “Private Academies.” Within a span of two years Mississippi had up and running 158 private academies that were receiving state tuition vouchers.30 They were established in every town and region across the Delta. As white teachers and students left the public school system they took public school supplies with them. A white teacher who remained with the public school system commented that after returning to school from Christmas break, the lab equipment and other supplies were either missing or destroyed. Another teacher who gladly left the public sector to teach at an academy bragged that before she transferred to the academy, she took with her library books, desks, and other public supplies. She concluded that the only difference was in the location. In this way it is as if white Mississippians decided to change the euphemism of

“all deliberate speed” to desegregate public schools *hurriedly, deliberately, and speedily* into public academies. When black children walked through the supposedly integrated school doors, a new battle for the equality in education had begun.

**A Losing Victory**

On December 9, 1952, the Supreme Court heard arguments for and against segregation in the *Brown* case. One year later the case was re-argued. One year and half years later the Court had reached its decision. The year 2004 marked the fiftieth anniversary of *Brown*. There were many discussions and written commentaries about the ineffectiveness of the *Brown* decision in regards to the black community. While all of them would agree that *Brown* was a significant and important case, however, judging from the conditions of public education in minority neighborhoods, *Brown* had failed. Today schools are more segregated than they were in 1954 or have been resegregated.\(^{31}\) This is even more so in Mississippi. Mississippi has been the worst, the last, the most ineffective implementer of the *Brown* order, and the most defiant.

How did Mississippi’s defiance over the many years create internalized racism in the black community? Perhaps this is best explained and exemplified in Anne Moody’s 1968 autobiography *Coming of Age in Mississippi*, and Chris Asch’s 2008 historical research in *The Senator and the Sharecropper: the Freedom Struggle of James O. Eastland and Fannie Lou Hamer*. Moody’s autobiography covers *Brown* and the Civil Rights Movement. A time that uplifted and empowered the black community. Signs designating *whites only* and *colored only* were removed during the intense struggles for blacks civil rights. It was an accomplishment

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that much of the overt and the explicit racism that had been a part of white dominance over blacks had been removed. Forty years later, Asch writes that for the most part blacks and whites “interacted on an egalitarian basis,” but all show of courtesy and progress stops there. There is no interaction about schools. There is “segregation academies” for whites only and the public schools are for blacks only. There is no in between.

Civil Rights activist Anne Moody was born on the Carter plantation in Centreville, Mississippi in the 1940s. By the time she was six there was still only one black public school. She wrote, “I was going to Willis High, the only Negro school in Centreville. It was named for Mr. C.H. Willis, its principal and founder, and it had only been expanded into a high school the year before I started there.” Five years after Brown Moody was a senior in a new public school built for blacks. The seniors, she writes were “one of the new ‘separate but equal’ schools built throughout the South as a result of the 1954 Supreme Court decision.”

The school was built to consolidate all of the “Negro” schools in Wilkinson County, Mississippi. Built on a fifty-two acre plot, it was to accommodate “three thousand students and eighty to ninety teachers.” Moody does not mention any blacks protesting or demanding integration. Instead, “students, teachers, and principals alike, were bragging about how good the white folks were to give us such a big beautiful school.” She continues, “Our shiny new school would never be equal to any schools of theirs. All we had was a shiny new empty building, where they always had the best teachers, more state money, and better equipment.” What is more important is that what Moody is saying here is that nothing

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32 Anne Moody, Coming of Age in Mississippi (New York: Dell, 1968), 229.
33 Moody, ...
34 Moody, 229.
had changed since the *Brown* ruling or since Washington’s 1895 “Atlantic Compromise” speech were “agitation of questions of social equality is the extremist folly,” he said.  Blacks have grown with fear of white reprisal for so long, that rather than to face the facts, knowing that the new school is not the Supreme Court’s order, they would rather accept white tokenism than to confront white racism.

Moody graduated from Tougaloo Southern Christian College in 1963. She remained in Mississippi to work with the NAACP and other black political associations fighting for the rights of blacks to vote and receive a higher education. By the time Moody was twenty-three and a field organizer and worker with the Congress of Racial Equality (CORE), she was assigned to work in Madison County, Mississippi. Moody believed Madison County would be a good county to work in towards voter registration because blacks outnumbered whites three to one and “Negroes owned over 40 percent of the land in the county.” Nevertheless, whites still controlled most of what went on in Madison. For example, Moody writes: “In Madison County, the use of teen-aged labor during the cotton-picking season was an institution. The Negro schools actually closed at noon the first two months of the school year, so the students would be available to work for the white farmers.” Although blacks owned 40 percent of the land in Madison, they did not profit as growers in the cotton industry. This is because the federal government gave out allotments on how much cotton each state could pick. The state dictates allotments for each county. And “Negroes aren’t able to get more, regardless of how much

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35 Washington, 146.
36 Moody, 312.
37 Moody, 354.
land they owned.\textsuperscript{38} The income young blacks made from picking
the white farmers cotton supplemented their parents’ farming
income. This is another example of involuntary servitude.

In Madison, Moody would receive letters from her mother
begging her to leave Mississippi, because she feared for her life.
Moody’s mother stated that the sheriff in Wilkinson County was
fully aware of her activity in Madison and he advised her to tell her
daughter to never come back. Moody did try to visit her
grandmother in New Orleans, only to be told to get away from her
door. Blacks who joined the protest movement were often outcasts
in both the black and white communities. Participation from black
residents in Madison was often an on again off again experience.
Moody often received cold stares from adults while canvassing to
encourage those eligible to vote to register. Although no one said
anything verbally, she interpreted their stares as if they were
saying, “Get out of here. You’ll get us killed.”\textsuperscript{39} Their fears came
from the senseless acts of violence against organizers in the
movement.

Moody was one of thousands who gathered for the 1963 March
on Washington. While listening to the many guest speakers, she
came to the conclusion “we had “dreamers” instead of leaders
leading us. Just about every one of them stood up there dreaming,”
she said.\textsuperscript{40} By the end of her autobiography she expresses doubt
that anything will ever change in Mississippi. She says, “I
WONDER. I really WONDER.”\textsuperscript{41}

Moody had cause to wonder. No doubt the passage of a number
of civil rights legislations opened a whole new social and political

\textsuperscript{38} Moody, 313.
\textsuperscript{39} Moody, 349.
\textsuperscript{40} Moody, 335.
\textsuperscript{41} Moody, 424.
freedom for black Mississippians. Blacks could and would register to vote without being intimidated by white locals. Federal funding helped to establish a number of legal services to help the poor for job training, subsidized housing, and child care services. However, whites controlled all federal funding programs. And, while their children attended private academies, they “did not abandon their positions of authority within the school system.”

In 1994, by the time Chris Asch came to live and teach in Sunflower, Mississippi, the civil rights movement was a thing of the past. Black students had no knowledge of the movement’s accomplishments; it was a past that their elders never talked about. Asch came to love Sunflower and its people; however, within a short space of time, he came to recognize “that it is a deeply troubled place.” He also soon realized that his black pupils had so little contact with white people that “they wanted to touch [his] hair and skin to see what it felt like.” Asch’s students’ wanting to touch his “hair” and “skin” reflects back to the Clark’s doll test done in 1954. Black children then, as well as now, after years of segregation still hold a positive affinity to being white.

Asch taught elementary to high school students for more than ten years. He said that this was a daunting experience. Even in 2004, “[t]he same way that private academies allowed white families to remain ensnared in a segregated worldview long after the end of racial segregation, the plantation mentality remained firmly implanted in many black people long after the old plantation system had crumbled.” What Asch is describing is the internalized racism that decades of disempowerment, subordination

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42 Asch, 246.
43 Asch, 283.
44 Asch, 294.
45 Asch, 226.
and white control had embedded into black culture. The new plantation system was through the access of federally funded programs. Asch believes that after gaining the right to vote and after the federal resources started pouring in, many blacks felt they had made progress and that that was enough. Working closely with high school students and helping them to prepare for college, Asch found out that a number of black parents and community leaders pay lip service to the idea of a higher education for their children, fearing that if their children receive too much education they will only leave. Asch states that he “dealt with high school counselors who did not send transcripts, recommendations, and other required material to college admissions offices because they did not want the students to leave the state for college.” The counselors had the parents’ approval. This belief reflects the “plantation mentality” Asch speaks of. Slave-owners feared that if blacks learned to read and write it would lead to rebellion or their escape. White farmers, after emancipation, felt the same; however, they also felt that literacy had no place in the plantation economy. And now black parents have internalized the fear that education will give their children the incentive to leave, which has had a detrimental and negative impact on black children today.

The Supreme Court’s 1954 decision in Brown, eliminating segregation in public schools, threatened white Mississippians social structure. However, white Mississippians defied the Court’s ruling for fifteen years by outwardly ignoring the decision, as well as instilling fear into the black community. They also used and exhausted every legal angle they could to not comply with Brown. And when the legal battle was exhausted, they built “segregated academies.” As a result a vicious cycle emerged. Those public schools that whites existed and that blacks “intergregated” are now

46 Asch, 296.
under funded, unequal in facilities compared to white academies, and as a public institution they do not meet the educational standards or requirements as they should. There is little encouragement or involvement through community or parental support. Old habits and years of white supremacy have proven to be hard to break from, especially when the habits have been internalized.

A very special Thank You to Dr. Mitchell and Erma Jackson.

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Biography
Edrina Rashidi is a Senior majoring in Humanities with an emphasis in European Studies. She emigrated from Iran to the USA with her family at a young age and has also lived in Spain. Her passion for Peruvian History was sparked during a study abroad with San Jose State University in Peru. She conducted part of the research for this essay at the University of Illinois at Urbana-Champaign with the Summer Research Opportunity Program. Edrina plans to continue research on the ways in which Moorish aesthetic influences in Colonial Peru shaped the lives of women. She will be attending the Ph.D program at the University of Illinois Urbana Champaign in the Fall.

Edrina Rashidi
Major
Humanities: European Studies;
Minor: Spanish
Mentors
Dr. Cynthia Rostankowski
San Jose State University
Dr. Jovita Baber
University of Illinois at Urbana-Champaign

Las Tapadas Limeñas: Islamic-rooted Influences on the Covered Traditions of Colonial Lima
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ABSTRACT

This research examines the Islamic traditions which reached Peru and transformed Lima’s architectural and fashion preferences during the colonial period. This will be done by investigating how the attire of the tapadas, or the upper-class women who veiled themselves in sixteenth through nineteenth century Lima, was an adaptation of the Islamic hejaab. Close readings and analysis of anecdotal histories by Ricardo Palma, in addition to travel logs by George Squier, Flora Tristán and a number of other Europeans who came to the Andes during the seventeenth through nineteenth centuries will explore the shifting roles of women and interpretations of their apparel. Through a comparison of reactions to Islamic-rooted traditions in Lima to those in Iberia and the Middle East on the Islamic hejaab, the implications of veiling are analyzed to show, first, that Islamic traditions did travel to Lima through colonialism, and second, to show how these customs changed as they reached Peru. In addition, a bridge between veiled women and artistically covered baroque balconies with mudéjar, that is, Iberian Gothic-Muslim, origins will be used as a lens to analyze how women in Lima viewed and participated in city life, actively and passively, through a covered surveillance in addition to the opinions of this power and freedom.
Introduction
The practice of women’s veiling is a familiar tradition among persons from the Middle East who associate with Islam.47 However, through migration into Iberia by Islamic cultures and colonization in Latin America by Spanish conquistadors, the custom of the hejaab, covering the Islamic woman’s head and face, traveled to Peru, but lost its original religious implications, transforming the meaning of veiling from an Islamic practice to a secular fashion. Through its covered form, this fashion preference allowed women in Peru to become more involved with city life, a privilege often denied to the upper class Creole women in order to preserve their family honor. The tapadas limeñas, or the covered upper-class women of Lima, wore a veil covering all but one eye, called a manto and a skirt called a saya which allowed them to walk in the city streets, communicating with women and men of all classes, but never revealing their identity. Similarly, baroque wooden balconies with celocía windows carved in the mudéjar style allowed women to take down their veils and stand above the city streets overlooking urban activities nearly undetected.

However, since the New World was to be a Christian land, free of everything reminiscent of the Islamic occupation in Iberia, these style preferences were met with great opposition by Spanish kings from Philip II to Charles III, who fined and outlawed the use of the veil in both the Iberian and Andean world. This was joined by the efforts of the Peruvian viceroys and ecclesiastics who viewed the tapada as a danger to colonial society.48 Moreover, previous scholarship, such as that of María José Rodilla and

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47 This research was funded, in part, by the Summer Research Opportunity Program at the University of Illinois at Urbana-Champaign.
48 Martín, Daughters of the Conquistadores, 302.
Thomas Ballantine Irving shows ambiguity toward the customs of veiling and mudéjar architecture in Lima. When compared, these scholars point out that the clothing and architecture of Lima either originated from the Christian conquistadors who had adopted the Islamic customs that hybridized with Spanish culture, or that it was indeed crypto-Muslims, who traveled and brought their aesthetic traditions to Peru while leaving their religious identity behind. The tapadas limeñas, or the covered women of Lima, were a Peruvian phenomenon that changed the role of women in urban life, challenged Iberian laws, and transformed the meaning of the veil from an Islamic tradition to a method of independence among the Catholic women of Lima.

This research was conducted to answer the central question, “How did Islamic-rooted aesthetic traditions, as shown by the tapadas and celocias, reach Peru, and change?” More specifically, it will respond to this question by examining why Limeñas started wearing the manto and what this attire said about the upper-class women of Lima. Next will be a discussion of the aesthetic and cultural artifacts and practices and how these were responded to by citizens of and travelers in Peru. I will also examine how the tapada challenged social norms and gender roles by covering herself, and how this also manifested in part to the styles of covered balconies, where one could not detect from the street if one was being watched. This will be followed by examining who the constructors of the Limenean baroque balconies were and why these structures were built in the mudéjar style. Most importantly, I will examine the role of women in seventeenth through nineteenth century Peru and the liberties they did and did not enjoy. This will be followed by a comparison of the manto’s use as a veil in Iberia and how it compared to its uses in Lima. Lastly, I will compare cultural implications of the fashion of the tapadas
in Lima to those of veiling in Islam to examine how the Peruvian *manto* and *saya* compared to the Islamic *hejaab*.

**Translating the Meaning of the Tapadas in Past Literature**

Islamic cultural and architectural influences on the Iberian Peninsula have been heavily investigated; however, there is a need for greater research on Islamic-rooted traditions brought to the Andean world through Spanish Colonialism. Current research on the role of women in Latin America is rich, yet there are few who have pursued the topic of the *tapadas limeñas* in recent scholarship. Previous literature, such as the articles, “A One-eyed Gaze: Gender in 19th Century Illustrations of Peru,” by Deborah Poole and “La Patria Como Mujer: el Cuerpo Feminino y el Imaginario Nacional en la Visión de Melchor María Mercado,” by Seemin Qayum, observe the artistic representations of *tapadas* in Peru and Bolivia, conveying that the fashion of the *tapadas* was practiced by upper-class women wearing a *saya* and *manto* to both hide themselves and highlight the shape of their figures. Further, this source shows that though Lima was the cultural center for the *tapadas*, their fashion extended to other cities as well, but with some differences.

The *tapada* has been seen as an exotic figure that employed shadows of orientalism in her clothing. She represented a fascination with the Islamic colonizers of Iberia in a country that was attempting to gain its independence from Spain, a manifestation of the pursuit of greater rights for women who had become interested and involved in city life and even a Christian religious symbol by some colonial travelers in the Andes.

Before studying Islamic-rooted influences in Peru, however, one must first consider the situation of persons of Islamic backgrounds in Spain during the same time period. The article, “The Expulsion of the *Moriscos*, 1609-1614,” by Stephen Clissold,
describes the ongoing Inquisition after the Reconquest of Granada in 1492. Muslims were given the option of leaving or converting. Many of the mudejares, or Moors who were allowed to stay forged their conversion to Christianity in order to remain in what they considered their mother-country, nevertheless continuing to practice their faith in secret. Thus, as converted Christians of Islamic origins, they were called moriscos. In 1502, all Muslims who refused to be baptized were ordered to leave; those who stayed were forcibly baptized and no longer permitted to exercise Islamic customs such as the use of veils by the now morisco women. Additionally, an interesting phenomenon Clissold writes about was the attempt to forbid Moriscos from wearing clothing typical of Arabs, as well as prohibiting Muslim customs and the speaking of Arabic. The final expulsion of Moriscos did not occur until the early seventeenth century with King Philip III and only a minimal number of persons truly believed to have converted were allowed to stay in Spain.49 This shows the importance of studying the number of persons from Islamic heritage remained in the Iberian Peninsula after the Reconquest and how many of these persons immigrated to the Andes after the Reconquest. In the article, “Spanish Women and the Indies: Transatlantic Migration in the Early Modern Period,” Ida Altman stated more than half of the women who migrated from Spain to Latin America came from Al-Andalus, the southern region of Spain which was occupied by the Moors from 711 - 1492, noting that the majority of Spanish women migrating to the New World came from an area rich with Islamic influence.

Perhaps the leading source on the tapadas of nineteenth-century Lima is Deborah Poole, who discusses the role of the clothing style of the tapadas limeñas by analyzing a series of

49 Clissold, The Expulsion of the Moriscos, 819.
paintings by Leonce Angrand and Johann Moritz Rugendas, two European travelers in Lima during the nineteenth century. In this text, Poole observes the three categories of women: the upper-class tapada, the mulatto woman with one Caucasian and one African parent, and the Indian, or indigenous woman, comparing the two latter classes with the former. Poole refers to the tapada’s “disturbing resemblance to European fantasies of Arab women,” agreeing with the hypothesized origin of the fashion and its direct or indirect attribution to the Islamic women in Spain. Yet, Poole also argues that the tapada was a flirtatiously dressed woman, who though completely covered, wore attire which accentuated her figure, especially with her buttocks-enhancing skirt called a saya and corseted top characteristic of French fashions existing throughout Latin America at the time. This ironic combination of a symbol of chastity with garments that create a provocative silhouette emphasized the sheer mystery of the woman behind the veil.

In contrast, Peruvian scholar, Francesca Denegri argues that while the tapada suggested flirtatiousness with the exposure of her small ankles, being veiled was also a sacred practice to the wearer. Any man who attempted to unveil these women faced severe chastisement. Denegri states that the tapada is a phenomenon of Colonial Peru from the seventeenth through nineteenth century. The tapadas were threatening to the opposite sex since the limeñas were receiving privileges similar to those of European men, which was unheard of during this time. As also discussed by Poole, Denegri reminds the reader that many laws attempted to prohibit the tapadas from wearing their veils because their secret identity was argued to be an offence to God: fathers and brothers could be

50 Poole, One-Eyed Gaze, 339.
51 Denegri, Abanico y la Cigarrera, 60.
attracted to their daughters and sisters without knowing who it was they lusted for.\textsuperscript{52}

María José Rodilla discussed two alternative perspectives of the \textit{tapadas limeñas} in \textit{Escrito en los Virreinatos}. Her chapter on \textit{Tapadas y Busconas} first discussed the independence of the \textit{tapadas} in the earlier periods of Colonial Lima. However, the insistent laws of Spanish kings, such as Philip III, Philip IV, Charles II and Charles III made the \textit{manto} a thing of oppression rather than liberty; this was shown by Philip IV’s mandate for women who wore the \textit{manto} and \textit{saya} in this manner to pay a large fine for the act and that the \textit{manto} should be confiscated. Women decided to pay the cost and continue in their concealed attire. The veil was finally outlawed in the late nineteenth century. Many responded to this act as the stripping of the mysterious beauty of the \textit{tapada}, showing the women for their age and their flaws, revealing the misogynist attitudes rooted in the mandates of the men who prohibited the use of the \textit{manto} as a veil.\textsuperscript{53} Toribio de Mogrovejo, Spanish archbishop in Lima, argued that the \textit{tapada} was a woman of too much independence and caused men to sin. He went further to say the \textit{tapada} could easily walk in the streets with her lover, or even be a prostitute,\textsuperscript{54} showing a sense of misogyny which existed among the Spanish ecclesiastics in Lima. In contrast, Carrió believed the \textit{tapada} to be a virtuous and honorable woman. Rather than believing that the \textit{tapadas’} garments came from the influence of the Arabs, he asserted that with her attire, the limeña attempted to imitate the angels.\textsuperscript{55}

\textsuperscript{52} Ibid., 60-61
\textsuperscript{53} Rodilla, \textit{Escrito en los Virreinatos}, 84-85.
\textsuperscript{54} Ibid., 85.
\textsuperscript{55} Carrió de la Vandera, \textit{El Lazarillo de Ciegos Caminantes}, 402.
Although there is some ambiguity in previously mentioned scholarship about the origins of the tapada, it is agreed that the fashion lasted for three centuries in Peru. According to the anecdotal histories of Ricardo Palma and travel logs Flora Tristán, the tapada style came to Peru in 1560 and was exclusive to Lima. As referenced by Angelica Isabel Brañez Medina in *El vestido femenino limeño de elite durante la era del guano*, Palma argued that the fashion was introduced to Lima by doña Teresa de Castro, the wife of the viceroy don García Hurtado de Mendoza, the marques of Cañete.56 Mariselle Meléndez in “*Patria, Criollos and Blacks: Imagining the Nation in the Mercurio Peruano, 1791-1795*,” explains that the fashion was not exclusive to Lima; it started in the late fifteenth and early sixteenth-century Spain when covering of the face was outlawed by Spanish government in Granada following the end of the Christian Reconquest of the formerly Islamic lands. This led the moriscas to replace the Islamic veil with the Castilian manto to cover their identities while holding on to a cultural tradition.57 This Andalucian morisco custom was quickly adopted by Christian women in Granada, Córdoba and Seville giving birth to the Iberian tradition of the tapada. This fashion traveled to the New World from Seville and found its new abode in Peru.58

In the article, “*La patria como mujer: el cuerpo femenino y el imaginario nacional en la visión de Melchor María Mercado (Bolivia, siglo XIX)*,” Seemin Qayum argued that the aristocratic women wore the exotic manto because of its allusion to the orient and the Muslim world.59 Further, he argued that the tapada was an

57 Meléndez, *Patria, Criollos and Blacks*, 224.
58 Martín, *Daughters of the Conquistadores*, 300-301.
oxymoron; while women covered their faces, they drew attention to their figure, alluding to their sexuality. Yet, Qayum further argued that this irony was a representation for the larger political figure of Peru which was fighting for its independence from Spain during the early nineteenth century.\(^{60}\)

In addition to the Islamic-rooted tradition of the *manto* were the baroque Limenean balconies with *celosia* covered windows, constructed in the *mudéjar* style of architecture, which offered a place where women could watch city life. Onlookers would be able to catch a glimpse of the feminine figure, but they would never be able to identify the woman who peered down at them. *El balcón limeñeo*, by Fiol Cabrejos, studies various architectural styles of Limenean balconies. He mentions in his introduction that the balconies were a combined style of Hispanic-Arab architecture, having roots in the *mudéjar*. In *Mudejar Crafts in the Americas*, Thomas Ballantine Irving states that many of the carpenters of *mudéjar* architecture in Spain were Muslim workmen who were allowed to stay in the Iberian Peninsula. Further, many of these craftsmen were contracted to go to the New World Spanish colonies during the sixteenth through seventeenth centuries, bolstering his argument that the *celosías* were built or designed by Islamic craftsmen. While there is literature identifying Arab roots for the baroque wooden balconies of Lima, there is scarce scholarship connecting the role of balconies to that of *tapadas*.

**Methods**

Using textual analysis of recent essays addressing the *tapadas limeñas*, I will situate the role of women in Colonial Lima and examine how Peru was influenced by Spanish-Moorish styles

\(^{60}\) Ibid., 398-99.
and expectations concerning women’s character. By combining a study of secondary sources, including scholarly journals, and a close examination of travel journals from the eighteenth and nineteenth centuries, I am testing my assertion that the attire of the tapadas and the architecture of the carved wooden balconies have roots in the Islamic traditions in Spain during the Middle Ages and in the Early Modern period.

I am comparing the role of the tapada’s manto and saya in colonial Peru to that of the hejaab worn by Muslim and Morisco women in Spain and the Middle East during the Middle Ages through the Early Modern periods to discover and explain how the veil changes meanings as it moves to a different context. By reviewing foundational texts, such as “A One-Eyed Gaze: Gender in 19th Century Illustration of Peru,” by Deborah Poole, and the nineteenth-century anecdotal histories of Ricardo Palma, I evaluate the freedom gained and forfeited by Peruvian women who chose to wear a veil. In this essay, I study travel journals with recorded perspectives on women in Lima, sketches and water-color paintings of tapadas, as well as photographs of architecture from relevant periods.

I also observe briefly the resistance by Spanish kings from Philip II through Charles III to conceptualize the perspectives of Europeans towards Islamic-rooted traditions, and to artistic representations of tapadas from the nineteenth century in order to directly interpret these stylistic preferences. Additionally, I consider the role of carved wooden covered balconies in Lima, paying special attention to their presumably Morisco carpenters and mudéjar design. Limenean balconies provided an opportunity for tapada women to take off their veils and continue their watch of Lima’s city-life without being seen. However, while women

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61 Irving, Mudejar Crafts in the Americas, 1.
continued to see and not be seen by standing in these balconies, this civic participation was static where as the *manto* and *saya* allowed active involvement. The *tapadas*, when in their customary dress, were able to walk and interact with the men and women of Lima. By studying the role of the *tapada*, her apparel and lifestyle as expressed in travel logs, I will test my thesis that Islamic traditions came to Colonial Peru, but transformed to fit social contexts.

*Las Tapadas Limeñas*

Figure 1 Tapada limeña, Sancho Fierro, 19th c.

The nineteenth century journals of Flora Tristán and stories of Ricardo Palma suggest that the *tapada’s* veil was a fashion that
was to be found exclusively in Peru. However, according to current scholarship, the use of the Castilian *manto* as a veil only started after Islamic veiling was outlawed in Spain in the sixteenth century, most probably with memories of the Reconquest still on the minds of Spanish monarchs. *Morisco* women in Granada, who made attempts to hold on to their cultural and sometimes spiritual roots started using the *manto*, which was formerly merely a shawl typical of Spain, to cover themselves revealing only one eye. The Castilian women of Granada were intrigued by this new fashion and thus started wearing the apparel that came to be known as that of the *tapada* when reaching Lima. This style traveled to Seville from Granada and appeared in Lima at the same moment that Andalucian women began immigrating to Latin America. This phenomenon was most prominent in Lima, where, according to travel records, it is believed to have started in the second half of the sixteenth century, but was also present in other parts of Latin America to a lesser magnitude. The first recorded *tapada* in Peru, according to Ricardo Palma, was doña Teresa de Castro, wife of the viceroy don García Hurtado de Mendoza of Cañete. The conservative viceroy’s family believed in protecting the beauty and chastity of the aristocratic women of the household and sought to protect the veiled fashion against the wishes of ecclesiastic and governmental officials who attempted to outlaw the style.

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63 *ibid*. While the *manto* and *saya* were worn in other parts of Colonial Latin America, particularly in Chile, the style in Lima was more distinct in that the *manto* was completely opaque, not allowing for one to detect who the woman was behind the veil. The *manto* or *mantilla* in Chile was also known for its roots from Spanish Moors. However, while this veil covered all but one eye, it was sheer, showing the woman’s face and the coquettish nature it had taken. Cruz de Amenábar, Isabel, *El traje: transformaciones de una segunda piel*, 51.
64 Brañez Medina, *El vestido femenino limeño*, 69
The *tapada’s manto* and a *saya* were made of the finest silks from India and China. The *saya* emphasized the body, especially the buttocks of the wearer, and showed her small feet and lace undergarments (Figure 1).\(^{65}\) This fashion continued for 300 years to the 1860s, almost forty years after Peru gained its independence. At this time, the women of Lima began to take down their veils, dressing in the attire of other Latin American women who had adopted the French fashion.\(^ {66}\) Though the attire of the upper-class women no longer carried the religious implications of the original wearers in Andalucia immediately after the Reconquest, the fascination of Creole women in Lima with the orient gave the fashion its longevity. Further, the *manto* and *saya* were garments reserved only for the upper-class women of Lima, meaning that this was a practice that was not permitted to mulattas, or to the indigenous peoples.

The *manto* and *saya* of upper-class women in Lima had implications ranging from chastity to licentiousness. Carrió de la Vandera, Spanish postal official in eighteenth-century Lima, communicated in *“Lazarillo de ciegos caminantes,”*

> El vestido limeño de velos es signo de honestidad…y en lugar de remontarse a la herencia árabe…dice que ‘nada se sabe con certeza del origen de este traje, pero yo creo que quisieron imitar las pinturas que se hacen de los ángeles.’\(^ {67}\)

\(^{65}\) Martín, *Daughters of the Conquistadores*, 281.

\(^{66}\) Brañez Medina, *El vestido femenino limeño*, 75.

\(^{67}\) The veiled clothing of the Limeña a sign of honesty…and rather than going back to her Arab inheritance/heritage…he said that ‘you do not know anything with certainty about the origin of this attire, but I believe that they wanted to imitate the paintings that they made of the angels.’ Carrio de la Vandera, *El lazario de ciegos caminantes*, (402).
Vandera was either unaware of or did not want to remember the origins of the fashion which has roots in Islamic Spain. Rather, he saw it for its signs of chastity, honesty, and seraphic appeal. This shows that by divorcing the saya and manto from their origins in the Arab world, Vandera saw the wearing of the manto and saya for the same implications it had for the morisco women in sixteenth-century Spain, who wished to continue veiling themselves out of both custom and chastity. While the tapada was met with great legal opposition, the manto and saya were sacred to the wearer. In his travel logs, J.J. Von Tschudi explains,

A Tapada indulges in a vast deal of freedom when in the streets, and scruples not to make satirical observations on anybody or anything that strikes her as strange or ludicrous. The veil, or manto, is sacred, and should a man attempt to remove it by force, he would run the risk of being severely handled by the populace.68

This shows that the manto was more than a veil to the tapadas limeñas, it was a choice, a practice and a liberty they refused to have taken from them.

A contrasting view of the tapadas found in the texts of several male journal writers of the time was that these women were tricksters and took pleasure in deceiving men in the streets of Lima in regards to their identity. According to nineteenth-century British naval officer, Captain Basil Hall, women dressed in the manto and saya before sunset to go to the streets and promenades so as to interact with other persons while completely disguised by the uniformity of their veils. Hall describes:

…the saya and manto afforded much amusement, and sometimes not a little vexation. It happened

68 Tschudi, J.J. Von, Travels in Peru on the Coast, 55.
occasionally, that we were spoken to in the streets by ladies, who appeared to know us well. I myself knew two young ladies who completely deceived their brother and me… and so completely did they deceive our eyes, and mislead our thoughts, that we could scarcely believe our senses, when they at length chose to discover themselves.\textsuperscript{69}

Hall demonstrates that the degree in which women were able to alter their appearance deluded even the people closest to them, showing the unease in men who viewed the \textit{tapadas} as figures of their amusement. While the scene Hall narrates may have been viewed as a game, it alludes to the concerns of church officials in relation to what these anonymous figures could do to the morals of society. The circumstances of the \textit{tapadas} in the Peruvian capital show a conflicting relationship between the Creole women of Lima in relation to Spanish viceroys and clerics in the viceregal capital. This relationship reflects the fresh memories of Spain’s Reconquest from the Moors which had ended just in 1492. The \textit{tapadas limeñas} were given a reputation for satisfying the carnal desires of men both by their mystifying appearance and by the assumption that these women were prostitutes based on the generalized reputations of the veiled women in Spain,\textsuperscript{70} as will later be elaborated. The \textit{manto} and \textit{saya} were too often seen as objects of seduction,\textsuperscript{71} and created controversy in this conservative legal sphere. Thus, for a woman to participate in a practice that could deceive her own siblings was not only controversial, it was blasphemous.

\textsuperscript{69} Hall, \textit{Extracts From a Journal}, 23.
\textsuperscript{70} Rodilla, \textit{Escrito en los Virreinatos}, 85.
\textsuperscript{71} Denegri, \textit{Abanico y la Cigarrera}, 63.
The role of the *tapada* in an ecclesiastical setting was of great controversy in colonial Peru. The costume so reminiscent of the Arab world and Moorish Spain had great difficulty situating itself in the context of the Catholic Church. According to Poole, ecclesiastics demanded to discern the identity of any woman who entered their church, requiring that the women reveal their faces when they went to the churches and cathedrals for prayer.\(^{72}\) Whether this was for protection of the church from non-customary behavior, or simply to not give heed to this enduring Islamic-rooted fashion in Peru is not clear. As described by Martín, this was significant because the *tapadas* constantly flowed into and out of the churches, offering candles to their most adored saints.\(^{73}\) Considering that the majority of upper-class women in colonial Lima wore the *manto*, this could be seen as a method of singling out women wishing to practice their Catholic beliefs while holding onto what had become a cultural custom. Negative sentiments against the *tapadas* continued in the church which considered the fashion “an abomination to God.”\(^{74}\) The idea of a woman who could be so well disguised as to fool her brother or her father led to the possibility of incestuous thoughts, which went against church doctrine. Yet, it was not the *tapada* who committed the sin; rather, it was the man who viewed her with such intentions. In the nineteenth-century image by Rugendas, one may see the negative attitude of the ecclesiastics against the *tapadas* in this painting where the women have their faces uncovered (Figure 2).\(^ {75}\) In this painting, Rugendas shows the friction between the women wearing the *saya* and *manto* proudly, asked to uncover their faces, and the

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\(^{72}\) Poole, *One-Eyed Gaze*, 338.  
\(^{73}\) Martín, *Daughters of the Conquistadors*, 282.  
\(^{74}\) Denegri, *Abanico y la Cigarrera*, 61.  
\(^{75}\) Poole, *One-Eyed Gaze*, 357.
friar who peers at them from below his brow. The women, as depicted by Rugendas, manifest a confident and elegant demeanor—one which was surprising in a culture where upper-class women had few rights. Though the tapadas showed themselves as being pious, it was difficult for the men of the church to easily accept their presence.

Figure 2 Tapadas passing the portals of the plaza mayor in Lima, Rugendas, 19th c.

The manto in Early-Modern Spain and contrasts in Colonial Peru

Spanish kings from Philip II to Charles III attempted to outlaw the tapada but were unsuccessful due to the women who had become accustomed to this practice which brought them
greater liberties. In its original state in Spain, the style which had originated in Granada and migrated to Seville had also found its way to Madrid. In Madrid during the sixteenth century, many Spaniards saw the benefits of the *manto* worn as a veil to escape recognition while engaging in criminal activity. Non upper-class women, prostitutes, and men wishing to commit crimes were known to dress in this fashion,\(^76\) creating a greater annoyance with the veil in the Spanish legal sphere. While these laws were passed in Spain, the viceroys in Peru acted as the voice of the sovereign and attempted to implement the same laws in Lima. The fashion did not live for a significant time in Spain, but it was enough to create animosity towards the disguised wearers of the veil. Philip II attempted to prohibit the *manto* in 1590 for its seductiveness, Philip IV made the stakes more severe in 1639, ordering that women pay a large fine of ten thousand *maravedies* and mandating that the *manto* should be confiscated. The final prohibition came from Charles III in 1770,\(^77\) but the *tapada*’s garments were worn for nearly another hundred years before the fashion finally faded in the 1860s, nearly forty years after Peru had gained its independence from Spain.

Upper-class women of Lima were the most protected of this colonial society. Their chastity and interactions with only persons of their own class were part of the protections of their family honor.\(^78\) With traditional society holding the female half to such standards, the upper-class women found refuge in a tradition that would disguise their identity, allowing them to act freely without jeopardizing their reputation. In order to hide their family’s identity, the *tapadas* would often leave their most beautifully

\(^76\) Meléndez, *Patria, Criollos and Blacks*, 224.
\(^77\) Rodilla, *Escrito en los Virreinatos*, 84.
\(^78\) Martín, *Daughters of the Conquistadores*, 280.
embroidered *mantos* at home to camouflage themselves when faced with an acquaintance. Instead, they would choose a *manto* that would be more stylistically consistent with the rest of the women in Lima.  

79 While upper-class women who did not wear the *manto* and *saya* stayed separate and above Limenean society watching urban life, the *tapada* interacted with individuals of all classes in contexts such as markets, bull fights, plays and musical events.  

80 Further, women had the opportunity to have flirtations with men if they chose to do so, being given the same liberties men often exercised. When speaking of women in Lima, Flora Tristán points out that the *limeña* often would run into her husband, who would not recognize her due to the veil which disguises both her figure and voice, flirting and provoking remarks from him.  

81 However, with this traditional society and the covered nature of the *tapada*, there is little evidence that such a rendezvous would be much more than a walk in the promenade or along city streets for the typical *tapada*. Moreover, Tristán discerns that within the *tapadas*, there were distinctions between women who wore the veil for its autonomic benefits and those who were courtesans. Namely, the typical *limeña* would choose a darker *manto* to veil herself because the lighter ones had been adopted by courtesans.  

82 However, as a national costume, the *manto* and *saya* would have these negative implications in very specific contexts, yet the typical *tapada* used the veil in order to gain greater rights in society.

As shown by Spanish travel writer Philip Bauzá, the *tapadas* exercised a certain liberty under their *manto* that in Paris

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79 Poole, *One-Eyed Gaze*, 334.
80 Martín, *Daughters of the Conquistadores*, 282.
82 Tristán, 209.
would be reserved for men, and would not be dared by women.\textsuperscript{83} Women gaining freedoms equal or similar to those of men in France represents the key issues of the controversy over the tapada, as it symbolized the growing role of non-monastic women in this Catholic society. Further, Tristán observed that the tapadas had more freedom when conversing with others in the promenades than men, whose faces were uncovered.\textsuperscript{84} The rights of the two sexes in what had been a relatively anachronistic social context threatened the status quo. In Daughters of the Conquistadores, Luis Martín states,

the shawl had become a tool and symbol of a powerful social, religious, and political protest….The tapada may not have been fully aware of it, but with her shawl she was making a loud and public statement against the established and widely accepted code of female behavior.\textsuperscript{85}

Hence, while the tapadas limeñas were faced with great legal and ecclesiastical opposition for the dangers they posed on social customs, veiling was nearly required for the upper-class women of Lima who wanted to be a part of Lima’s urban culture. Similarly, a style of covered architecture came to the viceregal capital that would allow the limeñas to maintain their disguise.

\textsuperscript{83} Denegri, Abanico y la Cigarrera, 60.
\textsuperscript{84} Tristán, 212.
\textsuperscript{85} Martín, 299-300.
Mudéjar Balconies in Lima

Figure 3 Wooden Balcony of Torre Tagle Palace in Lima

Figure 4 Cairo, a street in Tulun quarter; Kheiri

The idea of seeing without being seen and participating in city life with anonymity went beyond the saya and manto. Islamic-rooted aesthetic traditions were also manifested in much of the architecture of Peru, especially in the closed wooden balconies that were overwhelmingly in Lima. These balconies are famous for their celosia, or carved wooden windows which prevented passers-by from viewing inside the upper-class homes (Figure 3). In Islamic Architecture, Kheiri shows a photograph of a street in the Tulun Quarter of Cairo (Figure 4). The homes of this street are adorned with an array of balconies with celosías of all shapes and sizes. This shows that the covered balconies with celosías were not just a phenomenon that started in Peru, but that they were also present in the Islamic world. Further, Irving states that much of the mudéjar architecture present in Latin America was built in the sixteenth and seventeenth centuries by Muslim carpenters contracted in the new Spanish colonies. This Islamic-rooted influence on aesthetics was strongly felt in both the clothing and the homes of colonial Lima. In Arte Mudéjar in America, Toussaint discusses that the celosías were built to let in air and light due to the humidity of Lima. Aside from their architectural function, these balconies also told a story of the upper-class women in the Peruvian capital. Travel writer, George Squier, related an anecdote of returning to Lima and looking at a home which he had watched the construction of years earlier. Squier recounted looking to the balcony of this structure, noticing that some of the color had washed out of the façade of the building, stating, “I was more than compensated for the loss of color by glimpses of dark eyes and ivory shoulders through the tantalizing

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87 Irving, Mudejar Crafts in the Americas, 1.
88 Toussaint, Arte Mudéjar en America, 81.
Venetian blinds that now formed the front of the balcony.89 This account by Squier illustrates the story of the women who stood on these balconies, originally built by Islamic carpenters, watching what would happen in the streets of Lima. Standing on the balconies was a means for the limeñas to be involved in the urban community without ever leaving their homes. The balconies of Lima were more than an Islamic-rooted architectural trend that spread throughout the city; they often told the stories of the women who stood and watched—women who may well have been the tapadas but were able to take down their veils while continuing to be in the covering of these mudéjar Limenean balconies.90

When he was looking up to the balconies of Lima, Squier further stated,

I should like to know precisely what portion of each day the beauties of Lima spend in these cages, whence they can look down on everything that passes in the street below, with the pleasing

89 Squier, Incidents of Travel, 43.
90 Perhaps the set of balconies pregnant with the most exciting set of stories of women in colonial Lima were that of Micaela Villegas (La Perricholi) (Figures 5). Well known for her great memory and talent in the theater, Villegas was a singer, dancer, actress, and the mistress of Amat y Juniet, the viceroy of Peru from 1761-76. As described by Ricardo Palma, La Perricholi was not a woman who would be considered for her beauty; however, she carried herself with such grace which made her beautiful. Villegas gained her name, La Perricholi, after the viceroy found himself angry at her and called her a perra chola, or a “half caste bitch,” which with his Catalonian accent sounded like Perricholi. As a woman who was often in the public eye, the name held on to Micaela Villegas, but was no longer taken for its derogatory meaning. The balcony of Perricholi is a fine example of the use of these Andalucian baroque balconies by the women of Lima who watched city life. As stated by Von Hagen, “From [her home’s] balconies, La Perricholi could watch the arrival of her regal lover, the Viceroy Amat, in his six-wheeled carriage” (22).
assurance that no upturned eye can penetrate the mysteries of their retreat, or discover if their toilets have been made. (Figure 7)⁹¹

In this passage, Squier touches upon the idea of the fare maiden looking down from her tower to the kingdom, or as it is here in the context of Lima, the limeña viewing the Plaza del Armas, the urban center of Peru. Each woman could watch and not be seen, feeling like a part of society without leaving her home. She had the freedom to observe without risking anyone discovering who she is and, as Squier alluded, that she had not put on her makeup. However, there would certainly be discontent with caged, stagnant, social participation in sixteenth through nineteenth-century Lima. While in the balconies, the women would watch, but not partake in city life. Though their reputation and family honor would not be risked by the actions of the tapadas, their presence in the community would be static. Alone, the balconies with celosía windows were a step forward for upper-class limeñas who became more involved with the city activities through awareness; nevertheless this would have to be combined with another form of observation to create the liberation the women hoped for when covering themselves and disguising their identities. The manto offered this step towards women’s liberation in colonial Lima. As discussed earlier, the tapadas limeñas were seen to have many of the freedoms men had in France. Upper-class Creole women who did not wear the manto were not able to associate with persons of other social classes or with the opposite sex as easily as the tapadas. This set of women was in many ways like the women who only stood in the balconies, merely watching the city from above and never experiencing it from within. Yet this brings into

⁹¹ Squier, Incidents of Travel, 43-44.
question how the veil of the tapada changed so drastically from its original Islamic roots.

**Figure 5** Interior of one of the balconies with celosias of the Torre Tagle Palace, Toussaint

**Figure 6** Hejaab Amira Ghaliy al-Whabiya in Saudi Arabia, 18th c.
The *hejaab*, or covering of the woman’s hair, face and/or body is a familiar practice among the Islamic world. It originated from the Quran where women were expected to cover themselves in order to be known as believers and to reveal their beauty only to their husbands. The only other men who could see the Islamic woman without her *hejaab* were either forbidden by Islamic law or
by nature to lust for these women. Like the *tapada*, the *hejaab* which originated in Islam during the seventh century gave freedom to its wearers, but of a different context. The liberation of the Islamic woman was spiritual. She would be permitted to worship God without the risk of men lusting for her. By wearing the *hejaab*, she prevented men from sinning and preserved her beauty for her betrothed. The *hejaab* then found its way to Granada during the Middle Ages in the form of the *Almalafa*, which had many of the same details as the *hejaab*, but, as shown in Figure 9, the wearer would cover herself in a manner similar to the *tapadas limeñas*. At this point, and through to the early sixteenth century, the veil worn by the *moriscas* of Spain held onto this tradition.

However, the *tapada*, with her *manto* and *saya*, created liberty in a different sphere. Where the Muslim woman was free to practice her devotion to God, the *tapada* liberated upper-class women in Lima’s colonial society. She did what she pleased and her autonomy became an icon of colonial Lima. Wearing the *manto* began as a form of protection for upper-class women who did not wish to be seen by the public in order to protect their chastity and honor. Regardless, while others were critical of the women who wore the veil, the mixed opinions of the *tapadas* had an indirect effect on the manner in which the *manto* and *saya* would be worn into the latter half of the nineteenth century. The social implications changed into a mode of liberation for the upper-class woman who wanted to leave her home and interact with people of other classes. This uniformity and anonymity of the *manto* allowed the *tapadas limeñas* to expand the role of women in Lima, becoming possibly the first feminists of the region. By the

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92 According to the Quran, the only men who are permitted to see a Muslim woman without her *hejaab* are either close relatives or castrated men. *Quran*, “Suras 33:59 and 24:31,” 192, 237.
time that this fashion faded, women in Lima were becoming more educated and leading literary and artistic salons much like those of French women. 93 Upper-class limeñas had a stronger voice in a society that once kept them in their homes with only the escape of going inside their balconies to become a part of their urban community. Yet, these same balconies were the manner in which the tapadas continued to participate in metropolitan life when uncovering their hair and face. The covered women of Lima wearing the Islamic-rooted fashion of the manto not only changed the meaning of the veil, but also changed the public perception of the wearer, giving women a more active role in Lima. While the veil, in its origins, signified chastity and spiritual traditions, it transformed into a secular fashion. The liberties gained by the women of Lima through disguising their identities gave way for the strengthening of women’s actions and voices in Andean society paving the way to more equality between the two sexes.

Bibliography


Biography
Ghezal Saffi is a Senior majoring in Molecular Biology with a minor in chemistry. Currently, she works as a mentor/tutor at San Jose State’s Peer Mentor Center. She wants to gain acceptance into a MD/Ph.D program. She wants to research the genetic factors leading to the autoimmune disease lupus. Lastly, her major inspiration comes from her older sister, who was previously in the McNair program.

Ghezal Saffi
Major
Molecular Biology
Minor: Chemistry

Mentor:
Dr. David Bruck

Understanding Genetic and Environmental Factors Related to Lupus

ABSTRACT
Lupus is an autoimmune disease that affects about 1.5 million Americans; nearly 90% of those diagnosed with the disease are female (Brescia, 2008). Each year, 16,000 Americans develop
the disease (Potera, 2005). Normally, a person’s immune system works by producing cells and antibodies that fight “germs” and infections. But with lupus, the immune system goes into a kind of overdrive and is unable to distinguish some of the body’s normal, healthy cells from foreign invaders, such as pathogens, that may cause infection (Brescia, 2008). As a result, the body creates antibodies (“autoantibodies”) against the body itself (Potera, 2005). Although genetics may contribute to the development of lupus, researchers are finding that environmental factors play an even larger role. Research has shown that environmental factors play a critical role with the development of SLE (Systemic Lupus Erythematosus). A study conducted with 45 identical twins, showed that SLE is more than just genetics (Cooper, 1997). Of the 45 twins only 24% of them, 11 out of the 45 pairs, both had SLE. If SLE were strictly based on genetics then all of the 45 pairs of identical twins should have had SLE, thus SLE must also be environmentally triggered (Cooper, 1997). Even though there are environmental factors that may trigger SLE, the genetic layout must be there.

Introduction

Many people believe that Lupus is a genetic disorder. Although genetics may contribute to the development of Lupus, researchers are finding that environmental factors play an even larger role.

My mother could not get out of bed. She was unconscious, her fingers and toes blue and white. In a panic, I picked up the phone and dialed 911. We rushed to the Stanford Research Hospital and waited hours. The doctor told us that my mother had Lupus. After getting the long and complicated definition of Lupus, the doctor looked at us and said, “Her blood has gone crazy.” At that moment, I had many questions: Why did she get it? How did she
get it? Is it fatal? Is there a cure? Can she have a normal life? Is it contagious? Am I going to get it? Is my sister going to get it?

The reason that I have such an awareness of Lupus, aside from the fact that my mother has been diagnosed with it nine years ago, is that I want to know what are the chances of developing this disease for my sister’s and myself.

**What is Lupus?**

Lupus is an autoimmune disease that affects about 1.5 million Americans; nearly 90% of those diagnosed with the disease are female (Brescia, 2008). Each year, 16,000 Americans develop the disease (Potera, 2005). Normally, a person’s immune system works by producing cells and antibodies that fight “germs” and infections. But with Lupus, the immune system goes into a kind of overdrive and is unable to distinguish some of the body’s normal, healthy cells from foreign invaders, such as pathogens, that may cause infection (Brescia, 2008). As a result, the body creates antibodies (“autoantibodies”) against the body itself (Potera, 2005). Tissues such as the skin, muscles, tendons and ligaments as well as the kidneys, heart, lungs and brain are attacked in the disease (Health Encyclopedia - Diseases and Conditions). Lupus is not a contagious disease, but there is no cure for it (http://www.arthritis-pain-cure.com/cause-Lupus-a-73.html).

**Types of Lupus**

There are three different types of Lupus. The first, Systemic Lupus Erythematosus (SLE), is the most common type. SLE is the most serious form of Lupus, and about 15% of the people who have it feel sick in their teen years. SLE can affect the skin, joints, and tendons. It may also affect other organs such as the brain, heart, lungs, and kidneys (Brescia, 2008).
The second type of Lupus is Discoid Lupus, a skin disease form causing constant rashes to the face, neck, scalp, and ears (Brescia, 2008). Although discoid Lupus is a much rarer form of Lupus than SLE, about 10% of those with it also develop a mild form of SLE. Even though discoid Lupus does not affect other body organs the way that SLE can, the rashes can cause serious physical scarring (Brescia, 2008).

The third type is Drug-Induced Lupus, in which reactions to certain types of medications can cause symptoms of Lupus to occur. For example, some anti-seizure medicines and acne medicines can cause this kind of Lupus in teens. Drug-induced Lupus is similar to SLE in the ways it affects the body, but once the medication is terminated, the symptoms usually go away (Brescia, 2008).

The main focus of this paper will be SLE.

**Cells**

The human body attacks foreign invaders by releasing antibodies that facilitate the destruction of pathogens and other usually foreign substances. Those with SLE can create antibodies for over 116 different endogenous, that is, native, proteins. The immune system fights these proteins as though they were foreign and dangerous, such as it would with viruses or bacteria (Kaufmann). There are specific elements and components of the immune system. For example, macrophages are cells found mainly in the perimeter regions of the body, such as the lungs; they engulf bacteria and other foreign substances, transport them to a special compartment (the endosome) within the cell, and destroy them through enzymatic digestion. Because macrophages take up foreign substances through their cell membranes, they are members of the immune cell family known as phagocytes.
Neutrophils are summoned to the war zones, or perceived areas of infection, by chemotactic agents. These agents are present on the surface of bacteria. Neutrophils are the main line of defense against dividing bacteria. They are also phagocytes, able to take up and enzymatically break down bacteria and other foreign substances. Eosinophils are unique phagocytes that attack larger parasites. Although they do not engulf foreign bodies, they release toxic substances onto the surface of the parasite.

Mast cells are responsible for the redness, heat, and swelling - the inflammation - of insect bites. Increased blood flow brings the redness, and heat to the affected area. The swelling is a result of the influx of fluids carrying other autoimmune cells to the tissues. The mast cells contribute to inflammation by their production and release of histamines, chemicals that can also cause severe allergic symptoms. The histamines are released in order to increase capillary permeability so that other cells of the immune system can more readily reach their targets.

Lymphocytes are the “smart” cells of the immune system. They are able to recognize specific surface features of invaders and remember them. That is why a person is unlikely to be affected by the same pathogen twice. Lymphocytes produced during the first exposure to the pathogen are stimulated to proliferate during subsequent exposures (thus showing memory for the pathogen). They in turn create antibodies specific to the pathogen. Lymphocytes include B cells, T cells, and natural killer (NK) cells. Although NK cells are not as specialized as B and T cells, they respond when the body has been invaded with viruses. If a native cell has been infected with a virus, the NK cells kill the host cell and thus the viruses within it. B cells on the other hand can recognize specific characteristics of antigens, a foreign invader. Every B cell is able to recognize a different antigen with receptors called immunoglobulin, which are antibodies on the surface of the
B cells (http://rheuma.bham.ac.uk/Lupus/causes.htm). Once the B cells are able to recognize an antigen, because the receptors match, then the B cell tells the other immune cells where the invader is. Although the response may take several days, the B cells starts a larger, more effective response. B cells make contact with T cells that recognize the same invader with their own receptors called T cell receptors or TRC (http://rheuma.bham.ac.uk/Lupus/causes.htm).

There are three types of T cells. The first is the Helper T cells which let the B cell divide and make antibodies called CD4 positive T cells. The second type of T cells is called Cytotoxic T cells which are able to recognize the cells that are invaded with antigens. They are a more specific version of the NK cells because they are able to go through our own cells for invaders. The third type of T cells are called T inflammatory cells, which are able to handle bacteria inside of our cells, known as intracellular bacteria (http://rheuma.bham.ac.uk/Lupus/causes.htm). The T cells give the okay for B cells to divide into more B cells, which in turn, produce millions of antibodies. These antibodies are released through the lymph system, which is more effective then being on the surface of the B cells because the lymph system releases into the bloodstream.

The antibodies go through the body until they come into contact with the same antigen that they were made to label. The phagocytes and the NK cells then are able to see where the antibodies have labeled and are able to respond quicker to antigens that have the antibody label on it. The NK cells then are able to destroy the antigen. In patients with SLE, the antibodies views DNA (deoxyribonucleic acid), histones, nuclear proteins, phospholipids, all essential to the patients body as foreign invaders and starts attacking and does not stop because these components are always in the body (http://rheuma.bham.ac.uk/Lupus/causes.html).
Usually when the antibodies catch a pathogen the antibodies destroy the pathogen. In patients with SLE, the antibodies can destroy vital cells because it may see them as invaders, and in turn, destroy healthy cells.

Apoptosis is programmed cell death that all of the cells in our bodies go through at some point. In Apoptosis, harmful or useless cells are eliminated (Shigekazu, 2007). Every cell eventually has to kill itself, however, under apoptosis this happens in a very controlled manner and under certain conditions. Once a cell goes through apoptosis and destroys itself, certain components of the cells such as DNA become exposed and this may lead to an immune response in patients with SLE because their antibodies may view the DNA as an invader (http://rheuma.bham.ac.uk/Lupus/causes.html).

Once apoptosis takes place, there is left over cell debris and normally white blood cells wood remove the debris from the body. In patients with SLE, the white blood cells do not perform the job accurately, and therefore the debris may trigger the formation of autoantibodies that attack healthy cells (Eustice, 2006). The problem is that the patient’s body will see this debris as foreign invaders and attack it when in fact it is just dead cells (Eustice, 2006).

Cytokines are sent from one cell to another and act as messengers. Cytokines is one of the ways that T cells get the message to start attacking. In patients who have SLE, the cytokines cells do not work properly and the macrophages accidentally send messages to the T cells and other autoimmune cells and therefore the body may start attacking itself because there is actually no pathogens (http://rheuma.bham.ac.uk/Lupus/causes.html). There is also the complement system which is a group of proteins that are present in blood and tissue. Activating the complement system activates the mast cells, causing inflammation, increasing phagocytosis and eventually killing the bacteria. This system is
activated by the complement protein C3 as well as molecules on the surface of some pathogens. Patients with SLE may have defects in certain complement proteins. The proteins C3 and C4 are often tested in SLE patients and if the C3 and C4 levels are lower than normal then this may be an indication that the patient is suffering from a flare or relapse (http://rheuma.bham.ac.uk/Lupus/causes.html).

**Predispositions and Possible Causes**

Although no one has determined the actual cause of SLE, researchers believe that some people may be more likely to develop SLE as a result of factors, which are out of the patient’s hands. For example, apoptotic cells, or cells which are programmed to die, are recognized and subsequently engulfed by macrophages and immature dendritic cells. The engulfed dead cells are transported to the lysosomes of macrophages, and their components are degraded into amino acids and nucleotides for reuse. In mammals, macrophages also engulf nuclei expelled from erythroid precursors in the final stage of definitive erythropoiesis. Failure to swiftly engulf dead cells at the germinal centers of lymphoid organs causes SLE type autoimmune diseases (Shigekazu, 2007).

Other causes of SLE may include gender. Many more women get SLE than men; there are 10 women to every one man with SLE (Brescia, 2008). Estrogen may play a role in SLE because almost all women who get SLE are of childbearing age, when estrogen levels are the highest (Brescia, 2008). Racial ethnicity may also play a role as SLE occurs more often in African-American, Asian-American, Latin-American, and Native-American women versus non-Hispanic Caucasian women (Brescia, 2008).

Family history may also play a role as 10% of people with SLE have a family member with SLE (Brescia, 2008). People who are
genetically predisposed to SLE may trigger the disease if they are faced with stress or infection. Although stress may increase one's chances of developing SLE, one has to be genetically predisposed to it (Brescia, 2008). Stress on a person who is not genetically predisposed to SLE will not make them acquire the disease. One known fact about SLE is that although it is an autoimmune disease, unlike AIDS, it is not contagious (Brescia, 2008).

**Symptoms of SLE**

Some common symptoms of SLE may include malar rash, a rash across the nose and cheeks in the shape of a butterfly (Brescia, 2008). A discoid rash, a rash with round, red, scaly patches that can appear on the face, arms, scalp, or ears (Brescia, 2008). Photosensitivity, when a person is sensitive to ultraviolet rays, like the ones that come from the sun or from fluorescent lights. Most people with SLE are photosensitive and find that the sun worsens their SLE (Brescia, 2008). Ulcers may also form in the nose or mouth (Brescia, 2008). People with SLE may also develop Arthritis. Although arthritis may hurt the joints, especially in hands and feet, the arthritis does not damage the bones (Brescia, 2008). Serositis, which is a collection of fluid near the linings covering the heart, lungs, or abdomen, is also a common symptom of SLE.

SLE may also lead to organ damage. For example, kidney problems are another symptom of SLE. Most people with SLE will develop some form of kidney problems, but only about half of them will have permanent kidney damage (Brescia, 2008). Kidney damage may include inflammation of the kidneys, also known as nephritis and that can impair their ability to get rid of waste products and other toxins from the body effectively. Although there is usually no pain associated with kidney involvement, some patients notice swelling in their ankles (Grossman, 2006). Due to the fact that proper kidney function is vital to the overall health of
a person, if SLE does affect the kidneys, an intensive drug treatment to prevent permanent damage is required.

Neurologic tribulations, problems with the brain and nervous system may develop, causing seizures as well as blood problems (Brescia, 2008). SLE can cause a lower than normal number of red blood cells (anemia), white blood cells, or platelets as well as immune system problems: Blood tests may show that the immune system is not functioning properly (Brescia, 2008). A Positive ANA test is another symptom of SLE, as this blood test shows a certain type of antibody and about 95% of people with SLE have a positive ANA test (Brescia, 2008).

Other symptoms of SLE may include pleuritis, or inflammation of the lining of the chest cavity, causing chest pains, particularly with breathing. Patients with SLE also may get pneumonia (Grossman 2007). SLE may also affect a person’s central nervous system. In some patients, SLE causes headaches, dizziness, memory disturbances, vision problems, seizures, stroke, or changes in behavior (Grossman, 2007). SLE may also cause vasulitis, or inflamed blood vessels, affecting the way blood circulates through the body. The inflammation may be mild, not requiring treatment, or may be severe and require immediate attention (Grossman, 2007).

People with SLE may develop anemia, which is a deficiency of hemoglobin. Hemoglobin is a molecule found inside red blood cells and it functions by carrying oxygen from the lungs to the tissues. Anemia can lead to hypoxia, which is a lack of oxygen in organs. Aside from anemia, SLE can also lead to leucopenia, (a decreased number of white blood cells, or thrombocytopenia which is a decrease in the number of platelets in the blood, which assist in clotting (Grossman, 2007). People with SLE may also be at an increased risk for blood clots (Grossman, 2007). Some people with SLE may have inflammation in the heart. Myocarditis is
inflammation of the myocardium; endocarditis is inflammation of the inner layer of the heart. SLE can also cause inflammation of the endocardium, the endocardium is the innermost layer of tissue that lines the chambers of the heart or the pericarditis, the fibrous sac surrounding the heart, causing chest pains or other symptoms (Grossman, 2007).

SLE can also increase the risk of atherosclerosis, hardening of the arteries (Grossman, 2007). Other side effects may include lesions over the bridge of the nose, cheeks, and on the scalp. Lesions dry into scales that fall off the body, leaving scars. Raynaud's syndrome, where there is rapid and severe reduction in blood flow may also be developed. This causes the finger to turn white, blue and cold; often it can be painful (USA Today, 2008). Patients with SLE may also become depressed due to the impact that SLE may have on a person’s body, physically as well as mentally (Hanger, 2003). Patients with SLE may form fibromyalgia, restless leg syndrome, or other sleep complications caused my muscle tension (Hanger, 2003).

Lupus can become a fatal illness. Researchers have found that 10% of patients may not live a long life; meaning 90% of patients with Lupus live a normal lifespan (Genetics in Lupus, 2008). People with SLE can typically die from it from a result of a serious infection and kidney failure (Genetics in Lupus, 2008). Although patients with SLE do not naturally have a higher risk of developing cancer, research has shown that patient with SLE may develop some type of cancer in the future as a result of certain chemotherapy drugs (Genetics in Lupus, 2008).

**Genetics**

Although still under great research, doctors believe that SLE may have a genetic link. Even though there is not one specific gene that causes SLE, there is a combination of genetic factors that may
increase one's chances of acquiring SLE. About 10-12% of patients with SLE also have a family member with SLE as well (http://rheuma.bham.ac.uk/Lupus/causes.html). About 5% of children born to people with SLE will get the disease as well (http://www.arthritis-pain-cure.com/cause-Lupus-a-73.html). Due to the fact that SLE is an autoimmune disease, the genes that control the immune system were studied first.

HLA genes are also the genes for MHC (major histocompatibility complex) class I and II. Certain MHC genes such as DR3 are more often seen in patients with SLE (http://rheuma.bham.ac.uk/Lupus/causes.html). The MHC molecules bring the antigen to the T cells. They do this based on what their genetic makeup tells them to do (http://rheuma.bham.ac.uk/Lupus/causes.html). The HLA family of genes, all located on chromosome 6, are vital controllers of the immune system (The Lupus Site). They are divided into 3 classes which include first, HLA class I genes and these genes have little to do with SLE. The second, HLA class II genes which many genes in this group are linked to SLE. In this case the combination of the DR3 and DQ2 variants, or the DR2 and DQ6 variants raise the risk of SLE by a factor of 2 or 3. These genes account for only a small part of the genetic risk for SLE (The Lupus Site). The third, HLA class III genes where many genes in this group are linked to SLE (The Lupus Site).

The C1q genes on chromosome 1 sometimes code for a variant of the C1q complement protein that is less efficient than usual. When this happens, SLE can result, especially in children. The C1q protein has both an "attack" function and a "clean-up" function in the immune system. Scientists believe that SLE can be triggered if the remnants of an immune system attack are not cleaned up efficiently (The Lupus Site). Deficiencies of other complement proteins may also lead to SLE, including deficiencies of the
proteins coded by the C4A and C2 genes on chromosome 6, and the C1r and C1s genes on chromosome 12 (The Lupus Site). Although there may not be one specific gene that causes SLE, researchers have found that there are 14 genes that are known as the interferon (IFN) expression signature that are found in all patients with SLE. The genes are turned on by IFN, a family of proteins that have a role in regulating immune responses (Eustice, 2006).

**Environmental triggers**

Although genetics plays a major role in the development of SLE, environmental factors also play a large role if not larger. Environmental triggers are various factors, outside of the patients body, which may possibly lead to the development of SLE. Environmental triggers can be mental health, medical as well as chemical. Even though there are environmental factors that may trigger SLE, the genetic layout must be there. Environmental aspects may trigger SLE in patients who are already genetically predisposed to SLE (Eustice, 2006). For example a study showed where 45 identical twins, where at least one of them had SLE were tested. Of those 45 twins only 24% of them, 11 out of the 45 pairs, both had SLE. If SLE were strictly based on genetics then all of the 45 pairs of identical twins should have had SLE because identical twins have the same exact genetics, thus SLE must also be environmentally triggered (Cooper, 1997).

Various factors that may lead to the development of SLE in some patients include ultraviolet radiation, xenobiotic organic and inorganic compounds, silica dust, infectious agents, endogenous and exogenous sex hormones, organic solvents, petroleum and this includes products that contain these items. There has also been found that there are certain environmental agents that can confuse the T cells, causing autoimmunity as well as overactive
lymphocytes (Tsay, 2008). Certain drugs can also increase ones chances of developing SLE. Hydrazine’s are compounds used in agriculture and industry, they are used in the synthesis of plastics, anti-corrosives, rubber products, herbicides/spectacides, photographic supplies, preservatives, textiles, dyes and pharmaceuticals. Hydrazine is also naturally found in tobacco, tobacco smoke, mushrooms and penicillium. Recently there has been a significant increased risk for systemic SLE erythematosus among smokers (Hess, 2002).

Also, xenoestrogens, synthetic compounds that are abundant in the environment and that mimic the action of estrogens, can affect the endocrine system and have an impact on the development of SLE. Silica dust has been reported as a risk factor for development of SLE (Hess 2002). Silcia dust is mainly present in jobs which include mining; quarrying and tunneling; stone cutting; dressing, polishing and cleaning monumental masonry; the use of abrasives or abrasive blasting; certain occupations that require manufacturing of glass; foundry work; vitrous enameling; boiler scaling; and certain occupations involving pottery, porcelain and lining bricks (Hess, 2002).

Organic solvents found in paints, varnish, lacquers, thinners, paint and varnish removers, waxes, floor and shoe polish, inks, adhesives, antifreeze mixtures, motor fuel, pharmaceutical products and preservatives have all been linked to SLE (Hess, 2002). These organic compounds have also been found in materials such as artificial rubber and leathers (Hess, 2002). Metals such as gold, cadmium, mercury, pristine have also been found to be linked to SLE (Hess, 2002). Sun exposure can not only increase the chances of developing SLE but it can also cause rashes and flares in patients with SLE as people with SLE can become photosensitive (http://rheuma.bham.ac.uk/Lupus/causes.html).
Stress may also play a vital role, although not firmly established, stress can increase the chances of developing and or worsening the condition of rheumatic diseases (http://rheuma.bham.ac.uk/Lupus/causes.html). The use of lipstick may also increase the ones chances of developing SLE. In a study conducted at Tufts Medical Center, using lipstick at least three times a day every week greatly increased the chances of developing SLE (Wang, 2008). The reason for this may be that chemicals that are present in lipsticks may be absorbed through the buccal mucosa and have biological effects (Wand, 2008). Research has even shown that Human parvovirus B19 infection may have something to do with the start of SLE (Lunardi, 2008).

Influenza vaccines may also increase the chances of developing SLE. From 92 adults that were given the annual influenza vaccine blood samples from before and after the vaccine show that about 15% of the people had increased levels of autoantibodies and new autoantibodies (Toplak, 2008). The levels of vitamin D may also have some impact on SLE. For example, recent studies have shows that vitamin D deficiency may increase the chances of SLE because people with SLE sometimes have lower levels of vitamin D (Kamen, 200). Pregnancy may also have an impact and increase a female’s chances of developing SLE. In some cases SLE may also lead to sterilization due to the autoimmune ovaritis or antiphospholipid antibodies (Le Thi Huong, 2008).

A recent study at the Case Western Reserve University in Cleveland, OH found that sleeping on average of more than 7 hours per day lead to increased chances of Multiple Sclerosis, confidence interval, antidepressant use, as well as and SLE (Patel, 2006). Other environmental factors that can an increase the potential to develop SLE are the use of hair coloring products, cigarette smoke or even some preservatives in food. Exposure to UVA as well as UVB can increases ones chances because these
ultraviolet rays can damage the skin thereby modifying DNA, causing SLE syndromes to develop (Cadena, 2007). Ultraviolet-B exposure as well as viral infections can also increase the chances of developing SLE (Recent Advances and Opportunities in Research on SLE: Environmental Influences and Mechanisms of Disease, 2008).

Researchers at Indiana State University have found that phthalates trigger SLE antibodies in a mouse model. Phthalates are found in adhesives, cosmetics, fragrances, vinyl flooring, polyvinyl chloride pipe, certain toys as well as medical supplies. The effect of phthalates have been found to be greater in women 20-40 years of age (Potera, 2005). This may also be a reason why more women have SLE in comparison to men because phthalates is commonly found in cosmetic items (Potera, 2005). Some infections such as Epstein-Barr virus may also help develop SLE in some patients (Eustice, 2006). Echinacea Purpurea, also known as the purple cone flower often used to heal a sore throat, may also increase the development of SLE (Eustice, 2006). Antibiotics such as Bactrim, Gantrisin, Septra may start the onset of SLE (Eustice, 2006).

Although environmental factors and genetics play a large role in the development of SLE there are other factors that can contribute to the development of the disease as well. In most studies, 90% of patients with SLE are women (http://rheuma.bham.ac.uk/Lupus/causes.html). Age also plays a significant role as women in the 16-40 age group have a higher chance of developing the disease, which also shows that hormones play a large role because those are reproductive years (http://rheuma.bham.ac.uk/Lupus/causes.html). It has been shown that women who have SLE and get pregnant get worse during pregnancy and after taking birth control pills. Race can also play a role in the development of SLE as SLE occurs more often in
people who are of Afro-Caribbeans, African-Americans, Asians decent (http://rheuma.bham.ac.uk/Lupus/causes.html).

Treatments
Although there may not be a cure for SLE at this time, there are several different ways to treat the disease. For example one way would be through taking corticosteroids. Corticosteroids usually can decrease most symptoms of SLE (Lupus Foundation). Corticosteroids help by controlling inflammatory responses and suppressing them (Hanger, 2003). A common corticosteroid that is prescribed to SLE patients is, Prednisone (Hanger, 2003). People with SLE may also develop focal neurological deficits with high intensity lesions in fluid attenuated inversion recovery (FLAIR). These conditions greatly improved with corticosteroids (Kimura, 2008).

Anti-inflammatory drugs such as Asprin will also help by relieving the symptoms (USA Today, 2008). Other drugs for other illness can also help. For example, antimalarial drugs such as chloroquine phosphate may be effective as hydroxychloroquine can help with rashes, arthritis and malaise. Immunosuppressive and cytotoxic drugs such as Immuran (azathioprine) and Cytoxan (cyclophosphamide) help with controlling the immune system (USA Today, 2008). In some cases, Chemotherapy can even be given. Chemotherapy can be given in either the form of a pill or in the form of an intravenously. Chemotherapy works by suppressing the body’s natural reaction to stimuli, causing the immune system to react less often (Hanger, 2003). My mother, for example, was given three cycles of chemotherapy that helped suppress her immune system. Although chemotherapy is helpful, patients need to be fully aware that they are limited to staying home in order to prevent the possibility of catching a simple cold.
Rest, exercise, physical therapy for muscle weakness, limited sun exposure have shown to help with the symptoms (USA Today, 2008). Although kidney disease can be a large part of SLE, lowering blood pressure and taking drugs that can block the rennin-angiotensin aldisterone system help with slowing kidney disease (Nguyen, 2008). Patients with SLE may also be prescribed antidepressants because these can help with muscle tensions while the patients are asleep (Hanger, 2003). Often chemotherapy is given to patients who have a very strong form of SLE, usually when it causes major organ damage (Hanger, 2003). Vitamins and minerals can also play a major role with SLE patients. For example, vitamin C is great because it can help fight against colds (Hanger, 2003).

Significance to me

Researching SLE was a very important to me because my mother was diagnosed with it when I was thirteen years old, eight years ago. Knowing that SLE is a genetic disorder I wanted to find out what chances my sister or I had of developing the disease. If it were purely genetic there would be an extremely high chance that I, or my sister, would develop the disease. Now, if it were environmental then my chances could increase or decrease depending upon the conditions. At this point, I need to be able to step back and see the actions that I need to take to help me fight SLE, or at least decrease my chances.

Conclusion

Although it is evident that genetics plays a vital role in the development of SLE, it is also critical to realize and understand that environmental factors play a role as well, maybe even a larger role in some patients. Simple genetics is not the only reason people develop SLE. Researchers have shown that although Lupus,
particularly SLE is considered a genetic disease, there are several key environmental factors that play a role in the development of SLE as well. Stress, exercise, ultraviolet light, cosmetics and antidepressants are just a few of the environmental factors, which can lead to the development of SLE.

Researchers have shown that SLE does not have a specific formula, but rather an amalgamation of several factors. Simply having a parent who has SLE will not guarantee that the child will develop it. Similarly having stress does not mean that a person will develop SLE. Rather, it is a combination of certain environmental factors for a patient who already had the blue print for developing SLE.

Writing this paper has greatly changed my life. For starters I better understand SLE. I am able to talk to my mother about it and I am better able to explain it to her. I have also been exercising more often, eating healthier, using sun-block and taking better care of myself by better dealing with my stress. Although I may not be able to completely prevent developing SLE one day, I know that the positive actions and steps that I am taking today will better my chances tomorrow.

**Bibliography**


Biography
Erlinda will be graduating with a double major in Behavioral Science and Sociology and with a minor in Mexican American Studies. Her plans include applying to graduate programs in the fall and pursuing her research interests. She hopes to obtain a Ph.D. in Sociology and go on to teach at a University. She has a commitment to working on issues affecting the Latino community in particular those issues that deal with inequality, poverty, class, and gender.

Erlinda Yañez
Major
Sociology & Behavioral Science
Minor
Mexican American Studies

Mentor:
Natalie Borero

Food Acquisition & Preparation Strategies of Food Insecure Latina Women Living in Santa Clara County
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ABSTRACT
The purpose of this study was to understand the various ways in which Chicana/Latina women in the Santa Clara Valley exercise various strategies to acquire nutritious and culturally appropriate food for their families in light of rising food and housing costs. This study hopes to further the research conducted on issues surrounding food insecurity in urban settings. Of particular note are the potential physical, psychological, and economic barriers, which impede access to food items which are nutritious and/or native to their diets. Participant observations and semi-structured interviews were conducted in home settings to gain a better understanding of the various foods used and their preparation techniques.

Introduction
Hunger is certainly a familiar problem in developing nations and while it may seem counterintuitive to imagine hunger being a significant problem for countries considered among the wealthiest nations, it is nonetheless very much an issue as well as in developing countries. In the United States there are approximately 13 million households experiencing food insecurity. To be food insecure is to be uncertain of having or being able to obtain enough food for all members in the household to maintain a healthy active life due to insufficient money or other resources (Nord, Andrews, & Carlson, 2007). The implications for the families living with the uncertainty are significant as are the larger sociological questions about access, poverty, and equity. Mostly seen as a quality of life issue and one of the consequences of poverty, food insecurity has become a focus of
research for several decades. Three areas of interest dominate most research; measurement tools, vulnerable populations, and access. The first area focused on developing valid and appropriate measures at the household and state level. Using appropriate measurement tools a set of characteristics were then established to identify those most vulnerable to food insecurity. Issues surrounding access in Canada and the United Kingdom has been on food deserts, identifying areas with limited access to grocery stores. In the United States the issue of access is focused on food security and the uncertainty of being able to obtain the necessary foods to maintain a healthy lifestyle.

The purpose of this study is to begin exploring the various strategies used by Latina women in acquiring and preparing healthy food for their families. Currently there is very little information that focuses on the micro level of interaction between those experiencing food insecurity and the everyday food decisions made in the home. Nor has there been enough done to understand the economic and societal benefits of cultural knowledge of women as it relates to food insecurity. Furthermore, while rural Latino populations have been examined there have been few that look at Latinos in urban settings. This study will focus on women living in the Santa Clara County located within the larger San Francisco metropolitan region, an area known for its high cost of living and large Latino population.

**Measuring Food Security**

Hunger and poverty are persistent problems affecting many people in the United States. Finding a way to measure the extent to which food security is experienced is essential to understanding the depth of the problem. The U.S. Department of Agriculture has developed a valid tool of measurement of hunger and food security at the household level (Nord, Andrews, and Carlson, 2007). Data
is collected by the U.S. Census Bureau in the annual Current Population Survey (CPS) using the Food Security Supplement (FSS) to determine household level food security. The food security of these households is determined by eighteen questions about different activities and experiences that a household characteristic of being food insecure is known to experience. State level characteristics are assembled using a variety of sources: Census data, government economic reports, and program administrative data (2007, p. 2).

Through the information gathered in the surveys a set of characteristics has been identified which make some households vulnerable to food insecurity. States with above average percentages of households with these attributes also are apt to have a higher incidence rate of food insecurity: low income, low education (especially if less than a high school education), Black, Hispanic, and Native American household heads, living in the central city of a metropolitan area, three or more children, no adult in the household employed, no elderly in the household, disabled household member, noncitizen household head (Bartfield, Dunifon, Nord, Carlson, 2006).

Measuring food security and hunger rates among the U.S. population at the household level tells but one side of the story. Edwards, Weber, and Bernell’s study “Identifying Factors that Influence State-Specific Hunger Rates in the U.S.: A Simple Analytic Method for Understanding a Persistent Problem” (2006) explains that while measures of household levels of food security provide revealing information about quality of life, state-level differences in that measure can indicate significant quality of life issues between states. Another way to say this is to use the example of a Latino family of four experiences with food insecurity in Oregon, a state with high home ownership rates and a healthy economy (during the period of study), may be completely
different from the experiences of a similar Latino family of four in Texas with a large minority population and with hunger rates above the national average. Edwards, Weber, and Bernell support the use of the method of demographic standardization to gain a better understanding of state level hunger rates. They draw attention to this method as being readily available to researchers even when microdata are not on hand (p. 583). Five states were used to illustrate the usefulness of using this method, Florida which has a hunger rate just above the national average, Minnesota which has one of the lowest hunger rates in the United States. California, Texas, and Oregon western states with some of the highest hunger rates in the county are located within the hunger crescent that can be mapped out “with one tip in the northwest, following a curve along the west coast and southwest, and reaching into the Deep South” (Nord et al 2004 in Edwards et al 2006). The most significant findings of the effect of population composition and hunger rates were related to homeownership. Of the five states examined Texas and California have the lowest home ownership rates compared to the national average. They also have among the highest hunger rates, using the method of demographic standardization enabled researchers to see how the local context affected hunger for the population living in that state. For researchers interested in further investigation of quality of life issues this method offers a good first step in observing how the local environment helps or worsens the experiences of those dealing with these issues. However, it is limited in that it cannot give us more detailed information on how populations vulnerable to hunger and say homeownership rates are related.

Race/Ethnicity and Food Security

Quandt, Arcury, Early, Tapia, and Davis (2004) study “Household Food Security among Migrant and Seasonal Latino
Farm Workers in North Carolina” is one of the few studies available that focuses on the growing Latino population. Their study looked to establish a baseline of information on food security among a rural Latino population. They drew their sample from a group of mostly Mexican farm workers and their families who were part of a larger project addressing health issues related to working conditions. Analysis of the in depth interviews revealed three areas of importance: the experience of food insecurity, the emphasis of protecting children from hunger, and managing or preventing food insecurity. Analysis also demonstrates that level of education of the respondent, usually the mother, is a major predictor of food insecurity in households with children.

Developing effective economic strategies like having a savings, budgeting, and economizing (p. 573) is helpful in staving off hunger during times when economic resources are scarce or limited. While this study is one of the few to look at a Latino population, it does not look at Latinos in urban settings. Since problems of access and economic opportunity found in urban versus rural settings may significantly affect the way families deal with food insecurity it would be beneficial to also consider Latino populations who live in metropolitan areas with large populations.

Andrew Zekeri’s “Livelihood Strategies of Food Insecure Poor Female Headed Families in Rural Alabama” (2007) examines the various approaches employed by poor single mothers to provide food for themselves and their children. This study used both qualitative and quantitative methods as part of a larger study. The study used a sample of 100 female headed families in a five county area heavily populated by African Americans. Zekeri used the USDA six item food insecurity questionnaire to gain knowledge of the practices and behaviors of these households in meeting their food needs. A psychological assessment tool to measure depression to assess both depression and managing the
effects of food insecurity was also administered (2007, 1033). The women were interviewed in their homes twice over a twelve month period. The results point to several strategies used such as receiving cash aid from family and friends, food banks, church pantries, and food stamps. The psychological assessment demonstrated the psychological affects food insecurity was having on the women. The women often experienced feelings of depression, sadness, and feelings of loneliness, had trouble sleeping, and concentrating. One limitation of this study is that it focused solely on the economic strategies and did not include consideration of cultural, folk, or personal food procurement and preparation strategies which would have given insight into the actual practices used by women to provide food for their families.

Access

Another area of importance in any discussion related to food security is the concept of access to healthy nutritious food. The barriers that exist which prevent people from being able to obtain healthy foods in culturally appropriate ways are complex. In Great Britain, the focus on access has been on identifying food deserts, areas where people experience economic or physical barriers to nutritious foods. Hilary J. Shaw sought to develop a classification of food deserts based on the factors that create barriers of accessibility to maintaining healthy eating habits in her article “Food Deserts: Towards the Development of a Classification” (2006). She identified three areas in which the concept of access could be further broken into, ability, assets, and attitudes regardless of whether this was in low income or more affluent areas (2006 p. 241). Ability includes everything that physically prevents someone from obtaining the food they need who otherwise would be able to get it if they had the need and financial resources to obtain. Asset issues describe any financial
impediments that prevent someone from acquiring the foodstuffs they can get to physically and want to have. Attitudes can be defined as any psychological impediments that would prevent them from accessing the foods they would have the financial and physical means to procure.

Another approach to identifying food deserts utilized minimum distance and coverage methods to determine the accessibility of supermarkets in the Canadian city of Edmonton focusing on neighborhoods that are high need and located in the inner city (Smoyer-Tomic, Spence, and Amrhein, 2006). The results of which indicate the areas under study in general had the same or higher rate of accessibility than did the rest of the city, though they were able to identify six high-need areas that had poor supermarket accessibility (2006, p. 311). Lacking the government regulatory policies prominent in the United Kingdom and Canada, inner city residents in the United States often face depleting neighborhood resources. This is especially true in low income neighborhoods with a population concentration of African Americans (Zenk, Schulz, Israel, James, Bao, Wilson, 2005). Lacking a change in public policy or incentives for retail owners to return to impoverished areas, poor neighborhoods may have to look towards smaller neighborhood markets to fill the gap left by the disappearance or nonexistence of the larger grocery chains. Anne Short, Julie Guthman, and Samuel Raskin (2008) conducted research in three San Francisco Bay Area neighborhoods which can be characterized as having all of the social and economic factors of a food desert. Each neighborhood under study lacked a large chain grocery store located within the neighborhood, though there were some on the periphery. Residents instead depended on a variety of small markets and mid size grocery stores to obtain fresh fruits and vegetables, fish, meats, and poultry. The small family operated and owned stores under study were able to keep cost
down by employing family members, being located in low rent areas, and targeting niche markets by catering to the needs of their ethnic customers.

**Methods**

Women between the ages of 18-70 living in Santa Clara County, who did the majority of the cooking and/or who had the responsibility to obtain food for the family were recruited to participate. Participants for this study were recruited using several methods. Some respondents answered a request for participation posted on flyers that were distributed in various locations throughout the city of San Jose. Others were referred using a snowball sampling technique and who were referred by previous respondents. Several participants were recruited from the Santa Clara County Healthy Families intake and payment office. In total twenty surveys were administered and eight women were selected for interviews.

In order to determine level of food security the women were given the USDA food security questionnaire which included six questions about the experience and behavior of households under pressure to meet their food needs (Nord and Andrews, 1999). Respondents were asked the following questions:

- **Q1.** The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more. (Often true, sometimes true=1; Never true = 0)
- **Q2.** (I/we) couldn’t afford to eat balanced meals. (Often true, sometimes true=1; Never true = 0)
- **Q3.** In the last 12 months, since last October, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn’t enough money for food? (Yes = 1; No = 0)
- **Q4.** If yes how often did this happen? (Almost every month, some months but not every month= 1; For only 1 or 2 months= 0)
- **Q5.** In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food? (Yes=1; No=0)
Q6. In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food? (Yes=1; No=0)

Respondents were then scored based on the answers given. Respondents with a raw score 0-1 were classified as food secure; those with a raw score of 2-4 are classified as low food security; and scores of 5-6 are classified with very low food security. For this study those who scored 0-1 were considered food secure and all other scores (2-6) were labeled as food insecure.

Those respondents who were identified as food insecure were asked to participate in an in-depth semi structured interview. A few respondents who were not identified as food insecure according to the survey raw scores but whom self identified as having experienced recent financial problems were asked to participate in an in-depth interview. Most of the interviews were conducted in the home; one was completed at the Santa Clara County Office of Healthy Families intake and payment office. By conducting the interviews in their homes, it provided an opportunity to observe family dynamics, and general living conditions. Also in order to get a sense of how these women were dealing with food insecurity and to see what were the day to day realities for them in terms of providing food for themselves and their families they were asked a variety of questions to describe their food procurement and preparation strategies.

**Findings**

The results of the in-depth interviews revealed several interesting findings. When asked, “How decisions are made with regards to what types of food are needed?” the response most often given indicates that price is a significant factor.

“I shop at FoodMax, Safeway, Albertson’s when things are on sale or a special is running..” “Foodmax generally has everything I need. Price is the only factor.”---Nikki, 39
“I’ll go to Safeway, Dollar Tree, Wal-Mart, and The Grocery Outlet, anyplace that has a sale. At the Grocery Outlet I like to buy the frozen foods and sandwich meats, onions are $1.00 for the bag and $2.00 for the bananas.” Sonia, 37

Price of items also dictates what items are the first to be eliminated when there is not enough money to buy the needed groceries.

“Sometimes food is too expensive, so we buy less, I just won’t make the sopita or the vegetables or we buy less meat” “For example, before we used to buy 2 lbs. or more but now we buy less” --- Eva, 44.

“Meat is getting very expensive, I try to get three meals out of one meat purchase” --- Sonia, 37.

Concern over price also influences the preparation of meals. Several strategies are emphasized such as preparing meatless dishes, entrees that included a smaller portion of meat but then included more vegetables, or meals consisting mostly of rice and beans. Sonia talked about during times when there was not enough food she would employ different strategies to make the food stretch. For example:

“I’ll make beans and rice at least twice a week” and “One time it would be a bowl of chili beans as the main dish, then on another night it would be a side dish”. Other times, “Even if the kids don’t like vegetables I mix it into the rice or mix it with the meat”

Though price is an issue in the decision making process about what food items are obtained, it is not the only concern for
the women with regards to planning meals. Nutrition and the health of their families is also a major concern. Dora is married with six children and has one granddaughter who all live at home with her. While conducting an interview in Dora’s home, several family members were present. As the discussion over the preparation of foods deepens she begins to discuss her concerns about one of the older children’s cholesterol problems and other family member’s diabetes diagnoses. This has caused a change in the family’s diet. Meat once a major component of the diet has been exchanged for more vegetables. Dora also discusses how the younger children in the family have a preference for fast food and often pressure family to stop and buy the children’s meals. However due to the previously mentioned health concerns for the older daughter and a decrease in the family’s financial resources she has stopped visiting fast food restaurants and instead encourages healthier eating options at home.

Care for their family’s nutritional well being is also seen in the way foods are prepared. Esperanza, 38, an elementary school administrative assistant is a busy wife and mother of three teenage children. She invited this author to her home, to conduct the interview, while she prepared a breakfast of Chilaquiles, a favorite among her family. As she went about the kitchen preparing the meal she pointed out various preparation techniques she uses to make the meal healthier. Instead of frying the corn tortillas in a more economical vegetable oil she instead uses olive oil. Once the tortillas are at the level of crispness she desires she then transfers them to a metal strainer to let the extra oil drip out onto a dish she has put under the strainer. She also emphasized her use of fresh fruits and vegetables in the meals she makes. Many of the fresh ingredients also include various plants she named (i.e. Nopales, Flor de calabaza, Silvestres, Azelgas, Espazote) from her knowledge of them while growing up in Mexico. Some of which
could be found at the nearby ethnic grocery chain but mostly were brought as clippings from visiting or newly arrived family members from Mexico.

Nearly all of the women expressed concern about being able to provide healthy and nutritious meals for their families. Sonia, a married stay at home mother of five, expressed her feelings about her ability to prepare healthy meals. She was the most creative in how she went about feeding her large family. Her husband had recently been laid off and for several months they had to make do with very little in terms of a household income. During much of the interview she often expressed how important it was for her as the “mother” to be able to make the most of the food they had.

“I don’t feel like a good mother if I don’t provide a full course meal, like they’re not eating healthy. I try to include all three meat, vegetable, pasta, or rice, you know like white or the fried kind, sometimes with a little bit of vegetables and shrimp.” “I also try to keep my cupboards stocked with seasonings, staples, bulk items, tomatoes sauces, things that will last and that I can use to make several other things.”

Nikkie, 39, single mother of three, and a student at a nearby university also expressed concern about the way her family was eating. At the time of the interview she was having problems with her car and had difficulty getting to the chain grocery store nearest her. She talked about trying to buy enough food for at least two weeks at a time so that she didn’t have to worry about running out of food. In order to make her food budget stretch, she elected to do her grocery shopping at a discount grocery store that was far from her home. There she was able to buy turkey meat to replace the ground beef in various recipes and was able to buy enough fruits and vegetables that she could not otherwise buy at the more
expensive chain store near her home. Nikki was a recipient of a section eight housing voucher, allowing her to rent a home in a more affluent area of the city in a high performing school district. However, as part of the interview this author drove her to the grocery store nearest her home and on the way she pointed out several apartment complexes and streets that were known for their crime and for renting to “low income” people. There was a bus line not too far away however; the bus schedule did not make it easy to use as a more permanent means of transportation in an area more suited to automobile traffic.

Food Security research identifying population characteristics of those most likely to be food secure point out that home ownership is linked to food security. In other words, if you own a home you are less likely to be food insecure. One of the trends observed in this group was that several of the women interviewed were in the mist of losing their homes to the recent home mortgage crisis and economic downturn. This recent change in their economic status put a strain on the family resources. At time of the interviews from early October thru late December, many were struggling with job losses and worsening economic futures nonetheless were making a strong effort to continue to provide healthy foods for their families. Yet, follow up talks with a few of the interviewees revealed a worsening situation. Esperanza, Eva, and Dora along with their families were dealing with the impeding loss of their homes. After several months of trying to continue to make the payments on their home Eva and her husband had decided to stop making them and were preparing to move out. Struggling to find a bright spot in an otherwise dim situation, Eva mentions that in one sense she is relieved that it will soon be over, and that now they would be able to just focus on being able to get back on their feet. During the conversation it is clear that their ability to provide enough food for their family had
been a concern. She admitted, “Now we won’t have the house payment to worry about since there’s nothing left to do; now we can just make sure the kids have enough to eat and what they need.”

Discussion
Compared to the resources and available wealth of developing countries and the abundance of both here it is difficult to fathom that many families living in the United States are experiencing food insecurity. Early on much of the research regarding food security focused on measuring the extent of the problem. From that research population characteristics were also developed which helped to identify who was most vulnerable to being food insecure. The shift was then made to gaining a better understanding of the various ethnic and racial groups identified as most vulnerable. Still there was none that had taken a micro level look at how Latina women and their families dealt with food insecurity. In particular the strategies utilized to acquire and prepare the food necessary for a healthy lifestyle.

This project began by asking two very simple questions, “How do they do it?” and “What can be learned by them?” The first question reveals that these women employ various strategies to provide the food their families need. They do so creatively and under very limited circumstances. The implications for children are significant; Catherine Kenney (2008) illustrates the importance of mothers in lessening the effects of food insecurity on children. All of the women in this study purchased as well as prepared the food and therefore had firsthand knowledge the amounts and quality of the food their children ate. Further research is necessary in order to further explore the mother’s role in ameliorating the effects of food insecurity on their children.
California in comparison to the national average has a low rate of home ownership. Low ownership rates have been connected to potential vulnerability to food insecurity. However, the interviews exposed an emerging problem for families trying to hold on to homes in an area well known for its high cost of living. Renters are familiar with the unpredictable renters market and subsequent higher costs associated with it but they are not excluded from various food aid programs which do not extend to people who own a home. If the housing bust is having a similar affect on other families in the state there are a great number of them who need assistance but cannot receive any. Federal, State, and local food aid programs will need to reevaluate who is eligible and under what conditions help is extended.

Much has been written on the importance of educating Latino families about nutrition and healthy lifestyle habits. Though the findings from this study cannot be generalized for an entire population it does reveal a trend that indicates that women are very aware of nutrition and its role in maintaining a healthy lifestyle. It may be more important to focus education that builds on the knowledge they already have. A significant majority of the women interviewed were not native born. They had previously experienced poverty and deprivation in their home countries. Though they had achieved a measure of prosperity and had adopted some of the cooking methods of this country, previous cultural knowledge about food preparation strategies helped them in times of diminishing resources. It is important that we do not diminish this knowledge nor bury it in our attempt to further “educate” Latino populations. Meredith Abarca (2006) in her charlas culinarias (kitchen talks) with working-class Mexican and Mexican American women reminds of the worth that can be found in hearing woman’s voices and in their life stories. Found within
those stories “there are political and economic ramifications” (2006, p.10) that inform and educate us as well.

Finally, this exploratory study is a modest beginning hoping to shed new light on a growing problem. However, further research must be done into the different sectors providing food aid and programs attempting to diminish food insecurity. This author has been both honored and humbled by the women who have bravely invited a stranger into their homes and lives so that their voices may be heard. They shared their concerns, their knowledge, and their pain so that we may all learn and begin to find the answers we need. Nonetheless, their stories also stress the point that more voices need to be gathered from the women on the front lines that are everyday making important decisions and sacrifices in order that their families have enough to eat. Though we live in a country that provides an abundance of opportunity it may come at a cost for some and it is necessary to look at those forces which may be at the root as well as the possible solutions that may bring relief.
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A Special Thanks to All the Scholars

The McNair Scholar’s Staff at San Jose State would like to thank the 2007/2008 McNair Scholars for all their hard work and dedication. All of you have struggled through many unexpected challenges this year. Yet through it all, you have shown persistence, patience, and perseverance. All of you have accomplished great things and will continue to grow and succeed in all your endeavors. Just remember that no matter where you go, you are a McNair Scholar for life. If you ever need someone to talk too, we will be ready to listen. Good Luck with everything in the future!!!!

A Special Thanks to All the Mentors

The McNair Scholar’s Staff at San Jose State would like to thank the 2007/2008 McNair Mentors for their commitment to helping our scholars not only learn how to do research, but giving them a glimpse into your lives as professors in academia. With your help, support, and guidance through this entire year, our students have grown into budding scholars and researchers. Despite your intensive time commitment to your own work and teaching, you make time for mentoring the next generation of professors. All of you make McNair possible and we hope you continue supporting McNair in the future.