McNair Scholars Research

Journal

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BIOGRAPHY OF
DR. RONALD E. McNAIR

HE OVERCAME OBSTACLES.

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

HE ACHIEVED ACADEMIC EXCELLENCE.

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

HE BECAME A LEADER IN HIS FIELD.

Dr. McNair soon became a recognized expert in laser physics while working as a staff physicist with Hughes Research Laboratory. He was selected by NASA for the space shuttle program in 1978 and was a mission specialist aboard the 1984 flight of the shuttle Challenger.

HE WAS RESPECTED AND COMMENDED.

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

HE EXCELLED IN MANY ASPECTS OF LIFE.

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

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

Biography courtesy of the University of Nevada, Las Vegas

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DEDICATION TO
DR. HARVEY KNULL

The McNair Scholar Journal for 2009-2010 is dedicated to Dr. Harvey Knull, the previous Dean of Graduate Studies and Associate Vice President for Scholarly Activity. He retired after ten years of dedication to Texas A&M University-Corpus Christi. During his tenure, the programs under his purview experienced tremendous growth, including the funding of the first McNair Scholars Program at the university. His vision provided the framework for this premier TRIO program. He inspired students to excel and reach their goals. The staff and students involved with the McNair Scholars Program wish to extend our heartfelt thanks for his dedication and hard work.

DR. HARVEY KNULL

DEAN OF GRADUATE STUDIES AND ASSOCIATE VICE PRESIDENT FOR SCHOLARLY ACTIVITY (2000–2010)

ASSISTANT VICE PRESIDENT FOR STUDENT SUCCESS

DR. GERARDO MORENO

"Whether or not you reach your goals in life depends entirely on how well you prepare for them and how badly you want them. You're eagles! Stretch your wings."

I have often used this quote from Dr. Ronald McNair to challenge and motivate the students in the McNair Scholars Program. This journal is a testament to the hard work, commitment and meeting the challenge by students, faculty members and McNair program personnel. The Ronald E. McNair Post Baccalaureaate Achievement Program is designed to prepare undergraduate students for doctoral studies through involvement in research and other scholarly activities. The participants are first-generation college students with financial need. The McNair Program encourages students to continue graduate studies by providing opportunities to engage in research and develop skills necessary to succeed at the graduate level.

The McNair staff work closely with their scholars to make sure they complete their undergraduate studies in a timely manner, and continue with the same determination to be able to complete advanced degrees. This program exemplifies the mission of Texas A&M University-Corpus Christi, which is to help members of a group that is traditionally underrepresented in graduate education and have demonstrated strong academic potential. We are indeed honored to have these talented students, and dedicated faculty committed to excellence.

Sincerely,

Dr. Gerardo Moreno
Assistant Vice President for Student Success

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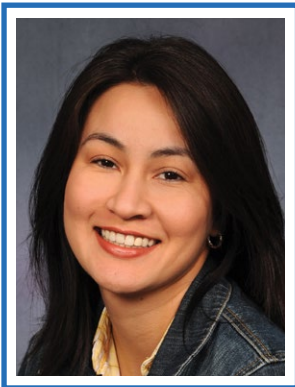
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2009 McNAIR RESEARCH ARTICLES

"OFF THE WALL": COLLEGE STUDENTS' SELF-DISCLOSURE TOWARD PROFESSORS ON FACEBOOK

by MEAGAN BRYAND
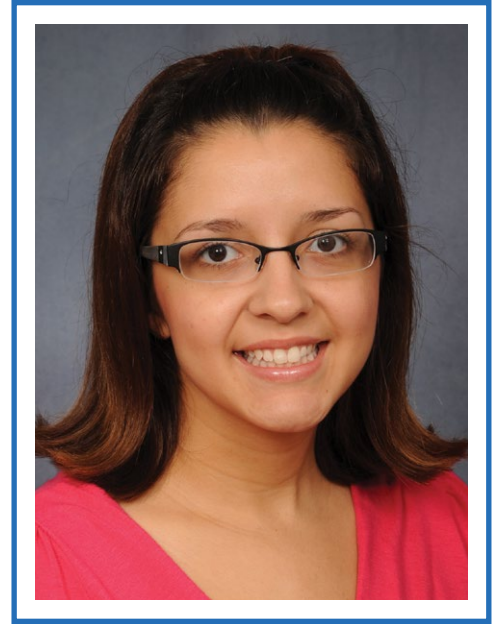
ABSTRACT

Facebook is a growing online community in which college students and professors create and manage relationships. The current study researched what applications were used by students to manage their self-disclosure toward professors on Facebook as well as what information was revealed through these applications. In addition, an unexpected recurring theme was discovered. Many students felt being friends with professors on Facebook was inappropriate in general; therefore these participants chose not to disclose any information within this online community. The other participants managed their self-disclosure mainly through wall posts, photographs/photo albums, and limited profiles.

INTRODUCTION

Online social networks such as MySpace and Facebook have set a current trend through which people commu-nicate. For this study, Facebook was the focus due to the vast number of college students using the network. Research has been done on both self-disclosure and Face-book, but as separate studies for the most part. Sandra Petronio's Communication Privacy Management theory was applied to detect the privacy boundaries the partici-pants felt were appropriate. Facebook originally started out as a college student social network wherein the only way you could be a member was if you had a college email account. Today there are no requirements to be-come a member of this society. Professors and students alike have used Facebook as a means to communicate outside the classroom environment. Before and during the "Request Friend" process through Facebook, students have taken measures to manage their self-disclosure.

The purpose of this study is for the audience to bet-ter understand that what happens outside of the class-room can be just as impressionable as what happens in the classroom through an examination of the mechan-ics used to control our privacy through settings such as Facebook. Self-disclosure is a means through which immediacy can be achieved if used correctly. Research has been done on how professors use self-disclosure, but what about how students use it? For this study, college students from a South Texas region were given prompts over a seven day period, via e-mail, in which they were asked open-ended questions. To better frame the current study, three components important to un-

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derstanding this project will be discussed: Communication Privacy Management (CPM) theory, Facebook, and Self-Disclosure.

Communication Privacy Management
Sandra Petronio's CPM theory is applicable to this study as it provides a method for analyzing boundaries of privacy in which students reveal the construct. In her novel, *Boundaries of Privacy Dialectics of Disclosure* (2002), Petronio notes that one must balance privacy and disclosure in the way we manage relationships with others. She states that CPM has five suppositions and three rule management processes.

Private information is the first supposition of CPM, wherein the information that people self-disclose is first private before it is shared. The second supposition is privacy boundaries. This assumption is a metaphor for "walls" that make a clear distinction between what is private and what is public. Control and Ownership is the third supposition, meaning that participants maintain their own personal and collective information about themselves and others. People therefore control what they disclose as well as what others share with them, such as how much is too much and how much is not enough. CPM is also a rule based management system which is the fourth supposition. Here is where Petronio argues about how privacy is handled. We set rules for our personal information that is disclosed with others and in return we expect that they abide by our expectations and vice versa. In the last supposition, Privacy Management Dialects, there is a pulling between contradictions and opposites. Individuals have the need to be both private through concealing and public through revealing. In addition to the suppositions, the rule management processes are imperative to observe.

Development and attributes are the overall aspects to consider when referring to the foundations of conceiving rules. In the first management process, privacy rule foundations, this notion is evident. Individuals develop their own rules through their own criteria (cultural beliefs, gender, etc.). The attributes that people make about their rules are simply properties. Boundary Coordination Operations is the second management process, which posits that private disclosures must be tended to. For example, a woman tells her doctor that she does not want him to inform her family members of her illness. This information is private but now co-owned, and yet still restricted to others. The boundaries are coordinat-ed by being both public between the woman and the doctor, and private from the rest of the world. Finally, the last management process, Boundary Turbulence, is most imperative. In this scenario, disclosure takes a turn for the worse and information is either misused or shared with unintended people. Rules can also be violated in boundary turbulence (Petronio, 2002).

Facebook
Computer Mediated Communication (CMC) is the generalized term for all forms of communication via the computer (e-mail, social network sites, blogs, forums, chatrooms, etc). Facebook is a social networking site where people can share pictures, leave comments on others' walls, and disclose information about themselves, all through CMC. Facebook has more than 250 million active users, one-third of its members are college students, and over one billion pieces of content are shared each week. So it was only appropriate that this online environment be chosen as the focus for this current study (*Statistics*, 2009).

Mazer, Murphy, and Simonds (2007) found that teachers who self-disclose information about themselves to students via Facebook had higher levels of student motivation, affective learning, and an immediate classroom environment. Their study focuses on how teachers use Facebook, whereas the current study focuses on a flipped perspective of how college students manage their self-disclosure toward professors. These scholars contend that student perceptions of a teacher's credibility and their reports of motivation and affective learning may also be affected by what the teacher discloses on Facebook. Mazer, Murphy, and Simonds' study should be noted for inspiration in designing this study. They too utilized CPM as a measure to analyze the construct and boundaries of their findings. It is important that we not limit our knowledge to professors' activity, because the study of student activity through this study can provide an extended understanding of the effects of these communication practices on education.

The book *Facebook Fanatic* describes the numerous applications that Facebook offers, and breaks down the methods in which people can share information about themselves. The authors note that Facebook has a clear and safe privacy policy, which other social networks fail to implement.

They also point out that, as stated above, the main purpose of Facebook is to disclose information about one's self to others in order to create an online community of like friends (*Facebook Fanatic*, 2007). The current study will discuss the main applications college students use to alter their profiles. Prior to conducting the methods, I was unaware of the numerous tools on Facebook, which *Facebook Fanatic* discusses. This is meaningful to the current study in relation to the third hypothesis. Mechanics was the rationale for this area of research.

Clara Shih, author of *the Facebook Era*, describes the many purposes of Facebook as well as its positive role as a medium for communication. She reminds us that this community is one that is casual, easy to use, playful, and spontaneous. Social filtering is important to remember when participating in Facebook activities, whether one is using wall posts, friend updates, or even advertisements on a user's page. Shih argues that there were four movements of radical new technology that formulated the way our society communicates today. In the 1970s it was the Mainframe, in the 1980s the PC, in the 1990s the Internet, and in the 21st century Social Networking. Finally, technology now connects people personally where in the past it did not. She also notes that what sets Facebook apart from other social networking sites is that it has clearly defined networks, exclusiveness, and provides continual engagement. Shih also provides a basis for the evolution of social networking as well as its uses in contemporary society. Her argument is especially important to note for this study because the environment that the participants act in is within the walls of online social networking. In relation to the current study, her view of the fourth technological movement will be used to further examine communication within a narrower scope. Professors and students must maintain both a professional and an interpersonal relationship for experiences in the classroom to be positive. Shih adds that the connection online is not only business oriented, but also used to make a personal connections as well (Shih, 2009).

Self-Disclosure

Derlega, Metts, Petronio, and Margulis (1993) in *Self-Disclosure* describe its basic meaning and how it is used in American culture, arguing that it is an innate characteristic that all individuals posses and can be considered as power. From this perspective, self-disclosure can be a weapon, an attribute to relate, or a way to relieve stress when relating with others. Both time and gender are what the authors consider to be important factors when participating in self-disclosure. Time, as explained in the Social Penetration Theory, plays an important role in that the time to give feedback can be crucial. On Facebook one can post comments on a wall and if the response is longer than an average of 1- 2 days the reason for latency may be misconstrued. Time is definitely a major factor when students and professors communicate with one another via Facebook. Gender is also vital to keep in mind because women and men converse with one another in different manners. Women seek connectivity and speak in a rapport form of communication whereas men seek information and talk in a report structure.

As cited in McBride and Wahl, the inappropriate use of self-disclosure can negatively effect the classroom environment (Kearnery, Plax, Hays, and Ivey, 1991). Jourard first coined the term "self-disclosure" in *The Transparent Self* (1964) and later defined it as "the act of revealing personal information to others" (McBride and Wahl 1971, p. 2). McBride and Wahl found that self-disclosure could be used as a tool to enhance immediacy in the classroom. These scholars applied CPM to distinguish the accepted boundaries. In their article they provide a perspective similar to that of Mazer, Murphy, and Simonds' (2007) Facebook study, in that they demonstrate how teachers manage their self-disclosure. What the current study intends to do is investigate how students manage their self-disclosure.

Before examining how students self-disclose information about themselves, their willingness to communicate online with professors must also be considered. The author first noted this issue when conversing with fellow students and finding that some were not comfortable being "friends" with their teachers on Facebook at all. This is another aspect of self-disclosure that must be addressed. Waldeck, Kearney, and Plax conducted research in which they found that in order for students to participate in e-mail with teachers, they must first be willing to use technology. This may seem dumbfounding since in today's era computers are a requirement in education, but outside the classroom students might not be as motivated to use them. This finding correlates with the current study in that students must first be willing to utilize technology to communicate and then enter the virtual community as a medium (Waldeck, Kearney, Plax, 2001).

Minimal research has demonstrated how student behaviors influence the classroom environment. While professors attempt to maintain unbiased opinions about their students and their beliefs, it is still possible that professors may predispose judgment about students in outside environments such as Facebook, which in turn may be reflected in the classroom. In the current study, self-disclosure is studied through an examination of both verbal and nonverbal cues through Computer Mediated Communication (CMC). Research has been conducted on how CMC plays a role in education. Hrastinski and Keller compiled a review of recent research over this topic, discussing the methodologies that have been used to study CMC, including empirical vs. non-empirical, qualitative vs. quantitative, blended vs. distance education, etc. They also discuss only four main journals they felt were the primary examples for researching CMC in education. Their review is applicable to the current study in that the discussion of student/teacher relationships emerges solely from academic environments (Hrastinski & Keller 2007), and has not been extended to include social networking environments.

METHOD

Participants

The participants were 22 undergraduate and 2 graduate students from the College of Liberal Arts at Texas A&M University–Corpus Christi, 3 males and 21 females. The racial/ethnic identification consisted of 37.5% Hispanic, 50% Caucasian, and 12.5% African American. The mean age of participants was 23 years old.

Procedures

Flyers were posted around the university, and through word of mouth participants were recruited on a volunteer basis. Students provided e-mail addresses, which were used as the means of communication. A Word document with instructions was first sent to the participants instructing them to answer each of the seven open-ended questions with full honesty on a daily basis for one week. The answers were collected in an open-ended format so that the participant did not feel restricted to a list of answers and could better describe their own personal experiences. They had the option of either emailing the dialy entries at the end of the seven days or once per day as they went along. Questions and comments were obtained through e-mail as well. After

all entries were completed, the results were compiled and analyzed.

Participants responded to seven open-ended questions:

Are you friends with any of your professors on Facebook at Texas A&M University-Corpus Christi?

- Why or why not did you choose to be friends with him/her?

- Before friend requesting a professor on Facebook have you or would you alter your profile?

- What applications did you use today? (Ex: photos, wall posts, basic information about yourself)

- Do you feel there are inappropriate applications on Facebook that your professor as a friend should not be allowed to view? If so, which ones and why?

- Is your Facebook profile set on private to the general public? Why or why not?

- Did you add or delete any activity on your Facebook profile today? If so what was altered?

- Did you chat with any of your professors on Facebook during this session? If so what was self-disclosed?

- Did you change your public status ("What's on your mind?") today?

- Did having a professor as a friend affect your statement? If so, in what way?

RESULTS

After the one week period, the student diaries were analyzed. Most of the students (75%) that participated in the current study claimed they felt being friends with a professor crossed boundaries of their privacy. The other participants (25%) noted that they were already friends with a professor on Facebook. Participants that were friends with professors clearly answered the proposed research questions.

Yes, I am Friends

For the first research question, "What information do students delete or hide from professors on Facebook?" participants revealed that they would not take any information off their profiles. These participants had information to neither hide nor dispose of from any individual; therefore they treated all friends, including teachers, equally.

One participant stated, "I would not alter my profile because that would be like altering my physical being. If a professor does not like something about me that is fine and I can live with it." Her response indicates that the profile is a sort of demonstration of her self through the virtual world. Control and ownership through CPM was evident in this statement. She owns all information on her profile and chose to control her profile by not changing it at all. Figure 4 expresses this relationship of co-owned information.

For the second research question, "What applications do students use most to control what they self-disclose to professors?" students managed their self-disclosure through their photos, wall posts, and limited profile applications. Because participants felt, as the saying goes, "a picture says a thousand words," they chose to delete some of them so that their teachers could not see them.

One participant stated, "I went to a keg party in which my buddy posted a picture of me drinking. I deleted it immediately so that Dr. X would not think that I am a crazy drunk." This aspect of this student was one that he felt should be public to some but private to most. Here boundary coordination operations take effect. As stated in the introduction, certain co-owned information is meant for only specific individuals to know and not the general public.

Wall posts were the second application used most frequently by participants to control what they share with teachers. Another student said, "Don't want Dr. Y to see that my friends describe me as a bitch. It is just a joke but he might think that we are being serious. That is the last thing I would want…to be known as a literal bitch!" Boundary turbulence is prevented in this situation. This student did not want others to misinterpret the understanding that she and her friends had about her nickname of "bitch."

The third application that was mentioned by the participants was limited profile. This application enabled students to allow specific people, including their professors, to view only certain sections of their profile. For example, one participant stated, "My profile is set up so that people on my 'VIP' list can see everything that I disclose. Everyone else on the 'Everybody' list can only see my basic information and my wall posts. I don't want everyone looking at my pictures of me and my part-

ner, that stuff is private." The limited profile application provided an alternate means of setting boundaries. This application was used as a polite way of sharing information but limiting the amount to be seen by certain individuals such as professors. In this scenario, the relationship became closer but not as close as those who did not use the limited profile.

FIGURE 1. Methods Used by Students to Alter Self-Disclosure (by Number of Students)
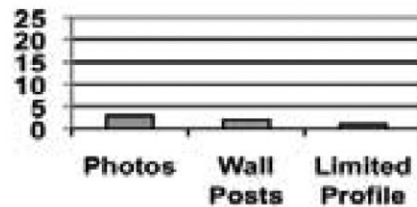
Privacy rule foundations created by the participants were perceived as the same. Participant felt his or her rules of privacy need not to be spoken, rather they were a nonverbal understanding. When information by the participants was published on their profile pages there was an expectation that friends would abide by certain rules. For instance one volunteer stated, "I don't care who sees my profile, I have nothing to hide. Everyone that is my friend, I would hope that they respect me and not use anything on my profile against me. That's not what friends on Facebook do. In the same respect, when I see Dr. Y's updated status or other information about her I do not use it against her. That would be like blackmailing." These comments point out that her expectations of others apply to her as well. There are no double standards as far as the participant saw it. Although in the classroom professors held a hierarchical status, outside the classroom there seemed to be no distinction of power. The only power that can be noted within Facebook is going back to CPM where all people own and control their personal information.

No I will not be Friends

The remaining section of participants (75%) presented a new concept which was that they would not self-disclose any information to professors because they would not be friends with them on Facebook. These individuals felt that maintaining a relationship outside of the classroom was inappropriate.

"No, I do not desire to be friends with any professor on facebook, I hardly even wanted to add my parents and have denied some aunts/ extended family. I feel that facebook is private and my professional/student life is no concern for my professor so I fail to see the point in it. We have several ways to communicate, e-mail, office hours, phone etc, Facebook is not needed," said one participant. From this perspective, maintaining a relationship on Facebook was inappropriate. This student perceived professors should not have access to any information other than educational matters. She clearly states what she considers to be appropriate means of communication. This student does not want to extend her relationship with her professor outside the classroom.

To prevent boundary turbulence the students used prevention as a method. Not being friends with a professor would prevent mistreatment of information from happening. Figure 2 demonstrates this relationship of prevention of boundary turbulence.

FIGURE 2. Stage One of Student's Willingness
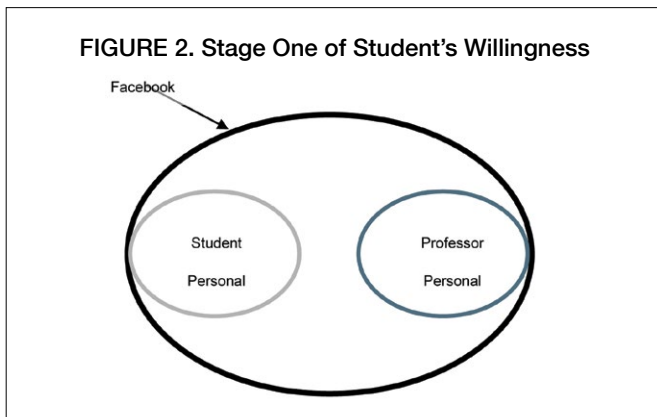
"I am not friends with any of my professors on Facebook. I chose not to because I feel that I want to keep my school life separate from my personal life. I don't want my professors to be looking at my profile and making assumptions about me, and possibly have those assumptions affect my grade," said another participant. She later contends in that same diary entry, "My Facebook is set to private…I didn't want possible employers, professors, or anyone I do not know checking my page." It is vital to focus in on the part where the participant connects assumptions by the professor and her grade. She felt that passed judgments from her professor could actually impact her performance in the classroom. To further safeguard her privacy this volunteer

has her profile set to private to keep invaders out. This privacy setting is where she places her boundary walls. Figure 2 represents this relationship as well.

"No, I would not want them to have access to any of my pictures. I don't like the fact that professors or anyone other than college kids can get on it. It use to be a way to keep up with college and high school friends only," stated one participant. This individual maintains the purpose of the original Facebook limitations in which only college students could be members. The student portrayed non-academia related members were violators that should be excluded from the community. He also specifically notes that his photographs are artifacts within this virtual community that he holds private. Later in his diary entries the participant also refers to privacy of his photographs but uses the term interchangeably with profile. In other words the student assumes his privacy rules for photographs to be the same for his whole profile.

"No I wouldn't consider having any professors as friends… It really depends on the professor because it's hard to allow them to see all your personal information," responded one volunteer. At first the participant is formative in not being friends with a professor on Facebook. Two days later her thoughts become a little more lenient and she is at least open to the idea. CPM in this scenario would look like two circles at first ten feet away from each other. As time passes, the circles come closer, kissing like magnets but not intersecting (i.e., see Figure 3).

FIGURE 3. Stage Two of Student's Willingness
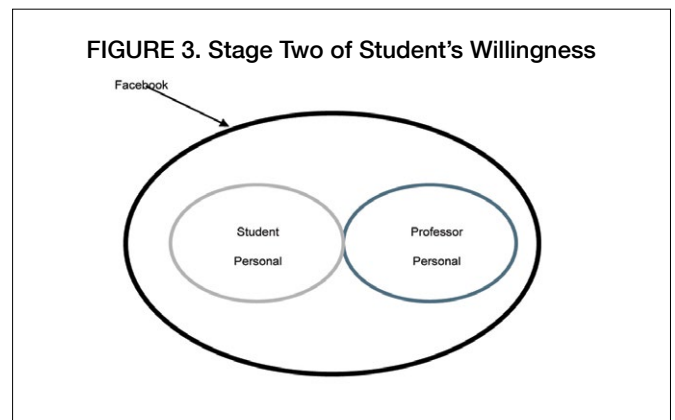
These unwilling participants brought insight to the current study. After reviewing the participants' response, it was conclusive that all individuals had clear bound-

ary lines of their privacy space. Some individuals felt safe and willing to be friends with their professors on Facebook (i.e., 25%). However the majority of the participant were not in favor of being friends with his or her professors on Facebook (i.e., 75%). The following section brought further discussion to the purpose and meaning behind the current paper.

Both student and professor personal boundaries are distant from one another. Co-owned information is non-existent and the willingness to be friends on Facebook is considered inappropriate, as shown in Figure 3.

Over the course of time the participant gained willingness of possibly extending her boundaries of privacy to her professors. Though the relationship was not established during the current study she noted the possibility for future reference.

As for participants who were friends with professors the diagram in Figure 4 demonstrates their boundaries:

FIGURE 4. Student Boundaries of Personal and Public Information
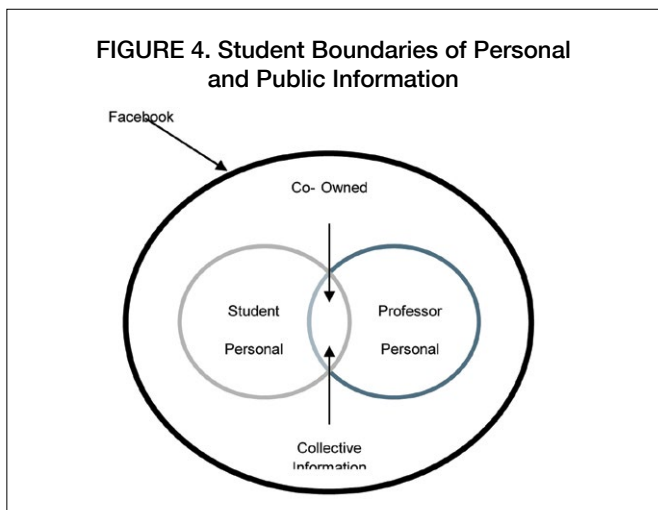
Information is shared and therefore co-owned which is shown above where the circles intersect. Remember that collective information is referred to basic information that is known to the general public such as one's first and last name, age, or sex, information that can be obtained through public records.

DISCUSSION

This study has brought new light to research on Facebook pertaining to student-professor relationships. Many students were unwilling to be friends with their professors on Facebook due to low levels of willingness to extend their self-disclosure boundaries. Those who

were friends with professors used mainly photographs, wall posts, and limited profile applications to alter their profiles. Most of these willing individuals said that they had nothing to hide, yet as later diary entries illustrate, they did alter their profiles. Some might view these actions as being inconsistent with how they feel. I however, maintain that these participants might have modified their profiles for personal purposes. For instance, what if a picture was posted of a student and he/she decided to delete it because of dissatisfaction with their self-image. This individual might not be concerned with how others perceive him/her, but make the changes based on personal reasons. These actions were then made for purposes other than concern for privacy matters.

In our society, we utilize these innovative mediums such as Facebook, but our personal privacy must be preserved and shared only when intended. CPM, as shown through the current study, helps us to better understand where we and others draw our boundaries of what is acceptable and what is not. As Facebook continues to prosper, so does our privacy.

Limitations of the current study include time restrictions, unequal proportion of gender representation in sample, and mean age of participants. Due to this project being part of a summer research program there was only three months of valuable time to conduct this study. Of the participants there were many more females than there were males that volunteered. The institution in which the study was conducted is considered a nontraditional university where most of the incoming freshmen are not 18 years old, but rather older people already in the workforce.

Throughout the process of the current study, I encountered many turns and came across new ideas. Aside from the proposed hypotheses, I questioned why do some students feel that being a friend on Facebook with a professor is so inappropriate? When the students and professors become co-owners of a student's self-disclosure, how is it reflected in the classroom? At what point do we approach vulnerability and find ourselves on the brink of boundary turbulence? In other online social networking sites such as Myspace, are the boundaries the same or do they change? All of these questions are possibilities for future research. Also, taking the current study and advancing it to a mixed methods technique is feasible for further research on Facebook.

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FIXING THE PIPELINE, IDENTIFYING THE GAPS: AN EXAMINATION OF HIGH SCHOOL AND COLLEGE FACULTY EXPECTATIONS

by TAYLOR FLOWERS

INTRODUCTION

Every year the projection rates of high school graduates from American public high schools increase. This increase has recently been associated with the achievement gap that is culminating as students complete secondary education and look elsewhere for either higher education or entrance into the workforce. The resounding reality is, however, that these students are not prepared for either arena. Post-secondary education is increasingly seeing that incoming freshman have not been equipped with the skills necessary to succeed at the collegiate level. Likewise, even research on the criteria for employers now view the once meaningful credentials of a diploma, inadequate.

An earlier study, done in the fall and spring academic year of 2008-2009, funded by The Title V Opening the Pipeline, Closing the Gaps Grant, sought to investigate entrance, retention, and completion of college programs. The research was completed on a focus group of high school seniors from four area high schools, first year college students attending Texas A&M University-Corpus Christi, and Upward Bound program students in Corpus Christi. Surveys were administered to determine standard classroom structure and practices, as well as high school experiences pertaining to education achievement in these students' high schools and core social science courses. With the completion of the analysis, a report was compiled for Title V accompanied by a wealth of information and recommendations.

In continuation of the previous project, this research seeks to explore the differences between high school faculty and university faculty expectations of student success in post secondary education. This research seeks to address the disconnect by identifying and comparing the expectations of each institution. Furthermore it will attempt to draw attention to the potential gap in efforts of curriculum alignment between secondary and post-secondary education.

REVIEW OF LITERATURE

As the achievement gap between secondary and post-secondary education expands, more attention is being directed toward national directives to preserve enrollment of incoming high school graduates. Retention is increasingly becoming a topic of national conversa-

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tion as higher education attempts to evaluate and reverse dropout rates for first year college students. Almost three-quarters of high school graduates go on to higher education, but according to the National Center for Education Services, "nearly half of all freshmen do not complete college and most of those drop out before their second year" (Haycock, 2001:8). With the reality of dropout rates, higher education must examine reasons for diminishing freshmen populations and how or whether retention is necessary. Many institutions are opening their doors to remedial education as a possibility (NCES, 2004).

The National Center for Education Statistics published a report entitled *The Condition of Education 2004*, in which Remedial Coursetaking, learning opportunities offered by higher education institutions for students who lack academic skills to succeed at the college level, is addressed. In the fall of 2000, approximately seventy-six percent of postsecondary institutions offered remedial courses and "twenty-eight percent of entering freshmen were enrolled in remedial coursework in reading, writing or mathematics" (NCES, 2004: 84). While this is consistent with data taken from 1995, the study shows that the average amount of time spent in these courses has increased from thirty-three percent to forty percent. Though public and private two or four year institutions accept these courses for credit on an institutional basis, colleges and universities are finding themselves having to make accommodations for academic inadequacy (NCES, 2004).

The realization is, now, more than ever, that "many students enter postsecondary education underprepared for college-level work," (NCES, 2004: 63) therefore causing "fewer than half of those coming in to never attain a degree. Many factors influence this attrition, but the greatest preparation students receive in high school has been found to be the greatest predictor of bachelors degree attainment" (The American Diploma Project, 2004: 3). Students with fundamental skills as well as rigorous curriculum expectations are better equipped for entering higher education (NCES, 2004 and APD, 2004).

That correlation beckons the question of what is causing the disconnect between high school graduation and college readiness? ACT's chief officer, and chairman of the board, Richard Ferguson, notes in the report, *Students Graduate from High School Ready or Not*, though the answer is multidimensional, "it has a lot to do with

students' high school courses not being sufficiently rigorous to prepare them for college work and that there are a number of students arriving in high school without the foundational skills to take challenging courses" (ACT, 2005: 3). In fact, in much of the United States, "students can earn a high school diploma without having demonstrated the achievement of common academic standards or the ability to apply their knowledge in practical ways" (APD, 2004: 1). The diploma is essentially no longer an indicator of graduates having the skills needed to compete beyond high school (ACT, 2005 and ADP, 2004).

The disconnect between high school faculty and college faculty perceptions of postsecondary education exists in the preparedness of students to meet academic expectations. In a study conducted by *The Chronicle of Higher Education*, when asked whether they understand very well what is required for students to succeed in college,

> *more than two-thirds of the teachers said they do, even though only eleven percent say that colleges are very successful in making academic expectations clear to them. An even lower proportion of faculty members, five percent, believe their institutions are very successful in making academic expectations clear to high school teachers. Consistent with that thirty-seven percent of faculty members say that public secondary schools fail to adequately convey to students what colleges expect of them academically, and sixty percent say schools convey that information only somewhat well. (Sanoff, 2006: 2)*

College instructors want more rigorous courses and higher expectations from high school. When asked about the students' abilities and attitudes in several specific areas, "faculty members say that students are inadequate writers, have trouble understanding difficult materials, fall short in knowledge of science and math, have poor study habits and lack of motivation" (Sanoff, 2006: 2). The ACT did a study to address the comparability of the levels of expectation represented by college and work for training readiness and found commonalities in reading and mathematics skills. Both viewed reading skill groups as identifying main ideas and supporting details, identification and application of sequential, comparative, and cause-effect relationships, the meaning of words, and finally, the ability to draw and apply generalizations and conclusions, as necessary skills for students to succeed. "First-year college stu-

dents who don't have adequate reading comprehension skills are likely to struggle in courses such as history, sociology, literature, business, and others that require extensive reading" (ACT, 2005: 2). Coinciding with this, research has found that in the area of mathematics, skill groups that proposed the most difficulty included basic computation and evaluation of algebra and algebraic thinking, geometry and geometric thinking, data representation and statistical thinking (Sanoff, 2006 and ACT, 2005).

The Chronicle study reported that thirty-six percent of high school students are either very or extremely well prepared for college level instruction. High school achievement could be enhanced if they focused more on "authentic pedagogy," which is defined as "instruction focused on active learning in real world contexts, calling for higher-order thinking, consideration of alternatives, extended writing, and an audience for student work" (Darling-Hammond, 2006:3). As high schools prepare students to suceed in the academic arena there are four key high school features that have a tremendous impact on college attendance to keep in mind: a college preparatory curriculum, a college culture that establishes high and informal communication networks that promote and support college expectation, a school staff that is collectively committed to students' college goals, and resources devoted to counseling and advising college-bound students (McDonough, 2004).

"Over all, both teachers and faculty members agree on an urgent need for better communication and greater interaction among high schools and colleges" (Sanoff, 2006). The consensus indicates that "we should be educating all high school students according to a common academic expectation that prepares them for both post-secondary education and the workforce" (ACT, 2006). "College classes tend to be competitive as opposed to collaborative in nature, and faculty tend to use lecture as opposed to active learning techniques," however "they must be willing to work synergetically with aligning courses with secondary education in order to maximize student achievement" (Hope, Rendon, 1996).

METHODOLOGY
Research Design

To research in more depth the differences between high school faculty and university faculty expectations, a series of interviews were conducted and recorded by prin-

cipal investigator, Isabel Araiza, PhD, and transcribed by myself and another research assistant. Participants of this study include: Texas A&M University-Corpus Christi faculty and Corpus Christi Independent School District faculty who teach Economics, Political Science, and History. Data collection began in March and ended in early June of 2009.

In the first phase, university faculty were interviewed as the focus group with attempts to identify expectations for knowledge and skill sets that are considered necessary for the success of incoming students. In the second phase high school faculty were interviewed about classroom structure, practices, and expectations for their individual classrooms. The third phase was an opportunity for faculty to be introduced to the previous study as well as the combined responses of university faculty. During this phase high school faculty were asked to discuss the challenges and opportunities concerning the desired skill sets of college faculty. The fourth phase of interviews were inclusive of the first two and additionally addressed the "college for all norm" and elaboration and clarification on responses from the preceeding sessions.

Procedure

The responses of all participants were reviewed and coded using qualitative analysis. Each interview was initially open-coded for broad general themes, then in the second pass, axial coding was used to find themes, and the third pass was done with selective coding, which looked for illustrations of themes. Inverse coding was incorporated as the interviews were analyzed.

FINDINGS
University Faculty

In general, the expectation of prior knowledge from university faculty was not significant when asked what content knowledge students should come into the course with. While their main focus is on content, they view a need for students to have good reading, writing, note taking, and study skills. Most all could agree on basic rudimentary information in each subject matter such as "how economic decisions are made" (Instructor 1, 78), or knowledge of "brief outlines of time periods" (Instructor 2, 86). There was a consensus that because high school instruction as it relates to content is am-

biguous, students come in with little to no knowledge, as one instructor put it:

> *My expectations of knowledge is extremely low because I don't, for a lot of students it's just simply not there. Uh, they just didn't, they don't have it. I'm sure they were exposed to it but they didn't retain it. (Instructor 4, 409)*

Five out of six instructors conveyed that there was a possibility of students possessing prior knowledge but that, even with best efforts, it has become necessary to provide instruction by, "starting at ground zero" (Instructor 2, 68). One professor does "assume that they know nothing" (Instructor 3, 186). All of the faculty held the notion that at some point incoming students had some kind of instruction, but the risk of withholding information was seen as greater than the risk of being redundant. Professors felt that because of the wide range of content, students should meet the expectation of reading in order to fill in missing knowledge.

Reading was not only expected, but also viewed by all participating university faculty as a necessary skill for incoming students' success in college. It is common for instructors to use reading in conjunction with notes, in-class and take home writing assignments, and especially to enhance and or fill in the links of lectures and discussion. Instructors see it as a way for students "to understand the material" and provide "a different perspective on things that help reading ability" (Instructor 5, 91). Assigned reading often acts as another medium for students to preview or review information outside of lecture. Depending on the instructor it may be that they "expect them to have read both chapters before they come into class," (Instructor 2, 44) or that assigned material should first be previewed as an introduction prior to class and then after lecture, be read for more in-depth understanding and reviewed.

While the necessity for reading was expressed clearly by all six university instructors, there were two out of the six that compromised the expectation with modifications for reading. Generally, this was done by acknowledging, that though reading is expected, students are simply not doing it. One professor says,

> *You want the student to read the stuff that you assign to them. That's… I think part of what college is about, you know. You're going to do some reading… Um, but I expect them to do the reading. And so, I put*

> *structures in place to try to manipulate them into doing that. Um, I'm not sure how successful that is, but see, this is why I changed like, from reading responses to a quiz system on the reading. (Instructor 6, 212)*

Several instructors are either placing less emphasis on reading roles within the course to being resourceful in compelling students to fulfill this necessary expectation. This comment shows how professors have to adjust classroom practices and structures to ensure that students are reading assigned material. Instructors use reading as a means of instruction and in many cases evaluate student perceptions and comprehension of general topics through writing.

Writing is seen by many professors as a fundamental skill that is generally required for success in a college level course. The demand for writing extends across all subject areas and is used for various purposes in post-secondary education. Writing is a tool professors use to have tangible proof of learning. "I feel you don't know you know something until you write it," says an instructor who uses writing as an evaluative tool (Instructor 1, 110). The demand on writing ranges in complexity among this group of professors, with one not requiring writing at all outside of note-taking. Necessary writing capacities include: "to get their ideas across" (Instructor 2, 92), "to summarize a news article and then a paragraph to analyze it" (Instructor 5, 101), or simply "as a way to demonstrate learning outside of or thinking outside of formal testing environment" (Instructor 4, 373). In most cases discrepancies over writing did not exist because of grammar, organization, or usage of conventions, but rather for lack of, as one professor puts it,

> *Um, detail. Um, following instructions. Just basic stuff. Here's the question, um, write your answer in response to the question. Structure it around the question. Um, they either will leave off huge chunks of it, you know, if the question has multiple parts, they won't answer certain parts. Um, or they won't really answer the question at all. Um, they don't include much detail, very vague…You know, I try to teach them that you need to give specific examples as much as you can (Instructor 6, 176).*

Writing is most commonly showing up in exams through identification terms (ID), requiring students to tell, who, what, when, where, and significance, along with short answers, and essays. Short answer and essay

questions are meant to implore students to apply and express written thoughts and answer a question thoroughly. Several professors give students essay questions beforehand with the hope of increased thought and application within the exam. Another expectation of writing is the form of short papers ranging from two to five pages. Instructors are increasingly trying to develop writing skills that will help students be successful at the collegiate level. Being able to express in writing perspectives or content knowledge, also fell short, many professors believe, because of lack of practice with necessary skill sets.

Participants were emphatic about skill sets incoming students need (and are seemingly missing) in order to thrive in core social science courses. In years past, professors noticed that student's abilities to take notes and use successful study strategies have diminished dramatically. Critical thinking and time management skills were also recurring coded themes instructors felt would augment student success. As this has become an alarming phenomena, many of the professors have begun to construct entrance and exit surveys, or they document changes in student skills.

Because lecture is the most widely used method of instruction in the university setting, it is important that students be engaged and avid notetakers. All six professors responded that notetaking, though not required, is necessary to succeed in their courses. When asked, when they come into class, what is your expectation of students during that class, respondents most often answered, "I expect them to listen. I expect them to take notes" (Instructor 3, 32). Not only are students expected to take notes during discussion, but they are expected "to do writing with their reading, so that they're taking notes" (Instructor 2, 70). Many instructors have explained in class the importance and process of taking adequate notes. Notetaking was noted by one professor as one of the biggest challenges students face:

I tell them again and again, I say, I give the Power-Points and the PowerPoint has a little picture on each slide and a couple of bullets on it; and I say, this is just an outline… Um, it's not a substitute for your notes. If you just write down what's on the slide, you are not going to be ready for the test. You are not going to be able to fill out the study guides because it's not enough information. And I tell them you need to try, write down as far as possible, everything I say in the

next fifty minutes unless I tell you not to. Write down everything. (Instructor 6, 172)

Also among the suggested skill sets were successful study skills. According to one professor,

Successful study strategies would be, to really try to look at the basic ideas from reading and try to aggregate them to see what's going on in the whole to get the bigger picture… what it comes down to on a real functional basis is uh, can you come to class, memorize these facts about different aspects…and regurgitate it back to me. (Instructor 4, 271).

Instructors note that students may not need to have good time management skills, or complex critical thinking skills, but instead must read, take notes, attend lecture, and be able to express comprehension in written form.

University faculty would expect that students graduating from high school and entering college are at least minimally equipped with the skills and content needed to function and persevere in higher education. However, they are finding that students are coming in with seemingly no prior knowledge of content, and lacking either the motivation or ability to read, write, and apply skills to be successful. By eliciting the high school instructor's perspective, combined knowledge of the two expectations to succeed in post secondary education can be derived.

High School Faculty

While content links college and high school social science courses, the focuses and the expectations of the teachers were shown to differ in several aspects. High school instructors were more concerned with citizenship, real application of knowledge, instilling values, and developing interpersonal relationships, as well as content. The wide range of focuses, however, does attempt to allow students to take away broad conceptions of content matter rather than specific information.

Each teacher placed emphasis on providing students with the content of their respective subjects. Though the focus of each objective differed, as well as the range of complexity and depth taught by each instructor, there was a sense of generally wanting students to possess basic knowledge of each subject area. Participants avoided becoming too specific with instruction and encouraged "understanding concepts more so than

anything else" (Instructor 10, 1st interview, 115). One instructor remarked:

> I like them to know characteristics of different periods… What was happening during different periods, stuff like that. You know, because if you know the time periods and era and the characteristics of it, you could know what's going on. You could also relate it to what's happening today and different things like that (Instructor 9, 2nd Interview, 282).

This comment illustrates the teacher's hope that students will use familiar context information to disseminate what happened in a time period and how it relates today. Centering instruction on general information for students to retain was anticipated to increase the understanding of "the world they live in, the country they live in, how we got where we are and why things are the way they are" (Instructor 8, 1st interview, 484). By combining the content with these understandings, it was expected that students would think more about circumstances and become active citizens with desired values.

Citizenship was also a common theme in the responses of instructors. Preparing high school students, who will eventually, or have already, reached the age of adulthood after graduating, was an objective outcome for most of the teachers. As student's engaged with government, economics, and history it became necessary for them to be fluent with the systems, as put by one instructor, "so that you can activate your voice within the framework. And if you don't like our framework, you know how to change it" (Instructor 7, 1st Interview, 211). With this understanding, the goal is to ensure "that they're productive and they prosper, they gain knowledge and will be able to function as a citizen" (Instructor 9, 2nd interview, 34). Many of the student populations that participants worked with required teachers to build a relationship and "get the kids interested in doing well" (Instructor 8, 1st interview, 357).

Two out of the four high school faculty found that it was a necessary goal to "become personal with the kids" (Instructor 9, 2nd interview, 312). One instructor expressed the importance of building trust with students as a way to spark interest and get student participation:

> Interpersonal connections. Um, when you work with at-risk students uh, the biggest thing in being their teacher is trust. Why should I trust what you are say-

> ing, why should I trust your intentions. It's trust. How, how do I gain one hundred to two hundred students' trust? And I have to get it before the first semester… I have to get it those first two days of class or else they're not going to do anything for me. (Instructor 7, 1st interview, 241)

For many high school instructors this is true and can pose a problem within the class. This particular teacher overcomes this by assigning students to do a personal mission statement, which gives the teacher background information that cannot be discerned from TAKS scores, and creates a relationship between the teacher as well as fellow classmates.

Whether the expectation before completing the course was content, citizenship, or interpersonal connections, all of the high school teachers agreed that application of knowledge was an important quality of instruction, especially because it acts as a means to get information across to students. Put simply, one teacher explained that the homework turn in rate was somewhat improving because "you have to make it where it applies to me. Because if it doesn't apply to me, why do I care, you're wasting my time" (Instructor 7, Interview 1, 81). Other instructors not only incorporated practical application of taught concepts to homework, but also through class lecture, notes, classroom activities, and writing assignments. Instructors set up opportunities for students to participate in the election process, and used economic journals, competitions, and simulations or culminating projects to enhance students' engagement with the content. In an economics class students were routinely expected to use learned material to "read the stock pages… check prices. They'll do an analysis at the end" (Instructor 10, 122). By incorporating projects with the knowledge, students were able to remain engaged and will keep many of the experiences.

Results from the interviews confirm that all participants view certain skill sets as necessary for success in and beyond high school, but unfortunately, many students are lacking. Of major concern were reading, writing, and taking notes. High school teachers have seen these skills be reduced by interfering legislation, effects of technology, and a new student dynamic. Though faculty have recognized the devolution, the question of whether to reinforce, re-teach, or modify is based on the individual teacher.

Reading has become more of a hassle than a required skill. High school instructors have to make adjustments for lack of textbooks and time though modifying reading aspects within the courses. Two out of four instructors make modifications or do not place emphasis on reading both in and out of the classroom, while the remaining two mandate it. When asked, how often do you assign outside reading, one instructor answered "Very rarely. Every once in a while, it'll be inside reading where we bring in a newspaper" (Instructor 9, 1st Interview, 154). Where reading is not a must, one instructor chose to modify journal or newspaper articles as "outside reading, they're allowed to do it in class" (Instructor 7, 1st interview, 42). In this specific case, making a modification as such was in response to resistance to reading. This is an example of a modification many teachers have to make, rather than do no reading at all, and is similar to guided reading, which is also used to compel students to read. On the other hand, some participating teachers made reading necessary in order to pass the class. One instructor commented, "I think that when you give a textbook, and they don't know how to read for information, they're overwhelmed" (Instructor 10, 3rd Interview, 91). Even so, the teacher gives students reading assignments and pushes them to use tools to help break the information down. Without these skills and the effort to read, students will not be able to pass. The latter two instructors stress reading as a priority in class with accompanying quizzes to check for understanding as well as lecture and discussion topics.

Writing was another subsequent skill that students exhibit less of. All instructors found themselves focusing on the ideas, more so than the organization, grammar, and critical aspects of students' writings. The common observation was that students do not and many cannot write very well and therefore have trouble expressing and conveying a written message when given a topic. While most felt that writing was "a life skill" as put by Instructor 10, incorporating it into the classroom is no easy task, but still necessary to develop. Instructors that do require writing found that grading had to be lenient. For instance:

> But when I grade, I have to grade for content… I have to make myself remember that I'm looking for facts, you know, I'm looking for ideas and not the way they write. But it's hard because some of them really do not write well. (Instructor 8, 2nd interview, 999)

In part this perspective comes from encouraging students to write and feel comfortable in turning in their writing, and from students no longer having formal grammar instruction incorporated into high school. For one instructor it was expected that "extended writing" should be saved for English courses "because in English, they scope and sequence for those things like that" (Instructor 9, 1st interview, 380). Writing assignments vary in length, depth, and purpose depending on the teacher. Writing was intertwined in journals, competition papers, summary and analytical papers as well being used as a means to check for understanding.

Notetaking in high school is facilitated by the teacher. The response from participants was half and half. Two teachers required and expected students to actively take notes from lecture. These two instructors took the time at the beginning of the year to teach the Cornell Notes method:

> Now they know a lot better, now, at the end of the year. But in the beginning, even my brightest kids, they weren't sure. You know, they try to write everything and then they want you to stop and repeat it and I say you can't do that. You write down just as fast as you can, and you may not be able to get it all. (Instructor 10, 2nd interview, 1537)

Instructors observed that taking time out to teach the method was needed because students do not know how to take notes and therefore either do not take notes, or try to write everything and end up missing the point of the lecture. The teachers who did not require notes prepared handouts with notes for students.

Disconnect Between High School and University Faculty

An in-depth look at the perceptions of readiness from post-secondary and secondary instructors for students illustrates clearly that students have not received the skills needed to persist through higher education. As instructors of both institutions modify to meet the needs of students the rigor of the curriculum of each is dissolving.

In addressing the disconnect between high school faculty and university faculty expectations there are several variables, perspectives, and directives to consider. The main themes demonstrated by this study can be categorized into student-teacher roles, mandated initiatives, and skill set development. Each theme has various at-

tributes that affect the disconnect experienced between secondary and postsecondary education.

Students play a big role in the disconnect that continuously develops between the two institutions of education. They have their own expectations for college and are equipped with experiences prior to college entrance. It was perceived by both high school faculty and university faculty that students "have unrealistic expectations of what they expect to do in college" (Instructor 6, 413). Similarly, high school faculty suspects that students "don't have high expectations of the effort that they will have to put in (Instructor 10, 2nd Interview, 446). Furthermore, one attributes this to a growing student mentality that "with instant gratification we've taught kids that there's no work and preparation that goes into getting what it is that you are striving for" (Instructor 10, 2nd interview, 388). This characterizes many students; however it is also a growing epidemic that students are facing more than ever and has an effect on educational outlook.

> *I'm just surprised that many of our students are functioning all the way up to their senior level year with some of the things they're facing at home. The only reason I get to find out these things is because of that assignment and so if they're never or rarely doing their homework at home, if you read the personal mission statements, I could actually understand why. Because if I'm going to work, or if I'm, if I have a drug addiction, drug abuse, uh, physical abuse, mental abuse, uh, I'm being kicked out of my home… I mean you'd like to think that those things are a rarity, but if you read and you take just a sampling of just the mission statements, it's starting to become a, uh, pretty common occurrence. (Instructor 7, 2nd interview, 51)*

There is a twisted dynamic of how students are coming into and prepared to function at the university level after high school and what they may expect to do. With either perspective, instructors from either level of education seek for students to be held accountable and to come in with a desire to learn. One instructor remarks that students should "have the right attitude, be curious, want to learn" (Instructor 7, 2nd interview, 123) with all the variety of courses offered, while another professor just wishes students would come to class with a "positive attitude" (Instructor 5, 81). On the other hand, attitude toward learning is valid but should also be accompanied by student accountability. According

to a professor, it is perceived that "students are not held accountable in high school. And that's something that one teacher can't fix. It would have to become a systematic thing in a school" (Instructor 1, 100). High school faculty participants definitely agree with the need for systematic changes in schools to hold students accountable, but many demand accountability within their own classroom via graduation contracts, policies on late work, and overall, demanding more from students.

Also constantly changing in the high school arena is the teacher role as well as teachers have become more and more responsible for what goes on within the school. A high school teacher reflected:

> *And I don't know how much more the school system is going to be able to take if society as a whole is not addressing some of the issues that teachers have to. You know the teacher has to be mother, father, sister, brother, counselor, in class because of the things going on outside of class. So that, I think, might even be, even bigger than just a problem with the school, the school district. I think that it might be a function of what's going on in the reality of our student's lives. (Instructor 7, 2nd interview, 51)*

As teachers juggle their many hats, some also view a different role for college professors with their involvement in student education. One high school instructor explains that a secondary teacher wants to make sure "they get it," which may entail letting them start in class and checking for understanding, whereas in college the student is trying "to get an education" and learning is more the student's responsibility and therefore unlike high school, where it is viewed as the teacher's duty to give an education (Instructor 4, 2nd interview, 9-10). Instructors also observed from a financial point of view that students going into college are investing in education; whereas in high school they have to attend. This gives college the opportunity of saying "If you can't pass this course pay me again" (Instructor 8, 2nd interview, 729).

Another recurring theme related to the disconnect is that much of what happens at the high school level is mandated, in contrast to the autonomy students are given at the college level. Both professors and high school teachers agree that this largely affects students coming into higher education. One instructor commented on his high school bureaucracy:

Systems are set up to get the results they get. If you want different results, don't blame the students; don't blame the faculty. Blame the way you set up the system. (Instructor 1, 200)

High school teachers do have some control over what goes on within classrooms but administration and legislation are increasingly becoming negative interferences and hinder instruction. Most college environments have autonomy over principles for teachers, students, and instruction, which is a different dynamic from high school.

High school instructors noted that administration and legislation have especially taken a role in textbook distribution and homework assignments. Textbooks are a big problem for high school teachers. Unlike for college professors who noted collaboration among teaching staff to choose a textbook, textbooks at the secondary level are not chosen by the teacher but by the district or state. On the matter of textbooks, an instructor uses outside sources because "our textbook is seven or eight years off what our current system is…" (Instructor 7, 2nd interview, 61). For this same reason, Instructor 9 refers to the textbook as a reference. Another high school teacher remarked:

I honestly think for many of the teachers, the textbook is, and this is going to be sad to say, out the window because one, students aren't reading it; and two, the teachers are now responsible for the students turning in their textbooks. Why do I want the additional burden of being responsible for a student turning in their textbook? (Instructor 7, 2nd Interview, 63)

All of the participating high school instructors in some way mentioned some disagreement that teachers should be responsible for textbooks. This affects the budget they have to spend for classroom supplies and adds on to school deficits.

Many of the questions high school teachers were asked pertained to independent learning. The textbook ordeal is a leading impact on the lack of reading, since students cannot or are not allowed to take the books home; however, homework is also now mandated by the district. One instructor explained that "a lot of districts mandate that the homework can't count for anything. There's no grade attached to it. And so a lot of kids won't do it if there's no, they don't see a reason for it" (Instructor 10, 2nd interview, 139). Though teachers

may assign homework, the turn-in rate remains low for this reason. Another high school instructor expressed his disappointment on the subject:

And I just learned over the last couple of years that there are a lot of regular teachers who have given up on giving homework because kids don't do it. And to me that's not a good reason not to give it. You know that's a matter of um, it that's what you expect, well then that's what you're gonna get… (Instructor 8, 3rd interview, 10)

Homework is encouraged to be small assignments that do not require strenuous work.

Administration for high school teachers also affects the amount of time available for instruction during class. The loss of class time due to things outside the classroom was a major detriment according to two out of the four teachers, and agreed upon by all. High school teachers were avid about the amount of time lost "for things that are just not necessary" (Instructor 8, 1st interview, 498). This includes whole days for TAKS benchmark testing, movie days after TAKS, two days to register for AP exams and so on. Not only do teachers feel this is a waste of time but also that it impedes their job and student learning. According to Instructor 9, "In my opinion, it doesn't allow you to teach history. It allows you to memorize dates and stuff like that" (Instructor 9, 2nd interview, 92).

A college professor recapped some thoughts about what has happened to the students' skills in the classroom:

What happened to students? And I think this is a result of the TAKS. I seriously do. That these kids have been tested and tested and tested and this is probably one of the first cohorts that came out with being, that went through the whole uh, standardized testing… Yeah, because look, that No Child Left Behind Act. George Bush went up there in um, 2000. In 2000 and these kids, if they're eighteen now, so yeah, they were, so they probably went through the whole thing. (Instructor 3, 242-244)

They would have been nine, third graders? (Interviewer, 245).

And that's when they start testing. (Instructor 3, 246).

This thought provides the basis of what Instructor 9 was saying about TAKS being indicative of current min-

imal students skills. Teaching actual content is viewed as conflicting, in that high stakes testing not only takes time from classroom instruction but also requires students to be efficient at taking the test rather than knowledgeable of content. However, it is the basic knowledge of content area and the combination of skill sets that are necessary for students to be equipped for the successful completion of post secondary education.

Outside of TAKS, testing administration also takes precedence in attendance and in the pass and fail rates of high school teachers. When one instructor was asked what would allow the instructor to do a better job of doing what the instructor is really trying to do, the teacher replied:

> If I could get… more administrative support. And I'm not talking about administrative support to let me do these projects because they let me do the projects I want. The administrative support that comes with, I know this student has missed thirty days of class, find a way to pass him. (Instructor 7, 1st Interview, 243)

According to high school teachers, this is only one of many examples of what administration uses to pass students along. Students have the opportunity for remediation, participation in intercession, and summer school if they are on the verge of failing. Not allowing students who deserve to be failed to receive a failing grade showed up as one of the biggest problems for all four high school teachers. Remediation for students is a way for students who are far behind in course work to catch up. Intercession is a form of remediation.

> Intercession is where you turn in um, a packet to the intercession coordinator, whoever winds up doing it. The coordinator sits down, hands out [the packets], you're here for math… here's math, there's the packet. Do the packet, turn it in, give the packet back to the teacher, teacher grades it, and that will decide whether or not you get the extra points you need to pass the class. (Instructor 7, 302)

As intercession and remediation are a growing culture in high schools, teachers observe that students are no longer worried about failing because of all the opportunities to make-up for lost time. One instructor remarked, "and they didn't seem to care if they fail because they'll go to summer school and they'll take it and get their credit" (Instructor 8, 3rd interview). Teachers saw this as producing students who should have failed getting by with intercession and remediation opportunities without completing proper work.

DISCUSSION

Both high school and university faculty's perceptions on what is expected from students were more or less congruent. High school faculty tended to focus more on content and the implications of curriculum on the individual student (citizenship, productivity, values) than on preserving and cultivating skills for successful post secondary education. However, there were efforts to use skills such as reading, writing, and critical thinking within teaching content. University faculty also tended to focus more on content of respective subjects. However, the insufficiency of these skills eventually hinders instruction, which can be said for many high school classes.

In both levels of education instructors are finding that the inadequacy of basic reading, writing, note taking, and critical thinking skills makes teaching content at a rigorous level difficult. In either case, instructors have to adjust to fit students' needs while demanding students take more of an active role in their own education.

As high school faculty get more information on what it is that college professors expect and the shortcomings of first-year students, there was discussion about how to modify high school instruction. The disconnect is most evident in high school teachers' efforts to align with university faculty. While the need and will is there, both institutions are looking for ways to vertically team, and therefore collaborate to get students prepared to enter college. Many of the obstacles are a product of the high school environment where remediation and inadequacy have become a mentality instilled in the students. All participants expressed willingness to use the expectations from both groups to correct and build the skills sets needed, while lowering the need for remediation and retention.

Implications

While both institutions doubted the other as far as what was going on inside the classroom of each, findings do show that in some cases instruction was different and in others the high school courses were modeled after a college course. Though the expectations differed some-

what, the goals and needs of both high school and university faculty are very similar.

Consequences of this disconnect are not only affecting the rates of retention for college entry but also the preparation of students that will be the workforce and leaders of tomorrow. With a system set up for inadequacy and remediation, students will not be educated at a level to excel after completing high school. If the gap persists, curricular content at the college level will be forced to become more skill based and continue to reproduce inadequate students.

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THE EFFECT OF RELATIONSHIP DURATION ON MAINTENANCE EXPECTATIONS

by CHENIKA FOWLER

ABSTRACT

A rather depressing statistic in the realm of relationship science is the finding that marital satisfaction decreases over the duration of a marriage (Kurdek, 1999). Caughlin & Huston (2006) have suggested that dramatic changes in one's expectations for marriage (disillusionment) may be a major factor of such decreased satisfaction. The goal of the present study was to explore people's expectations for how much maintenance is required to maintain a successful relationship. Participants were asked to evaluate a set of relational maintenance strategies as they applied to a successful premarital relationship, a 1 year marriage, and a 10 year marriage. It was predicted that people would expect to work less at a relationship that had lasted a long time and that men would have lower expectations than women. The results of this study suggest that younger participants expected to work less hard at marriage than older participants.

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Consistent with our hypotheses, men (especially young men) expected to work less hard at maintaining marriage. Interestingly, men indicated a marriage needed to last 16 years in order to be labeled "successful," whereas women reported only a 10 year requirement.

INTRODUCTION

Divorce has become commonplace in America. Since the 60's, when only 1.8 percent of men and 2.6 percent of women were single and divorced, percentages have quadrupled to 8.3 percent and 10.9 percent (Popenoe & Whitehead, 2007). Divorce rates in the United States tend to be two times as high as in Canada and ten times larger than the rates in Mexico (United Nations, 1999). So why do couples have such a problem staying together? Some have suggested that many couples simply do not put in the effort needed to maintain a successful relationship (Miller, 2001). Is this due to fatigue of dealing with partners? Or is such lack of effort related to people's general attitudes about the amount of effort they need to put into a relationship over time? A main goal of the present study was to explore people's expectations for relationship maintenance behavior over time.

A rather depressing statistic in the realm of relationship science is the finding that marital satisfaction decreases over the duration of a marriage (Kurdek, 1999). In perhaps the most extensive investigation on martial rela-

tionships, Huston and his colleagues followed 168 couples who married in 1981 (Caughlin & Huston, 2006), as part of the Process of Adaption in Intimate Relations (or PAIR) project, which showed that only 45% of the couples reported being happy with their marriages after 13 years and those couples reported being less satisfied and less loving than when they got married. Huston concluded that the process of disillusionment follows a process in which marriages begin well with romanticized beliefs for a relationship that are idealistically positive but turn sour when the spouses stop working as hard as they had before to be lovable and appealing to each other. For some couples, romance tends to fade and frustrations tends to occur more often, which causes some couples to realize that partnership is less wonderful than they expected (Kayser & Rao, 2006). Some couples became disillusioned with their spouse and marriage even right after they get their marriage license signed. One factor shown throughout this project is how couples' satisfaction and love tend to fade over time when they go into a relationship with high expectations and no strategies.

Perhaps one explanation for the decrease in satisfaction over the course of a relationship may have something to do with the effort spouses expect to put into their relationship. Research has demonstrated that as time goes by, our expectations for relationships increase (Amato & Hohmann-Marriott, 2007). In addition, our expectations have increased due to an increase in the standard of living (Myers, 2000). It has been suggested that one reason couples may see such a decrease in relational expectations is that they put forth less effort in their relationship over time (Miller, 2001). The present project attempts to assess people's expectations regarding the amount of effort they believe is needed to sustain a healthy interpersonal relationship. Specifically, we are interested in whether such expectations vary between relationships of different durations. It may be the case that we expect to exert less effort in relationships that last a long time. If this is true, relationships may be inherently doomed because we want more but expect to put in less.

Canary and Stafford (2001) have worked to identify different relational maintenance strategies that are associated with successful relationships, strategies such as making sacrifices, being forgiving, communicating feel-

ings, and sharing tasks with spouses, which are played out differently in the context of different relationships. Canary and Stafford identified seven key strategies for maintaining successful relationships. The first strategy is positivity, wherein satisfied partners try to promote positivity by being gracious, staying happy, and remaining cheerful. The second strategy is openness wherein contented partners try to persuade openness, and self-disclosure by sharing their individual thoughts and beliefs as they attempt to encourage their partners to do the same. In the third strategy couples supply assurances in order to reveal their love, commitment, and respect for each other. The next two strategies, social networking and sharing tasks, relate because couples share a social network by maintaining common associates and spending time with their partner's family, while they share tasks around the house in a reasonable manner, such as managing a reasonable share of the household responsibilities. Finally, the last two strategies, support and humor, occur when satisfied partners try to provide support to each other in order to sustain an atmosphere of good humor and try to spend plenty of time together, along with apologizing when they are in the wrong.

The purpose of the present project was to explore people's expectations for how much maintenance is required to maintain a successful relationship. It was predicted that people would have lower expectations for relationships of longer duration.

METHOD

Participants

Participants for this study were all undergraduate students enrolled at Texas A&M University-Corpus Christi. A total of 104 students (27 male and 77 female) participated voluntarily at either the end of one of their classes or during their free time. The sample consisted of 4 Asians, 7 African Americans, 44 Caucasians, and 49 Hispanics. All participants ranged between the ages of 18-57 years with the average participant being 23 years of age.

Measures

Relationship Self-Esteem and Satisfaction: Relationship Self-Esteem and Satisfaction were assessed using subscales of The Multidimensional Relationship Question-

naire (Snell, Schicke, & Arbeiter, 1997). Participants were asked to think about previous relationships that they had been in and answer on a 5 point scale how much self-esteem they had or how confident they were in their previous relationships. The Relationship Self-Esteem Scale consisted of 5 questions assessing to which individuals felt good or confident about their roles in a relationship. The Relationship Satisfaction Scale consisted of 5 questions assessing the extent to how happy or satisfied individuals were with their relationships.

Relational Maintenance: Relational maintenance is another word for relationship maintenance mechanisms, tactics or tactical actions that people take and abide by to sustain their relationships. A 20-item measure of relational maintenance was used for the present study. These 20 items were adapted from Canary and Stafford (1992; 2001), Stafford (2003), and Kift (2009). The measure consisted of 16 subscales which included supporting your partner, managing conflict, being positive, providing relationship assurances, sharing tasks, sharing routine activities, having a strong friendship, visualizing a future, having humor in your relationship, communicating, experiencing topic avoidance, negotiating sexual needs, being affectionate, avoiding negativity, practicing fidelity, and having mutual friends.

Procedure and Experimental Manipulation

After completing a consent form to participate in a study about "maintenance strategies in a relationship," participants were furnished with a questionnaire, and it was explained to them that this study was being used to gather information to see what is needed in order to maintain a successful relationship. The participants were informed that some of them had a different format or layout for the questions, but that they all had the same questions. For example, some had to answer the questionnaire by telling how they felt about a one year premarital relationship first, how they felt about a one year marriage second, and how they felt about a ten year marriage last, while others maybe had to answer a questionnaire telling how they felt about a ten year marriage first, a one year premarital relationship second, and a one year marriage last. They were instructed that the questionnaire should not take any longer than 30 minutes to complete and that it would really be appreciated if they completed all the questions honestly. Before letting the participants start the questionnaire they were told that if they had any questions, they should

not hesitate to ask. After about 30 minutes the participants started to hand in thier completed questionnaires while receiving a polite thank you for volunteering and for answering the questionnaire.

RESULTS

A reliability analysis revealed that both the relational self-esteem (Cronbach's alpha = .89) and relational satisfaction (Cronbach's alpha = .921) measures were internally consistent. As can be seen in Table 1, relational self-esteem was found to be positively correlated with satisfaction and maintenance expectations for the pre-marital relationship and 1 year marriage. Relationship satisfaction was positively correlated with maintenance expectations for all relationships. Male participants indicated that they had a higher number of relationships (M = 3.04) in the last 5 years than female participants (M = 2.07), $t(101) = 2.6$, $p = .011$. Females, however, indicated that they had experienced longer lasting relationships (M = 1.9 years) on average than males (M 1.1 years), $t(100) = 2.6$, p = .022. In regards to the question asking participants to define "success" in a relationship, males thought marriage must last longer (M = 16 years) to be considered successful than females did (M = 10 years), t (86) = 2.3, $p = .033$.

Participant ratings for the 16 maintenance strategies were averaged together to form an overall measure of maintenance expectations. In addition, a median split was performed on participant age that divided participants into over 21 and 21 and under age groups. Maintenance expectation scores were then analyzed using a 2 (Sex: Male, Female) X 2 (Age group: 21 and under, over 21) X 3 (Duration, premarital, 1 year marriage, 10 year marriage) mixed ANOVA with the last factor serving as a repeated measures factor. This analysis yielded a marginal interaction effect between duration and gender, $F(2, 200) = 2.57$, $p = .08$. As can be seen in Figure 1, male participants expected less effort for a 10 year marriage than female participants expected. A main effect for relationship duration was also found, $F(2, 200) = 8.61$, $p < .001$. Expectations for maintenance were lowest for pre-marital relationships (M = 4.05), highest for 1 year marriages (M = 4.20), and in between for the 10 year marriage (M = 4.14).

TABLE 1. Intercorrelations between Relationship Esteem, Relationship Satisfaction, and Maintenance Expectations for Relationships

	Relationship Esteem	Relationship Satisfaction	Premarital Relationship	1 year
Marriage Relationship Satisfaction	.718**			
Premarital	.218*	.310**		
1 yr. Marriage	.237*	.242*	.763**	
10 yr. Marriage .793**	.163	.200*	.734**	

* Correlation is significant at p<0.05
** Correlation is significant at p<0.01

FIGURE 1. Average Maintenance Expectations by Gender and Duration
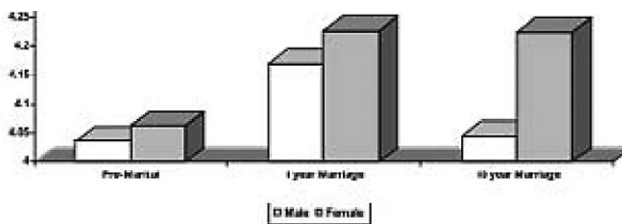
DISCUSSION

Although evidence is mixed, expectations for maintenance appear to vary as a function of duration. Specifically, the results suggest that young people (especially males) generally have expectations that the longer a marriage lasts, the less work they have to put in to maintain it. As such, the present results add to the body of literature investigating relationship satisfaction over the course of marriages. Also, the present results suggest that expectations for relational maintenance may contribute to lower satisfaction over the long haul. As suggested in previous research, people's expectations for what they deserve in a relationship may increase over time (Amato & Hohmann-Marriott, 2007). In addition, other research has suggested that the problems people face in marriage are more pronounced as time goes by (Caughlin & Huston, 2006). If people's expectations for the amount of effort needed to maintain a relationship decrease with time, decreased satisfaction is likely the result. In explaining decreases in marital satisfaction over time, future research might further explore the link between such decreased expectations as an element in disillusionment.

Participant ratings of their own relationship satisfaction and esteem were found to predict maintenance expectations in the present study. Thus there is evidence that people's relationship histories may play an important role in determining maintenance expectations. Specifically, people who score higher on relationship esteem and satisfaction indicated that they also had higher expectations for maintenance in relationships. This suggests that success in early relationships (since most participants had never been married) may be related to marital success.

Perhaps one of the most interesting results of the present study pertains to the gender differences related to expectations. It turns out that a male's maintenance expectations for a marriage increased just as much as a female's when it came to the first year of marriage but decreased for the ten year marriage more than that of females. This implies that males may expect to work less hard at maintaining a relationship as time goes by. This idea is consistent with the work of other relationship researchers (Gottman, 1994b; Miller, 2001). For example, Gottman (1993) has suggested that a male tends to avoid conflict because he feels that it can be resolved by either waiting it out or leaving it alone, while a female views conflict differently. Gottman (1994b) also suggests that a man should not avoid conflict if he wants his marriage to work because conflict transports problematic concerns and incompatibilities out into the open so solutions can be figured out. It may be hard for a male to see things this way since males, in general, have been suggested to be less sensitive to relationship issues as compared to females (Miller & Perlman, 2009). On another note, males in the present study reported that a marriage would need to last 16 years in order for it to be considered successful as opposed to females who suggested 10 years. This may also explain why men do not tend to expect too much, or put too much into a relationship. It should be noted, however, that the gender effects found in the present study were based on a rather small male sample (N = 27). Future research might explore the gender differences suggested in this study.

This all leads to the conclusion that the length of a relationship has an effect on partners' expectations for relationship maintenance. It shows that couples expect to put less work into maintaining their relationship the longer they are together. On the positive side, divorce statistics may be improved by changing attitudes people have for relationship maintenance. If people expect to work harder to maintain a relationship, behavior may follow leading to much greater outcomes and satisfaction. Since our world is built on a work ethic, where we tend to work harder for something we want or something we can be rewarded for, maybe it would be better for everyone to view marriage as a career in which hard work serves as the key to success.

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BATTLE OF SOUTH TEXAS: ETHNIC IDENTITY AND FIRST-YEAR EXPERIENCE

by MAYRA P. GARCIA

ABSTRACT

Ethnic identity and first-year experience were measured between Hispanic students in two universities from South Texas: Texas A&M University-Corpus Christi (TAMU-CC) and the University of Texas at Brownsville (UTB). Students were assessed using the Multi-Ethnic Identity Measure (Phinney, 1992) along with six experimenter-generated questions concerning first-year college experience. Other variables included self-esteem, the Faith Maturity Scale (Benson, Donahue and Erickson, 1993) and self-reported Grade Point Average (G.P.A.). Results showed that students from the two schools found the schools equally welcoming and comfortable, despite striking differences in their ethnic composition. A strong ethnic identity was associated with higher G.P.A. and self-esteem, but only for TAMU-CC students. Higher ethnic identity was also associated with feeling comfortable by students on both campuses, and feeling welcomed on just the UTB campus. Faith maturity was associated with a perception of the campus as more comfortable and welcoming, but only for TAMU-CC students. Implications of this research are discussed.

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INTRODUCTION

Ethnicity is a term used almost every day: What is your ethnicity? Are you Anglo-American, Hispanic, African-American? Yet what really is ethnicity? According to Garcia (2000), four conditions make up ethnicity: 1) There must be a social group, 2) The group must have distinct and identifiable cultural or social traits, 3) The cultural and social traits that distinguish the group must come from outside the country where the group resides, and 4) Those traits must be considered alien to those accepted as mainstream in the country of residence. Defined by these conditions, ethnicity is a term used to describe those who do not equate with the mainstream culture and who, in some way, are alien to the country in which they reside. Originally, all ethnicities were once foreign to the United States yet through the years, the Anglo-American culture has become the mainstream culture. Hispanics, Asian-Americans, African-Americans, and others are alien ethnicity groups who have had to adapt to the conventional culture.

Gibson, Gandara, and Koyama (2004) point out that "some ethnic minority adolescents, including some Latinos, equate school with assimilation into the dominant culture and a concomitant rejection of their own language and culture" (p. 43). Latinos believe that doing well in school means that they are going against their heritage and traditions. Latino adolescents "believe they must choose between maintaining their ethnic identity and striving for high academic achievement, which to their peers may be viewed as acting superior or 'acting White'" (Gibson et al., 2004, p. 43). Building on research findings such as these, another question arises: Can minority students succeed academically and still maintain a strong sense of their ethnic identity?

Ethnic Identity

Ethnic identity, according to Tajfel (1981), is defined by how one values the importance of their ethnicity and how they associate with that ethnic group. Phinney (1990, 1992) characterizes ethnic identity as a complex construct including a commitment and sense of belonging, and involvement, in the cultural practices of one's own ethnic group. In essence, ethnic identity is how one relates to and how proud one is of their own ethnicity. Ethnic identity has been researched for decades, yet not until recently has research on ethnic identity of non-European Americans, including Hispanics, Asian-Americans and African-Americans, been conducted (Phinney & Kohatsu, 1997). Adolescents, who are not of European decent begin with an unexamined ethnic identity based on received views of their ethnicity derived from stereotypes and negative attitudes toward their group originating from the dominant society. In the United States, Anglo-American society, as aforementioned, is the dominant cultural system (Phinney & Kohatsu, 1997).

Research has shown that ethnic identity is positively related to measures of psychological well-being such as self-esteem (Devos & Cruz Torres, 2007; Roberts, Phinney, Masse, Chen, Roberts, & Romero, 1999) and lower levels of depression (Flores & Rodriguez, 1996). Ethnic differences in academic identification have typically been explored by examining the relationships between ethnic identity and academic outcome variables (e.g., GPA) (Devos & Cruz Torres, 2007). Research on high-achieving Puerto Rican students showed that those who had strong ethnic identity were able to do well academ-

ically and did not feel that they were "acting White" (Flores-Gonzalez, 1999).

METHOD

Participants

Participants were students from two universities: Texas A&M University at Corpus Christi (TAMU-CC) and the University of Texas at Brownsville (UTB). Approval from the Institutional Review Boards of each university was secured. A total of 135 undergraduate students from TAMU-CC enrolled in a general psychology class during the Spring 2009 semester participated in the research. Of those from TAMU-CC, 37% (n=51) were Hispanics, 40% (n=54) were Anglo-Americans, and 19% (n=27) were others, which consisted of African-Americans, Asian-Americans, "other" and "mixed" (parents from two different ethnicities). The mean age of TAMU-CC students was approximately 19 years of age (SD=1.3) and the modal class rank was freshman. These students were given extra credit for their participation. A total of 90 undergraduate students from UTB enrolled in two small size general psychology classes during the Summer 2009 semester were involved in the research. Of those who participated in the research, 82% (n=74) were Hispanics, 6% (n=5) were Anglo-Americans and 9% (n=9) were others, again consisting of African-Americans, Asian-Americans, "other, and "mixed." The mean age of UTB students was approximately 23 years of age (SD=6.2) and the modal class rank was sophomore.

Procedures

Before any information was gathered from the participating students, they were told that the research was voluntary and that they had the right to choose to be involved or not. Students were told not to write down their names and that everything was to be anonymous. Before they could answer questions, they were provided a consent form. Students were asked to answer as honestly as they could and told that they could leave questions blank, although they were encouraged not to. Most students took approximately 15 minutes to complete the surveys yet they were given more time if necessary. This was done at all three classes in which the data was collected. The students answered several measures provided to them in a booklet and after they finished answering the questions, they placed the booklets on top of a pile.

Measures

In conducting the research, four different general measures were used. The first measure was Phinney's (1992) Multi-Ethnic Identity Measure (MEIM), a 24-item scale in which participants respond to questions on a 4-point scale ranging from "strongly agree" to "strongly disagree," with higher scores indicating higher levels of ethnic identity. An example of a question from the MEIM is, "I am happy that I am a member of the group I belong to." Of the 24 questions, only 14 measure ethnic identity while the rest are divided into four subscales: Affirmation and Belonging (e.g., "I have a strong sense of belonging to my own ethnic group."), Ethnic Identity Achievement (e.g., "I have a clear sense of my ethnic background and what it means for me."), Ethnic Behaviors (e.g., "I am active in organizations or social groups that include mostly members of my own ethnic group."), and Other-Group Orientation (e.g., "I like meeting and getting to know people from ethnic groups other than my own."). All of these subscales were used in the analyses.

Second, six questions were generated by the experimenter in order to assess first-year experience. Specifically, the questions were designed to examine how comfortable one felt upon arriving at the university and how supportive was one's family (see Appendix). All questions were answered on a 5-point scale from "Very comfortable/supportive" to "Not at all comfortable/supportive."

The third measure, the Faith Maturity Scale (Benson et al., 1993), was used to measure "the degree to which a person embodies the priorities, commitment, and perspectives characteristic of vibrant and life-transforming faith" (p. 3). The scale consists of 38 items on a 7-point scale ranging from "Never True" to "Always True." An example of an item is, "My faith helps me know right from wrong."

Last, the student participants responded to the statement, "I have high self-esteem" on a 5-point scale ranging from "Strongly Disagree" to "Strongly Agree." This 1-item measure (Robins, Hendin, & Trzesniewski, 2001), used to assess self-esteem, correlates highly with other standard measures of self esteem such as the Rosenberg Self-Esteem Scale (Rosenberg 1965). Students also reported their estimated grade point average

(G.P.A.) and completed several standard demographic questions including gender, age, ethnic background, and year in school.

RESULTS

Self-Generated Items

Unless noted, the analyses below include findings on only the Hispanic students from each of the two universities. A series of tests were conducted in order to compare the students from TAMU-CC and UTB on the questions that concerned first-year experience. There were no statistically significant differences on any of the six questions (see Table 1). These results suggest that

TABLE 1: A comparison of Hispanic Students TAMU-CC and UTB on questions dealing with first-year experience

Question	TAMU-CC (n=51)		UTB (n=74)		t	p
	M	SD	M	SD		
How welcoming did you find this university?	4.08	.91	4.04	.90	.23	.82
How comfortable has this university been for you?	4.10	.83	4.22	.76	-.82	.41
How supportive were your family members when you first told them you wanted to attend college?	4.61	.87	4.68	.86	-.43	.67
How supportive were your family members when you first were accepted to go to college?	4.76	.65	4.76	.70	.06	.95
How supportive has your family been since you have been in college?	4.61	.72	4.68	.72	-.52	.61
How confident was your family in your ability to succeed in college when you began your first year in college?	4.61	.75	4.50	.92	.69	.49

the Hispanic students at the two universities typically do not experience their first years of college much differently from each other. The mean findings between the two schools were all very close to each other. Furthermore, the mean findings were all quite positive, indicating that the students in this sample had generally positive experiences during their first year of college and that their families had positive attitudes as well.

Ethnic Identity

Next, the ethnic identity constructs were examined using the MEIM. The students at both schools answered the MEIM in a very similar manner. The only statistically significant difference between the Hispanic students at the two schools was that the UTB students scored higher than the TAMU-CC students on the "Ethnic Behaviors" subscale, which includes the items "I am active in organizations or social groups that include mostly members of my own ethnic group" and "I participate in cultural practices of my own group, such as special food, music, or customs" (See Table 2). This could be because students from UTB really must interact with others of their own groups since there are so few from other ethnic groups in the area.

TABLE 2: A comparison of Hispanic students at TAMU-CC and UTB on the MEIM

Scale/Subscale	TAMU-CC (n=51)		UTB (n=74)		t	p
	M	SD	M	SD		
Ethnic ID Score	2.90	.45	3.01	.44	-1.55	.12
Affirmation and Belonging	3.31	.58	3.44	.50	-1.32	.19
Ethnic Identity Achievement	2.75	.47	2.80	.51	-0.56	.58
Ethnic Behaviors	2.32	.67	2.72	.76	-2.98	.00
Other Group Orientation	3.36	.43	3.37	.47	-0.09	.93

Ethnic identity could also be associated with other variables. The correlations between ethnic identity and several other key variables were examined. Looking at the data from both schools together, ethnic identity (i.e., the total score on ethnic identity) was positively correlated with selfreported G.P.A. ($r(113) = .26, p = .005$), self-esteem ($r(125) = .24, p = .007$), how welcoming the students found the university ($r(125) = .29, p = .001$), and how comfortable the university has been for them ($r(125) = .30, p = .001$).

However, a closer examination of the two schools individually revealed that not all of the correlations were consistent across schools. For example, while ethnic identity was positively correlated with G.P.A. for TAMU-CC students ($r(44) = .40, p = .007$), it was not correlated with G.P.A. for UTB students ($r(69) = .12, p = .34$). Likewise, ethnic identity was positively correlated with self-esteem for TAMU-CC students ($r(51) = .31, p = .025$) but not for UTB students ($r(74) = .18, p = .14$).

These results suggest that ethnic identity may "matter" more for students in an ethnically diverse university than for those in an ethnically similar university.

Faith Maturity

The relationship between the Faith Maturity Scale (FMS) and the other variables was examined next. No overall differences on the FMS between the schools or between males and females were found. Furthermore, at TAMU-CC no differences were found on the FMS scores between Anglo and Hispanic students.

Overall, scores on the FMS were positively correlated with self-esteem ($r(120) = .37, p < .001$), meaning that students who scored higher on the FMS were also more likely to have higher self-esteem than those students who scored lower on the FMS. A slightly confusing result was that the scores on the FMS were also positively correlated with the question about how comfortable that university has been for the student ($r(120) = .20, p = .033$). Although not expected, this indicates that students who scored high on the FMS were also more likely to find the university environment comfortable.

Looking at each of the schools individually, a slightly different picture emerges. At UTB the only statistically significant correlation with faith maturity was with self-esteem ($r(69) = .25, p = .037$). As with the overall scores above, student respondents scoring higher on faith maturity also tended to have higher self-esteem. This pattern was found in the Texas A&M University-Corpus Christi students as well ($r(51) = .50, p < .001$), although the correlation was a bit higher. Interestingly, the FMS scores were also positively correlated with two of the first-year college experience items, namely how welcoming they found this university to be ($r(51) = .48, p < .001$) and how comfortable the university has been for them ($r(51) = .43, p = .002$). So higher scores on the FMS are positively correlated with a better first impression of the university, but only for TAMU-CC students; UTB students did not show this pattern. This findings could indicate that the religious background of the students at UTB is more homogeneous (i.e., Roman Catholic) than the students at TAMU-CC, and for some reason not clearly indicated, this means that their FMS scores are more related to the first-year experience. Further research is needed in this area.

DISCUSSION

The pattern of results suggests a strong similarity between the student populations at the two universities. Despite TAMU-CC being approximately 41% Hispanic and UTB being approximately 92% Hispanic, the first-year experiences of the students were very similar. Both TAMU-CC and UTB students found their respective universities to be quite welcoming and comfortable. These results suggest that both universities are doing a good job of making their students feel comfortable and welcomed during their first year.

The ethnic identity results were also similar across the two samples. The means for the total ethnic identity score and the subscales were very similar. However, some differences did emerge. Higher ethnic identity was associated with more positive outcomes (i.e., self-esteem and G.P.A.) for the students in the TAMU-CC sample, but not for the students in the UTB sample, which could be an indication that ethnic identity is much more salient for the TAMU-CC students because of the ethnic composition of both the university and the surrounding community. TAMU-CC is located within the South Texas city of Corpus Christi, which is approximately 55% Hispanic. It is a much more ethnically heterogeneous city than is Brownsville, and it is possible that ethnic identity is more salient and more of an issue for students in the Corpus Christi area than for those in the Brownsville area. Further research in other areas in Texas and the United States is needed to answer this question fully.

Faith Maturity was found to be associated with some positive outcomes, but mostly for TAMU-CC students. Although a comparison of the means and standard deviations between the two schools revealed no significant differences, there still were some stronger associations for the Texas A&M University-Corpus Christi students than for the UTB students. These results suggest that for TAMU-CC students, religious faith is, again, more salient and more closely related to other first-year experiences. TAMU-CC students who scored high on faith maturity were more likely to experience some positive first-year outcomes, whereas their counterparts at UTB were less likely to. It could be that although scores on the FMS were relatively similar between the two schools, the type of faith (Roman Catholic for UTB students; a variety of Roman Catholic, Baptist, and nonde-nominational for TAMU-CC students) may be a factor in the difference. Further investigation into this topic is also warranted.

DIRECTIONS FOR FUTURE RESEARCH

The results suggest several different directions for this research. I would like to continue my research on ethnic identity with other universities in the Rio Grande Valley. It is possible that universities in other cities along the Rio Grande Valley (e.g., Laredo, McAllen) offer their students quite different experiences than the ones I studied. In addition, I would like to gather a larger sample of respondents from each of these universities.

I would also like to compare the data gathered from TAMU-CC and UTB with that of Texas A&M University at College Station, which is a predominantly Anglo-American university. It would be interesting to investigate the influence of ethnic identity on the Anglo-American students farther north in Texas.

And last, I would also like to compare a university with a large population to a university with a small population and note if there are any differences. Will a larger student population hold more diversity than that of a smaller population?

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APPENDIX – SELF-GENERATED QUESTIONS

How welcoming did you find this University environment?

How comfortable has this university been for you?

How supportive were your family members when you first told them you wanted to attend college?

How supportive were your family members once you were accepted to go to college?

How supportive has your family been since you've been in college?

How confident was your family in your ability to succeed in college when you began your first year in college?

THE EFFECT OF DENSITY DEPENDENCE ON THE GROWTH RATE OF RED DRUM VIA RNA: DNA RATIO ANALYSIS

by NORMA MARTINEZ

ABSTRACT

Density dependence is the relationship between the density of organisms during a specific period in their life cycle and the positive or negative impact of feedback mechanisms. Red drum (Sciaenops ocellatus), an economically important fish species, are one of many fish species that are dependent on estuaries to act as nurseries for their young. Estuaries provide the tools necessary for rapid growth and recruitment that govern the dynamics of marine fish population under low densities of conspecifics. Growth rates can be used to determine whether environmental conditions are adequate to sustain a population of marine life. Two methods commonly used to determine growth rates are RNA: DNA ratio analysis and otolith microstructure analysis. These methods provide a cage free method that prevents the negative effects of an artificial environment and can provide data as accurate as 1-3 days prior to the sample dates. Due to the variance in optimal homogenate volumes between species, a preliminary procedure to determine the optimal homogenate volume must be performed. Expected optimal homogenate volumes for three size classes of juvenile red drum were determined. This information will later be used in a comparative study assessing growth rates between different nursery areas using RNA: DNA analysis.

INTRODUCTION

The relationship between the density of organisms during a particular period in their life cycle and the negative or positive feedback mechanism is known as density dependence (Craig, 2007). Estuaries play a huge role in the growth and development of marine life. Red drum (*Sciaenops ocellatus*), an economically important fish species, are one of many species of fish that are dependent on estuaries to act as nurseries for their young. Estuary dependent fish rely on these nurseries to provide the environment required for rapid growth (Mercaldo-Allen, 2008). A high quality environment provides greater food availability and greater protection against predation, necessary for good structure and dynamics of marine fish populations (Connell & Jones 1991; Eggleston, 1995).

One method to determine whether density has a negative or positive effect on marine life and/or if the environmental conditions are adequate to sustain marine life is through the measurement of growth. In order to

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avoid the negative effects of caging methods, growth can be analyzed via RNA: DNA ratio analysis and through otolith microstructure analysis which act as a proxy to determine growth rates. Like the trunk of a tree, an otolith has rings which can be used to determine the growth rate at various life stages. Greater distance between otolith rings is representative of faster growth rates, while a smaller distance is representative of slower growth rates. The amount of DNA produced as a fish grows remains constant, but the amount of RNA varies depending on the rate of growth. Faster growing fish will have high RNA: DNA ratios, while slower growing fish will have small RNA: DNA ratios.

Objective 1:

The first objective of this experiment was to determine the growth rates of Red drum in Packery Channel and Aransas Pass via RNA:DNA ratio analysis in order to determine what effects, if any, density dependence is having on marine life.

Objective 2:

The second objective is to determine the optimal homogenate volumes for different size classes of Red drum.

The RNA: DNA ratios respond to environmental conditions after periods as short as 1-3 days thus, providing an accurate and recent description of the fish's current environment (Buckley, 1999). The information obtained from RNA:DNA analysis will complement previous studies of otolith microstructure analysis and density-dependence studies in attempting to assess growth patterns in these estuaries. Our hypotheses for these experiments are:

H_o1: The optimal homogenate volume does not differ with size class of fish.

Ha1: The optimal homogenate volume is dependent upon the size class of the fish.

H_o2: There will be no difference between the RNA: DNA ratios in Packery Channel as compared to those in Aransas Pass.

Ha2: There will be a difference between the RNA: DNA ratios in Packery Channel as compared to those in Aransas Pass.

FIGURE 1: Sampled locations: Aransas Pass, Corpus Christi Bay (Packery Channel), Upper Laguna Madre (n =36).
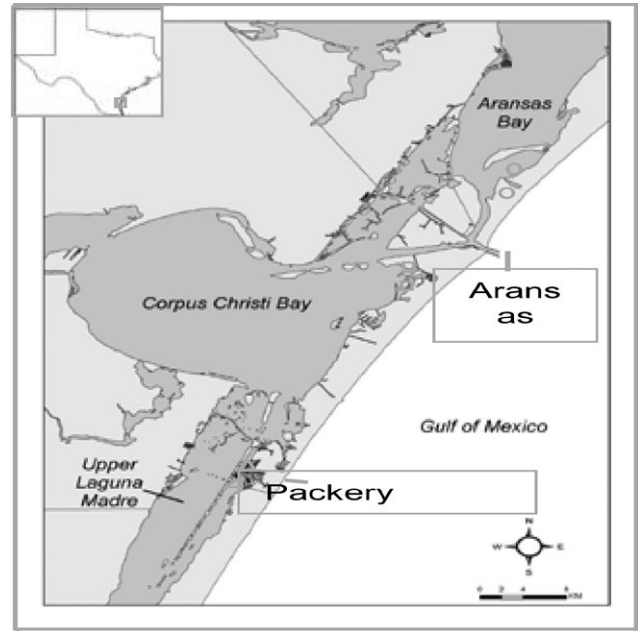
TABLE 1: Experimental Procedures, each group contains twelve different samples obtain from two different bays, Corpus Christi Bay (Packery Channel) and Aransas Pass.

Methods

Volume of NaCL (µL)	Group A 15- 20 mm	Group B 20-25 mm	Group C 25-30 mm
200	35(A)	31(A)	N/A
400	36(A)	32(A)	N/A
600	42(A)	33(A)	39(A)
800	43(A)	41(A)	46(A)
1000	44(A)	37(A)	51(A)
1200	48(A)	40(A)	55(A)
1400	102(C)	104(C)	107(C)
1600	103(C)	105(C)	109(C)
1800	108(C)	106(C)	114(C)
2000	110(C)	111(C)	128(C)
2200	112(C)	115(C)	130(C)
2400	117(C)	116(C)	137(C)
2600	N/A	N/A	34(A)
2800	N/A	N/A	38(A)
# = sample number	(A) = Aransas Pass		
(C) = Packery Channel			

Juvenile Red drum were collected from Corpus Christi Bay (Packery Channel), Upper Laguna Madre, and a natural tidal inlet in Port Aransas (Figure 1). Samples analyzed for this experiment were from Corpus Christi Bay (Packery Channel) and Aransas Pass. Muscle tissue

samples were immediately placed in liquid Nitrogen in the field, then stored in a 80°C freezer to prevent degradation in the quality of the nucleic acids in the fish.

As a preliminary procedure, thirty-six (twelve per group) of the samples collected were separated based on weight into three groups (A,B and C) in order to determine the appropriate homogenate volume needed to perform the RNA:DNA ratio analysis. Group A size class ranged from 15 – 20 mm, group B consisted of weights ranging 20 – 25 mm, and finally group C ranged from 25 – 30 mm. Portions of the muscle tissue from the trunk of the fish were homogenized in a sodium chloride solution using an Ultra Turrax fish tissue homogenizer. During the entire procedure all materials used were kept on dry ice or an ice bath in order to prevent any deterioration of the sample. To obtain the best possible homogenate volume, volumes of the sodium chloride solution ranging from 200 μL to 2600 μL (600 μL – 2800 μL for group C) were tested with each group (Table 1). Once samples were homogenized, they were centrifuged at 4°C for twenty minutes at 3000 rpm. After centrifugation the supernatant liquid was removed with a pipette and transferred to a clean tube. After supernatant liquid was successfully transferred, all samples were immediately stored in -80°C freezer, to keep samples from deteriorating.

RESULTS

Seventy two total samples were obtained from Aransas Pass, Corpus Christi Bay (Packery Channel), and Upper Laguna Madre. Density dependence studies indicated that the mean density for samples from Upper Laguna Madre and Corpus Christi Bay did not differ significantly(Figure 2). Since there was no significant difference between these two sites, only samples from Corpus Christi Bay (Packery Channel) were used in RNA:DNA analysis. Aransas Bay did show a significant different in density from the other two bays. Due to unavailability of important enzymes needed to complete the procedure this experiment was not completed. However, we generated expected optimal homogenate volumes for three size classes of fish Group A (15-20mm) at 600 μL, Group B(20-25mm) at 1400 μL, and Group C (25-30mm) at 2200 μL (Figure 3). We generated a best fit line (y = 714.29x) which could be used in future studies to determine the optimal homogenate volume for a sample by locating sample size and determining the optimal homogenate volume.

FIGURE 2: Mean Density of Juvenile Red Drum in three south Texas bays. Corpus Christi Bay (CCB) and Upper Laguna Madre (ULM) did not show a significant difference, which is denoted using a bar below data from CCB and ULM, compared to data from Aransas Pass (P<0.001)
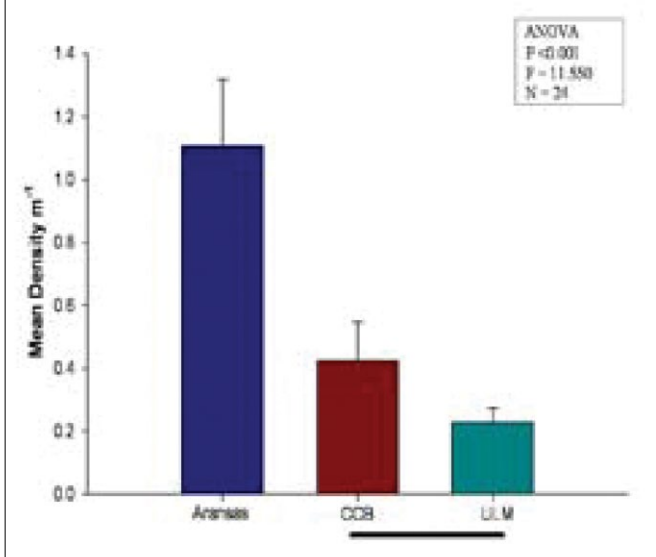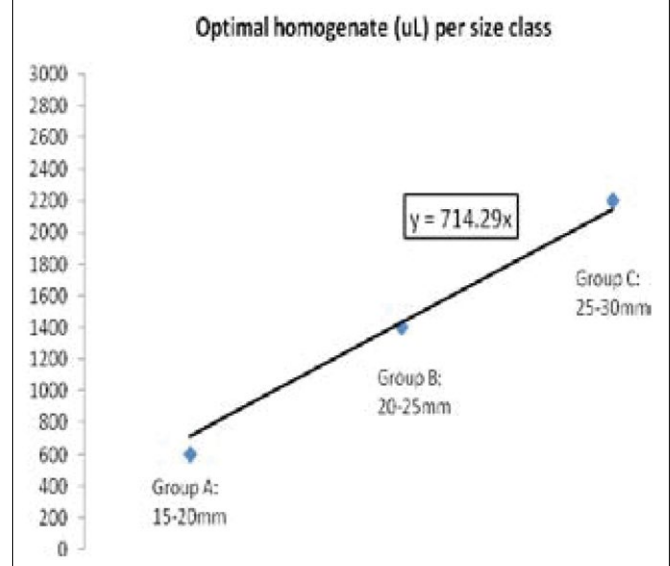

FIGURE 3: Expected optimal homogenate volumes per size class. Group A, Group B, and Group C were all assigned an expected homogenate volume.

DISCUSSION

As detailed in Figure 1, samples were obtained from three different bays: Corpus Christi Bay (Packery Channel), Upper Laguna Madre, and Aransas Pass. The mean density for Corpus Christi Bay and Upper Laguna Madre did not show a significant difference. Therefore these two groups were put into one category. When homogenizing samples, only samples from Corpus Christi Bay (Packery Channel), and Aransas Pass were analyzed. When conducting RNA: DNA ratio analysis optimal homogenate volumes vary between species of fish. In order to obtain accurate data, optimal homogenate volumes must be calculated as a preliminary procedure. During the homogenization process, sample 34(A) at a volume of 200 μL and sample 38(A) at a volume 400 μL did not contain enough solvent to properly dissolve tissue in the Ultra Turrax fish tissue homogenizer. Instead these samples then became labeled as sample 34(A) at a volume of 2600 μL and 38(A) at a volume 2800 μL. Due to the unavailability and deterioration of important enzymes the optimal homogenate volume was unable to be determined. However, expected optimal homogenate volumes were generated. For Group A (15-20mm) the expected optimal homogenate volume was 600 μL for Group B (20-25mm) 1400 μL and for Group C (25-30mm) 2200 μL. Preliminary data concluded that we reject our first null hypotheses (Ha1) and accept our first alternative hypotheses. The data obtained from the preliminary procedure can be used to determine optimal homogenate volumes by using the equation (y = 714.29x) for a specific size class of red drum. The next step of this procedure would be to compare the RNA:DNA ratios of Red drum from Upper Laguna Madre (Packery Channel) and Aransas Pass to test our second hypothesis.

By using DNA: RNA ratio analysis and otolith microstructure analysis, we eliminate the drawbacks of using field enclosure methods. Field enclosure methods are used to measure growth during a short period of time in an artificial environment which could potentially provide inaccurate data by exposing the individual to conditions that normally would not be experienced.

Growth rates are a key indicator of the type of environmental conditions fish populations are exposed to. Maximized growth indicates optimal conditions; poor growth rates indicate poor environmental conditions. Rapid growth rates not only increase the size of fish, but also increase the survival rates. Slower growing individuals are more likely to spend longer periods of time in size ranges that are more vulnerable to predators. This data provides insightful life history information for Red D≠rum that can help identify and implement effective management and protection techniques for certain habitats.

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MAGIC IN MY NEIGHBORHOOD: CURANDERAS AND FOLK HEALING IN LATE TWENTIETH-CENTURY CORPUS CHRISTI, TEXAS

by MARTHA V. RUÍZ

In 1976, when I was twelve years old, I witnessed the tragic death of a four-year-old neighbor named Abel. To my dismay, Abel was shoved out of his parent's driveway while on a tricycle and pushed into oncoming traffic by his older cousins playing with him. The sound of the car's speeding engine caused me to look up from the book I was reading and into the direction of both Abel and the vehicle as they were about to collide. I tried to yell Abel's name, but my voice was stuck in my throat. Every memory from that point on became slow motion. The echo of slamming brakes, the sound of Abel and his bike wheels spinning under the tires of a green older model coupe were too much to bear. Flash forward…a paramedic places a crisp, white sheet over Abel's small body. The reality of this little boy's death is made clear by this gesture. Soon, Abel's mother would have a

nervous breakdown and I would have endless sleepless nights from that day forward. A few days passed and Father Paul, the local Catholic community parish priest, was summoned to my parent's home. My mother recounted the events leading to Abel's death, and how I, her daughter, could no longer sleep. From the moment I would close my eyes I would relive the sounds and scene of that terrible car accident. The Catholic priest said a prayer over me and then, as if I wasn't there, he told my mother that if all else failed to give me a tablespoon of sugar. This, he said, would take the fear away. Both the prayer and sugar did not work. It was then that the spiritual holistic healing from a female relative brought me into the domain of curanderas. Within 3 days, I was "magically" cured of what is called "susto" or an ailment of fright. Several decades have passed but I have never forgotten Abel. I still think of him from time to time. By the same token, I cannot forget those women–the curanderas–who were responsible for giving me a good night's sleep after Abel's death.

This project is a history of four Mexican-American female curanderas in Corpus Christi, Texas in the late-twentieth century, and documents their experiences as folk healers. The women represent three generations of curanderas in one family. Curanderismo is the process of folk healing that has been practiced by Mexican-Americans in the Southwest. This study examines how

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these four curanderas experience and understand their role and place in the local community. Through their tape recordings and many home visits, I investigate how they combine their Roman Catholic orthodoxy with their practice of the "holistic healing power" of curanderismo among clients who request their advice, irrespective of socioeconomic class, race and gender. I explore how examining these women's experiences, practices and identities sheds light on the reasons why, despite modern medical technological development, a wide variety of Corpus Christi residents continue to seek their services.

I argue that despite modern medicine, these four Mexican-American women have retained their gifts of healing because of their Mexican- American cultural traditions, as well as their Catholic faith. Based on these four women's testimonies, my research documents how religion and the practice of curanderismo survive in the lives of a three generational family not previously studied by scholars or recorded in textbooks. This study adds to the body of knowledge already written about Mexican-American folk healers in South Texas and, in particular, in Corpus Christi. The enduring role of Mexican-American women emerges through their steadfast faith in Catholicism as evidenced by the spiritual symbols found throughout their home. In this way Mexican-American women who practice curanderismo have preserved traditions they inherited while forging a place for themselves in the community.

CURANDERISMO

The terms "curanderismo" and the term "curandero/a" come from the Spanish verb "curar," which means "to heal."[1] The term "curandera" is given to a woman who has skill in the healing arts and is a recognized healthcare provider in her community. The call to becoming a curandera, in which an individual receives a calling to service, is called a *don* (gift) and this calling is bestowed by the community. Curanderismo is a deeply rooted tradition of Mexican-Americans. Historian Rafaela Castro explains that, "curanderismo is the process of folk healing, similar to much contemporary alternative medicine in its holistic approach, without recognition of a separation between mind and body, as practiced in the medicine and psychology of the western world."[2] The term "curandera" is thus given to a woman who has

achieved both skill and public success as a folk doctor or folk healer.

Scholarly analysis of contemporary Mexican-American female healers is scant and the research that has been done comes from three different fields: anthropology, which focuses on spiritual practices; religion, which focuses on spiritual practices with gender analysis; and history, which focuses on religious activity, specifically Catholicism that depicts Mexican-American females as leaders. My goal is to combine these studies into a history that examines Mexican-American female healers. Through oral interviews, I add to this body of research a new examination of the lives of modern-day curanderas who live in Corpus Christi's Molina neighborhood.

A number of scholars and historians have written about curanderismo and various spiritual healers in the Southwest. Health care beliefs and practices are often the focus of studies tracing the historical development of Mexican-Americans. Scholar Beatrice A. Roeder describes the evolution of these practices beginning with Captain John G. Bourke's assertion "that the seven centuries of Moorish domination of Spain had a considerable impact upon all aspects of Spanish life, and that certain folk medical traditions (among others) must be of Arabic origin."[3] Roeder groups the works of Mexican scholars Gonzalo Aguirre Beltrán, George Foster, Tibo Chávez, and Arthur L. Campa into a rough chronological order and into four categories: sources and historical development of Mexican folk medicine, pioneer documentary works, studies that place health practices into their cultural context, and contemporary research by scholars who explain Mexican-American health practices. The emphasis and methodologies used by these scholars have been influential in this study. However, the perspectives of modern-day, female curanderas as bearers and transmitters of a rich and continuing folkloric tradition is neglected. These aspects are obtained within the oral histories of the subjects of this study.

Curanderismo has been practiced by Mexican-Americans in the Southwest, Latin America, and other places since the start of the Columbian Exchange as early as 1492. Anthropologists Robert T. Trotter and Juan Antonio Chavira explain that "at least six major historical influences have shaped the beliefs and practices of curanderismo by Mexican-Americans in the Lower

Rio Grande Valley: Judeo-Christian beliefs, symbols and rituals; early Arabic medicine and health practices (combined with Greek humoral medicine, revived during the Spanish Renaissance); medieval and later European witchcraft; Native American herbal lore and health practices; modern beliefs about spiritualism and psychic phenomena; and scientific medicine."[4] These scholars provide a detailed history of curaderismo's development as civil settlements formed under Spanish influence. Relationships and in-depth inquiries with practicing curandero/as explain the different levels of practices found within this health care system.

Despite the steady stream of literature about Mexican-American folklore practices, there has been very little scholarship regarding Mexican- American women healers. In 1992, Chicana historian Yolanda Broyles-González wrote that "[a]mong the areas least explored within Chicana/o studies is the realm of spiritual practices."[5] Written works on the subject of spirituality and holistic healing can be found, but most sources by contemporary writers cite from research done decades earlier. In her study, Broyles-González expands on the work of Trotter and Chavira by including gender analysis. There is much to be gained by having current documentation about women who practice curanderismo, not only at the local level, but nationally too.

Historian Mario T. García's anthology on being a Chicano Catholic suggests that "by struggling to maintain, adapt, and pass on particular ethnic religious traditions, Chicanos have affirmed their identity and religious culture."[6] García notes that Hispanics have constituted a relatively small and frequently overlooked group within American Catholicism. He contributes to the historical work the significant role of religion, faith, and spirituality in the lives of Chicano Catholics, but his work does not say enough about women's roles, and specifically does not help us understand the lives of Mexican-American women in the twentieth century who are Catholic. Because of this lack of attention to women, García's work did not produce any greater understanding of their lives or their roles in Chicano history. His resources include scholars that have studied the roles that religion plays in San Antonio, Houston, and Victoria, Texas. As such, the research of four Catholic female curanderas in Corpus Christi will contribute to this developing field. Because although both men and women

do whatever is necessary to survive, it is the woman who has generally taken on the responsibility of providing health care for her family in Mexican-American culture.

Chicana historian Vicki L. Ruiz states that "claiming public space can also involve claiming cultural spaces,"[7] which is exactly what can be concluded about women of color in communities across the nation and abroad. Mexican-American women have struggled, surviving a multitude of encounters such as discrimination and identity issues. Ruiz adopts a woman's perspective, which is important because past works gave little attention to gender and the paths taken by women to accommodate and claim their cultural space within societies. Where previous historians did acknowledge that women's roles were integral to health care, a majority of the studies focused almost exclusively on male practitioners. Through agency, Mexican-American women can rightly claim the practice of curanderismo as part of their social, political and religious rights. Through cultural coalescence, "immigrants and their children pick, borrow, retain and create distinctive cultural forms… cultures rooted in generation, gender, region, class, and personal experience."[8] In this way, the curanderas have adapted alongside social and environmental factors that have changed over time.

Some scholars have attempted to address curandera practices but fail to see the viability of a post-modern or post-colonial tradition. For example, Sara Carrasco's 1984 dissertation study offers a descriptive study of the curandera's techniques and practices in Laredo, Texas.[9] Carrasco points out that curanderismo remains a vital element of Mexican-American culture. In focusing on the origin and practices used, her work fails to explain why clients continue to seek the services of curanderas despite modern medical practices. Anthropologists Bobette Perrone, H. Henrietta Stockel, and Victoria Krueger also used interviews to explore curanderas, Native American medicine women, and female physicians to explore "the internal consistency of each culture's [healing] system."[10] While the curandera biographies are captivating, the scholars' assertion that "the curanderas' tradition seems in danger of extinction due to the Hispanics' strong desire to acculturate" ignores the continuing, widespread practice of curanderismo in the Southwest. Nevertheless, the authors demonstrate how

the practices and medical education of the interviewees have opened up paths of discovery for continued gender studies and healing practices of women.

Under Spanish influence, the history of Indian curanderismo in colonial Mexico developed as settlements were formed. According to colonial Mexican scholar Sherry Fields, most of what we know today about ancient Mexican medicine comes from documents that were compiled by Spaniards after the fall of Tenochtitlán in 1521.[11] Eventually, European medical concepts were combined with native medicine. Fray Bernardino de Sahagún, who wrote the Florentine Codex, included a discussion of the Nahua medical knowledge of Mesoamerican healers. Within the codex lay clues to who these healers were, where they fit in the social hierarchy, and the types of services they offered. Three social classes emerged as part of colonial Mexico's society: the prosperous Spanish physician, the indigenous curandero/a, and the Afro-Mexican healer. These multiple healing practices reflected the social and cultural plurality of colonial Mexican society. Indian healers or curandera/os also known as "tícitl," which means "the one that helps," retained much of their medical culture after the arrival of Europeans.[12]

The Spaniards promoted a social order, the sistema de las castas, in which racism primarily determined identity and social rank in Mexico. As for the Catholic Church's role, Chicana Broyles-González argues that "with the onslaught of the European language, each tribe also adopted the obligatory Catholic camouflage. It was do or die, but each tribe in the Americas did Catholicism and the Spanish language in its own native register…thus each Mexican region has birthed and worshiped in its own way its own popular saints."[13] As a consequence, multiple forms of religious syncretism evolved.

Historian Joan Bristol explains that "the Spanish crown and church were instrumental in creating and maintaining a social hierarchy that defined and limited residents' economic, occupational, religious and social opportunities."[14] Spanish Europeans who could prove their lineage were free of Jewish and Muslim influences had "*limpieza de sangre*," or purity of blood which would be a requirement to obtain a license to practice medicine in colonial Mexico. The Royal Protomedicato was a governing licensing board for those doctors,

curanderos, midwives and hospitals providing medical services. Casta (mixed blood) medical practitioners occupied the lowest urban class. This social hierarchy, because of race, would keep non-Spaniards subordinate. This strategy continued to exist as there was always a need for the medical sector, regardless of race, gender, or class in colonial Mexico. The plurality of the mixed populations caused each sector to use distinct healing traditions and practices while reinforcing their own ethnic folk customs, traditions, and rituals to retain solidarity.

The racial and cultural background of the colonial Indian healer brought together supernatural elements from their pagan heritage and mixed them with Christian doctrine. Broyles-González reports, "the curanderas, with their herbal medicines mixed with their Catholic faith, filled a large void. They doctored the sick and helped at births as parteras, or midwives."[15] Although the Catholic Church condemned use of statue imagery and incantations by curanderos and even though the Spanish called the curanderos "witchdoctors," Indian healers and curanderos, to the present day, continue to use prayers and orations to solicit the help of the Virgin of Guadalupe, Jesus, and other saints when applying herbal remedies and using their curing techniques. By mixing and blending healing habits and practices, New World Indian medicine or "curanderismo" prevailed and evolved well into the eighteenth and nineteenth centuries.

BACKGROUND

In order to investigate the lives of four Mexican-American, Catholic, female curanderas, one has to understand their environment and surroundings. South Texas is a U.S.-Mexico borderland and is well known for its strong Hispanic presence. Corpus Christi, which means "Body of Christ" in Latin, was named by Alonzo Álvarez de Pineda in 1519 on a Roman Catholic feast day. Corpus Christi was a ranching and agricultural region whose prominence did not rise until 1838 when Colonel Henry Lawrence McKinney established a trading post. Many native Mexicans lost their land claims following the U.S.-Mexico War of 1846-1848, forcing them into second class citizenship. Although the Treaty of Guadalupe Hidalgo assured Mexican-Americans "the enjoyment of all the rights of citizens of the United

States" and protection for their liberty and property, Senate amendments soon stripped Hispanics of genuine protection against Anglo encroachment. As Mexicans lost their land to Anglos in Texas and became a cheap labor pool, racism increased.[16] Then, fueled by the Mexican Revolution in 1910, the first large wave of Mexican immigrants were driven north and established viable communities within south Texas and throughout the U.S. When the Great Depression hit the U.S. many looked for a scapegoat, and found it in Mexican Americans. Jobs were scarce and discrimination by Anglos was common place. The industrial boom brought on by World War II opened many new job opportunities for Mexican-Americans, but management of these firms typically relegated Mexican workers to jobs that paid the lowest wages. As Emilio Zamora points out, "although Mexican and African American workers assumed skilled jobs also held by Anglos, their job classification and pay normally remained unchanged."[17] Thousands of Mexicans continued to immigrate to the U.S. following the war. Among those who moved to South Texas and made Corpus Christi their home were Abuelita García, and her daughter Tracie, two of the four subjects of this study. Currently, Corpus Christi is the eighth largest city in Texas with a population of 282,024 residents. Fifty-eight percent of the city's population claims Hispanic ethnicity.[18]

The participants for this study, with the exception of Bonita, live in the barrio of Molina, a Westside subdivision of Corpus Christi. The Molina neighborhood encompasses a ten-mile radius and is approximately seven miles northwest of the Gulf of Mexico. The barrio has maintained its own schools since 1884.[19] According to 2005-2006 demographic information from the West Oso School District, 83.7% of the population is Hispanic; 14.7%, African American; and 1.6%, Caucasian. Eighty percent of the students in the district are considered economically disadvantaged.[20] Corpus Christi is also well-known for being home to civil rights activist Dr. Hector P. García, who acknowledged the practice of curanderismo and kept a 1961 *Time* magazine article entitled "A Cure for Curanderismo" in his medical office. The article described "a wife seeing her [tubercular] husband racked by coughing and wasting away, called in a curandera (healer), who prescribed donkey milk."[21] The article, as well as Dr. García's decision to post it in his Westside office lobby, is representative of the public acceptance of consulting a curandera as an alternative healthcare practice in the twentieth century.

THE INTERVIEWEES

Upon beginning this research of Mexican-American women's health care practices, little did I know that I would be allowed admittance into so much more than these curanderas' worldviews, faith, and cultural identity. After each interview, which I conducted at their homes, I was always offered a beverage to drink. Sometimes it was homemade lemonade or a soothing cup of freshly-brewed manzanilla (chamomile) tea which I sipped while listening to "magical" stories reflective of their Mexicana heritage. These stories include the account of how a sibling was diagnosed by an American doctor with meningitis and given fourteen days to live, only to be cured by an elderly curandera who broke a dozen eggs in her spiritual practice to "*curar*" the baby. Another story involved the account of Abuelita, the fourth woman in this study, who was bedridden for seventeen years and who travelled from the U.S. to Mexico to be cured by an elderly curandera. In still another session, I was taken on a historical journey as Abuelita proudly displayed her perfectly intact immigration card stamped in 1948, which she used to join the millions of other first-wave immigrants who entered the U.S. in the midtwentieth century. Inside the immigration card, I found a photograph of the beautiful, thirty-seven-year-old Abuelita along with her two children, Tracie and Gus.

The four women interviewees for this oral history research project are three generations of one family, and practice a Roman Catholic orthodoxy. Bonita, Mercy, Tracie and Abuelita (grandmother) range from thirty-eight to ninety-eight years of age.[22] Abuelita's and Tracie's "resident alien" border-crossing identification card is dated December 17, 1948, the day they immigrated together to the U.S.[23] Bonita and Mercy, who are U.S.-born, are louder and laugh more. They are fairly representative in their mannerisms and speech of contemporary South Texas Mexican-American women, raised in the generation of slain Tejana superstar Selena Quintanilla Perez who grew up in their neighborhood.[24] All of them, except for the ninety-eight year old Abuelita who has retired, continue to practice the "holistic healing

power" of curanderismo among Mexican-Americans and others who seek their advice, irrespective of socio-economic class, race or gender.

BONITA: Bonita is a thirty-nine year old Mexican-American female. She was born and raised in Corpus Christi and is currently a correctional facility officer.[25] Bonita has three sisters and one brother. She is talkative and the loudest of the participants. Bonita is intuitive and can recite "remedios" (remedies) for many ailments by memory. Bonita, in her own words, has psychic abilities.

Mercy, on her wedding day.

MERCY: Mercy is Bonita's older sister.[26] She is forty years old, and was also born and raised in Corpus Christi. Mercy is married, a former bank employee, and is currently a stay-at-home mother to a two-year-old daughter, Miranda, who, according to the elders in this family, has the "gift." Mercy's mother-in-law is a curandera in Mexico who advised her which herbs to gather and boil in order for her to conceive a child after eight years of marriage had not worked.

TRACIE: Tracie, seventy years of age, is Mercy and Bonita's mother.[27] Tracie was born in Anáhuac, Nuevo León, Mexico on August 13, 1938, during which time Lázaro Cárdenas was president of Mexico. Tracie was nine years old when she immigrated with her mother and older brother to the U.S. during President Harry S. Truman's administration. She, like her entire family is Roman Catholic. She is married and has four children. Tracie does not identify herself as a curandera.

Tracie, age 70, as she waters her plants in what seems to be a never ending garden.

She describes herself as a person who people consult for advice on such things as using herbs to cure common illnesses such as "mal de ojo" or ailments such as migraines or stomach disorders. Despite not identifying herself as a curandera, Tracie is a healer in the eyes of her clients. Many clients seek Tracie for counseling and advice in family matters such as marriage problems or financial issues.

ABUELITA: Abuelita is the matriarch of this family. She is ninety-eight years old and was born on February 20, 1911, at a hacienda called San Isidro Labrador, Tamaulipas, Mexico when Porfirio Díaz was the liberal president of Mexico. Married at the age of sixteen to Manuel Garza, Abuelita prepared her own immigration papers in 1947 when she was thirty-seven years old in order to enter the U.S. Manuel was already living and working in Corpus Christi; he died in 2001.

Abuelita gave birth to five children, two of whom are deceased.

Data for this research was obtained by visiting local libraries, doing archival research and conducting personal oral interviews. In order to examine the lives of the women and document the findings, a majority of the questions were created to elicit the perspective of each curandera, so each one could give her own answers without the presence of one another. A questionnaire was prepared which posed direct questions about religion, tradition, culture, and daily life. Several themes emerged: the changing practices over time; the impor-

tance of the Catholic Church, religion, ethnic heritage, and symbols such as gardens, saints, and candles.

CULTURAL TIES

By analyzing responses from the oral interviews, I found evidence regarding how these four women's healing "gifts" linked their Catholic religion and ethnic heritage. They explained that their "gifts" had been passed down from generation to generation. They demonstrated this by sharing the genealogy of the curanderas within their family from Abuelita's own grandmother (born in the mid-1800s), to her mother, to herself, to her daughter, to her granddaughter and, now, to her great-granddaughters. All four interviewees received their holy sacraments at Our Lady of Pilar Catholic Church, which was established in 1966. The church is located on Bloomington Street, the same street that Selena Quintanilla Perez lived on before her untimely death in 1995. When asked about the role of Catholicism and the importance of religion in their family, the Garcías shared the following responses.

Q: What was the role of religion in your family?

Abuelita's response: Católicoismo. La iglesia católica patrocinaba todas las fiestas. Todos los eventos eran patrocinados por los católicos. Íbamos a las clases de catecismo, asistíamos a la misa, e íbamos a los bailes en terreno de la iglesia. Una tía nos acompañaba a estas reuniones socials y nos caía muy bien. En esta época no había ninguna otra religión. Todos eran católicos. Alabábamos la estatua de la Virgen de Guadalupe y cantábamos sus alabanzas después de las fiestas antes de irnos caminando a casa. (Catholicism. All the fiestas were sponsored by the Catholic Church. All events were Catholic sponsored. We went to Catholic Church classes, attended mass and went to dances on church grounds. An aunt chaperoned us to these functions and we liked her very much. At this time there was no other religion. All were Catholic. We praised the statue of the Virgin of Guadalupe and sang her praises after the fiestas, before we walked home.)

Bonita: "Oh, my God, it's one of the biggest ones [roles] here. My grandma taught us the old ways of Catholicism, dating back from their childhood in Mexico, and also, my parents, we were brought up Catholic. We were, you know, God fearing people."

Mercy's response: "It played a big role, because every night before we went to sleep Grandma would make us say the rosary before we went to sleep…and sometimes we would fall asleep and Grandma would say "Levántate (get up) the devil is not going to let you sleep."

Tracie's response: "Por todo las generaciones, Católicoismo." (Through all the generations, it was Catholicism).

Historians document that the presence of curanderas along Southwest borderlands became widespread with the prominence of Teresa Urrea and Mercedes Peña Lane. Evidence of their health practices along the Texas, Arizona, and Northern Mexican borderlands in the late-nineteenth and early-twentieth centuries can be found in local public records, documents and newspaper sources. A renowned healer in the southwest, Teresa Urrea (also known as la Niña de Cabora) was born on October 15, 1873 and raised on a hacienda in Cabora, Sonora, Mexico. She was partially held responsible for uprisings between villagers in Tomóchic, Chihuahua, Mexico against the government of Porfirio Díaz and exiled to the U.S. in 1892. Teresa made her home in El Bosque, Arizona where "this place became the Mecca for pilgrims seeking cures from as far away as Sinaloa. Not only the sick and crippled came, but political refugees as well." Then, "in the 1930s, in the South Texas towns of Kingsville and Bishop, a curandera developed an unusual practice among Anglos." Known as "Mother Lane," Mercedes Peña became a widely known curandera whose "patients traveled from across Texas and from other states in the U.S., Mexico and Canada to seek her help." Both healers, as young girls, were stricken with illnesses followed by dream-like experiences in which they heard voices. Shortly thereafter, Teresa and Mother Lane discovered they were both able to help others. The popularity of these two curanderas and the acceptance of alternative health practices did create problems and contradictory attitudes within the medical field. Yet, despite the attacks and generalizations about curanderismo, the custom continues to be practiced in the twentieth- and twenty-first centuries. I asked the García curanderas to explain why they thought people continued to pursue their services.

Q: Why do people continue to use curanderas?

Mercy's response: "This has been going on before…before Jesus walked the earth, and this is what He gave us to heal ourselves, and, one day, guess what? We are going to go back to basic stuff that He actually gave us. We are destroying our own environment. Look at the Amazon, it has so many medicines that they could offer us, yet we are destroying it. Something, for cancer [the cure for cancer] it's out there in the Amazon, but people are destroying the Amazon and we are not doing anything about it. One day I was walking with my mother outside and I said "mom, why don't you cut all these things out, these weeds?" She goes, "well for you it's a weed, for me too, but if you actually look at that," she goes "many people don't know this, but you see this weed right there, that weed, if you boil it and you're pregnant, you can actually have an abortion." I'm like, "what?" And it's right there? Just like that? And if you turn this way and if you see that weed, it's not a weed. That weed has vitamin C. It's good for people who are deficient in vitamin C but a lot of people don't know that…Little things like that we need to teach our kids, because our generation all they do is play video games and TV, and we can be teaching them something as easy as that, just simple things like for a simple stomachache."

Bonita's response: "People believe that since the hospitals don't want to touch the natural healing part, because they figure that technology has surpassed every-

A statue of Our Lady of Guadalupe protects the family garden. Ironically, an Easter bunny is on the left hand side of the Virgin Mary, a reminder of the coalescence of Mexican and American cultures.

thing. Sometimes you have to look back at what the basics were, when people were growing up, how did they survive? In the beginning of the ages of the world, is through, you know, uh, herbal stuff, natural things and some of the people believe that sometimes you have to start at the basics, and, you know, instead of sticking me with needles, maybe we need to go back to the simplest forms, which is, just, you know, natural healing."

The role of Mexican American women who practice curanderismo in the American public reveals that cultural traditions persevere despite modern advancements. Women have been the center of faith and tradition in their family life in preserving religious practices in the home as demonstrated by the curanderas in this research. In the words of historian Mario García, "the role of grandmothers and mothers in keeping the faith alive through various forms of popular religion in the home and in the community is a further indicator of lay leadership and historical agency." The social positions of García curanderas further demonstrates how they sustain their tradition and culture in the arena of their home, community, and city with change over time.

HEALING PLANTS

In the García family home, several statues of Our Lady of Guadalupe, the patron saint of ethnic Mexicans, are found throughout the gardens. Inside the home, makeshift shrines of the Blessed Mother are dedicated and adorned each day with fresh flowers. Home altars are very much a part of Mexican Catholic culture and during the time I spent in the home of this family of curanderas it was obvious that religious symbols and garden interaction played a large role in cultural identity. Plants of every assortment, as well as religious statues, were found throughout the gardens. Tending to her fabulous jardín (garden) of herbs and plants is a daily ritual for 70-year-old Tracie. Amidst the multitude of flowers, she grows an assortment of exotic fruits including papayas, figs and mangos. Among the powerful sábila (aloe vera), hierba buena (yerba buena or mint), and other medicinal herbs and plants, a magical, spiritual aura is felt. During a home visit and interview, I posed the following questions to Tracie about God, her garden, and plants.

Question: "Do you feel close to God in your garden?"

Tracie's response: "Claro que sí. Me siento bien cerca [a Dios] porque yo siento cuando estoy en mi jardín, yo siento que alguién esta detrás de mí, protegiéndome, porque yo tengo mucho miedo a las víboras, ¿verdad? Entonces yo le pido a Dios, pero yo siento que hay un angel cerquita y nomás he visto una víbora nomás una vez y desde que yo le pedí que no quiero ver animals feos, ¿verdad? como son, víboras peligrosas…" (Of course. I feel very close [to God] because I feel when I am in my garden; I feel that someone is behind me, protecting me because I am very afraid of snakes, right? Then I pray to God, but I feel that there is an angel nearby and I have only seen a snake only once since I prayed that I don't want to see ugly animals, right? Like dangerous snakes are…)

Question: Do you speak to God or your plants? Or, are the two separate?

Tracie's response: "Look when I go out to my garden, first I give salutations to God, and then I tell Him good morning. Then I speak to my plants, I tell them, don't be lazy, why haven't you given me a flower? Look, why haven't you given me fruit? Look how beautiful you are, but what good are you to me? It doesn't take before long that it starts to flower and bear fruit. When you have a conversation with a plant, it's exactly like you. It dies exactly like you. If you don't take water you can die. Just like if you don't drink water you can die. So, we are the same, but different in that they don't talk, but they show you how to talk."

CURANDISMO ACROSS THE GENERATIONS

While there is extensive scholarly research about curanderismo across regions with high Hispanic populations, there is still room for expansion on Mexican American women who cultivate what has been traditionally passed down from generation to generation. Chicanas are considered the holders and harvesters of home life responsible as for safeguarding tradition and cultural knowledge. Practicing curanderas teach their daughters how to recognize their "don" or gift, and take responsibility for teaching them folk healing techniques. Below are the responses of two of the interviewees when asked about the art of folk healing being taught across generations.

Bonita's response: "If you are born in a house where you were born with the gift, you know it's real hard to get away from it, and you just continue exactly what it is that you've known all the years, you know…it's more of a family thing."

Mercy's response: "I believe it is from generation to generation…others have it and don't want to, but they still practice it. From us, it is on the women's side; I think it is more from generation to generation. When I say I saw


A table is adorned with candles and a decorative filled with holy water and limes to ward off evil and any negativity that a client may bring into the home. Water and candles are considered sacred objects and culturally significant.

Marvelous plants fill the sacred family garden. Here, sábila (aloe vera) and other herbs are grown.
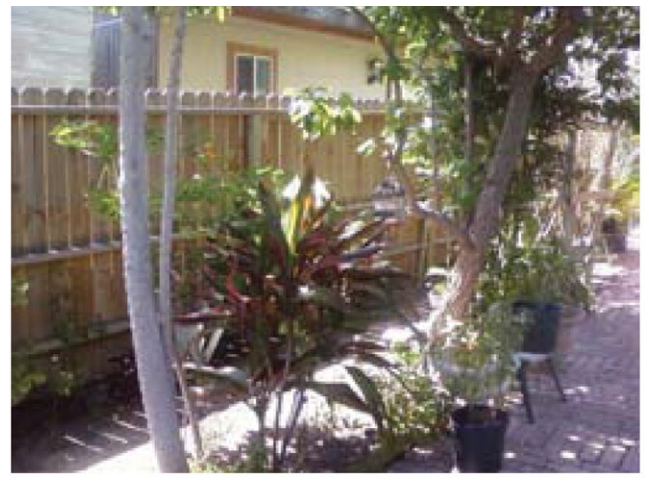
things, and if I explain it to somebody what I saw they would say, they would look at you and say, that's not possible. It is not only me; my sister has seen things too. Yet, we look at each other and say, "Did you see that?" And the weird thing about it is that our kids see it, like Megan, she sees it, she'll see your aura, and she's only seven years old. She'll close her eyes and she'll look at you say "oh, you're pink today, your aura is pink." And she's like "Why can't you see auras?" "Can't you see mine?" It's like I could if I really tried, but hers… she says that it's her powers, my little niece…and she's not the only one, we have another one that is the same way."
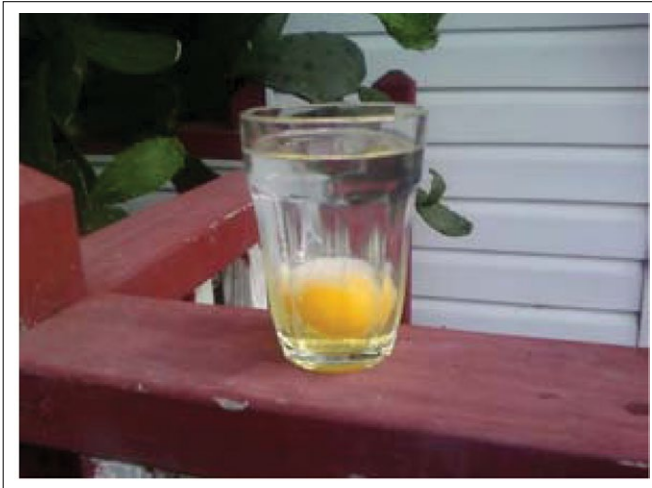
Mercy cracked this egg and dropped it into a glass of water after she treated a child for a case of "mal ojo" or the "evil eye." The child became ill after a person who admired him failed to touch him. The child had fever, headaches and drooping eyes. After the treatment, the child was up within 30 minutes asking for something to eat.

"THE PEOPLE WHO COME"

The clientele or people who seek the help of these four women come from all social, economic, and racial classes. In many instances, the García curanderas are often the first line of contact within Hispanic family and community networks for medical treatment. Still, many others reach out to this family of curanderas when all other remedies or medical treatments have failed and they don't know where else to turn. "The people who come" are in search of a cure or some type of relief

for their particular conditions. In these instances, the curanderas make it known that their services and treatments are not meant to replace or to be exchanged for any Western medical treatment they may already be receiving from a physician. The Garcías do not keep written documentation on the number of persons they have helped over the years, but they do note that at least two people per week ask for services and consultations. Nevertheless, from time to time, the curanderas have refused to share their healing gifts with particular individuals because of health or safety concerns while practicing curanderismo. The risk of encountering bad spirits and of upsetting people because a healing session may not work for them, are often reasons these curanderas will decline a "job." When these risks become apparent, the curanderas will end the consultation. As Mercy put it, "bad things could happen to you if you don't protect yourself."

Question: Why do people go to curanderas?

Bonita's response: "Well, I guess people go to them because, like I said it's been passed down from generation to generation, that it is something common that you do in order to get healed from uh, being sick, being scared, or whatever the case may be, because that's what was always the way that tradition has brought you up. Even in a Hispanic community, that is the first person instead of the doctor that is thought of, that's the first person that you think, oh I'm sick, go to her, she'll help you out. You know, and that's how it's always been. But, this is now. Back then, it's because they didn't have a choice. They didn't have a doctor nearby and people were poor in Mexico and that's where it basically starts out is over there in Mexico and our heritage just basically brought it over here to the United States."

Mercy's response: "First of all it's your cultural. You grew up hearing about it; your parents probably even practiced it."

Question: "What would you say are the economic and social affiliations of those who seek curanderas?"

Mercy's response: "They come from all walks of life, all races. You don't even have to, I mean, you think the Mexican people are more in to the herbs and curanderas. No. You should see, white people are worse, or more, and Black people are the same, because we have

friends that are both white and black. And, even the Koreans, you know. So, believe you me, it doesn't matter what color skin you are. It doesn't."

Question: Have you ever turned anyone down for any reason?

Bonita's response: "Yeah, there have been people that I've turned down. People that want monetary gain. Or, want some spell put on them. We, we don't do stuff like that. What we do mostly is we try to help you get yourself better. You know, clean your aura, or you know, make sure you just move through life in a better place instead of just trying to be placed all the way backwards, you know. Uh, and what we try to do here is try to make I guess, make people's auras – spirit feel a lot better so you won't get sick down the road."

Question: So, what does the practice [of curanderismo] involve?

Bonita's response: "It involves and it entails a lot and it's different curanderas. Curanderas try to help you, like I said, with mostly herbal stuff, with helping you get better, you know, healing powers, cleaning your aura, you know, and its mostly stuff that has been passed generation to generation. And then you have black [magic] and then there's white magic. If you are going to choose to do evil, then you'll do evil with it, but there's different kinds out there. And, you have different religions, like the Santería, there's people that practice Santería where they, you know, kill a certain animal and sacrifice it to a certain saint and uh, they go out to the beaches…Here as a matter fact, they practice here in Corpus Christi…people use the healing power of the water in order to get their strength, and the moon, and they offer all of

these fruits and stuff like that offerings to the sea. There is just so many different kinds of curanderismo, uh certain religions that you can practice…but, like I said, with our family here, we do have psychic abilities. Only a couple of us do, not everybody. I kind of tend to use it a lot more because my other sisters are kind of scared of it. They try not to practice anything and as far as me, I try to keep it here in the family. I don't go out in the neighborhood and you know advise people of what I do or anything like that, it kind of just stays here."

CONCLUSION

The practice of curanderismo is neither dying nor slowly disappearing. In fact it is enduring, surviving, and thriving through families giving birth to the next age of healers, as demonstrated in this one family of curanderas. This examination of these four women is an excellent illustration of how curanderismo has crossed multiple generations and borderlands of migrations from pre-Columbus to present-day. By claiming their rightful public space in the Molina barrio, the García women have become part of the social, political, and economic fabric of the city. Generational differences, religion, heritage, and a clientele who believe in holistic healing are all factors of why the practice of curanderismo still exists. Presently, Corpus Christi boasts a number of herbal remedy shops open and ready to supply the items needed and used by curanderas and curanderos in their holistic healing practices. Some products sold include talismans, amulets, spell bottles, candles, oils, and complete homemade altars. If the item needed for a spiritual healing is not found, Bonita and Mercy, the younger curanderas in this research, advised that one only has to "google" the words "curandera products" on an Internet page. A search engine will list at least five pages of websites to refer to and make a purchase. Additionally, it is not uncommon for the local newspaper, The Caller-Times, to print community bulletin board notices in the "Home and Garden" section about an upcoming meeting, workshop, or seminar. On March 21, 2009, the newspaper announced a "curandera seminar" entitled "The Curandera's Garden–Fact & Folklore." A local curandero and curio-shop owner hosted the seminar at the South Texas Botanical Gardens & Nature Center, near one of the most affluent, suburban neighborhoods in the city. The botanical garden also sold "typical food and medicinal plants historically grown in

A family of healers: Tracie, age 70; Mercy, age 40; Abuelita, age 98; and Miranda, age 2.

Mexican gardens." The seminar cost $6 per person and reservations were recommended.

This study has established that, despite all modern medical technological advances, Mexican-American curanderas have preserved the appeal and purpose of their holistic healing practices over several generations. Historian Vicki Ruiz said it well when she wrote "Mexican Americans have forged a place for themselves, while preserving their inherited traditions, including the use of folk medicines." Abuelita, Tracie, Mercy, and Bonita, by choosing and continuing to practice their don, have claimed their rightful public space in Corpus Christi and they intend to maintain it well into the twenty-first century by passing the tradition to their granddaughters.

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CONTRIBUTION OF THE STRESS HORMONE TO THE PATHOGENICITY OF *NEISSERIA MENINGITIDIS*

by LAURA E. VILLALOBOS

ABSTRACT

Neisseria meningitidis (Nm) may colonize in the oro-naso-pharynx without causing disease. It spreads person to person via respiratory droplets; however under certain conditions the bacterium can infect the mucosal epithelial cells and then cross into the bloodstream, resulting in septicemia. The exact nature of this process is not fully understood. It may subsequently cross the blood brain barrier to infect the central nervous system. Previous studies from Dr. Lillian Waldbeser's laboratory, suggest that stress may be a contributing factor to Neisseria meningitidis. Other reports demonstrate the correlation of stress with the severity of bacterial meningitis. Cortisol is a major stress hormone which activates metabolic processes in the body in response to elevated stress levels. This investigation aims to study the effects of cortisol on the pathogenicity of Nm, with special emphasis on the growth and morphology of the bacteria.

INTRODUCTION/LITERATURE REVIEW

Neisseria meningitidis is a major threat to human health and is a leading cause of bacterial meningitis and death in both developed and developing countries (Bentley, 2007). It consists of serogroups A, B, C, Y and W-135. Each serogroup is predominant in various locations of the world and is responsible for sporadic outbreaks, endemic occurrences, and focal epidemics (Figure 1.2). *Neisseria meningitidis* is a heterotrophic gram-negative diplococcal bacterium (Ryan, 2004). This bacterium opportunistically colonizes the mucosal, non-ciliated columnar cells of the human oro-nasopharynx, resulting in a 10-15% carriage in the population (Bentley, 2007). Approximately 2,500 to 3,500 cases of *Neisseria meningitidis* infections occur annually in the United States, with a case rate of about 1 in 100,000. Children younger than 5 years are at greatest risk, followed by

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FIGURE 1.1 Neisseria meningitidis shown through scanning electron micrograph (University of Wisconsin).

teenagers of high school age (Health, 2004). The CDC also includes college freshmen in dormitories as an at risk group for contracting bacterial meningitis. College freshmen living in dormitories have a seven times higher risk factor for developing meningococcal infections according to studies, since 1998, and the CDC (College freshmen, 2009). However, Dr. Waldbeser's study showed that stress and low immunity are the contributing factors toward increased carriage (Waldbeser, 2006). The bacterium is spread from person to person via respiratory droplets. Some strains of this bacterium have the potential to infect cells of the nervous system for humans. This is accomplished by the bacterium, spread via person to person by way of respiratory droplets, crossing the mucosa into the bloodstream and invading host cells, resulting in bacterial meningitis. (Bentley, 2007; Broome, 1986; Harrison, 1999; Waldbeser, 2006). The bacterium typically enters the body by colonizing the upper respiratory tract and hiding in low oxygen areas (Bauman, 2006). Subsequently the bacterium may invade the mucosa epithelia and progress to the blood stream and then cross the vascular endothelium, resulting in septicemia. It is disseminated via the vascular system, and it may cross the blood brain barrier to infect the central nervous system, resulting in bacterial meningitis, which is the inflammation of the meninges. The bacteria can often be isolated from the cerebrospinal fluid that protects the spinal cord and the brain (Bauman, 2006; Mullins, 2006).

Bacterial meningitis' pathogenicity includes the inflammation bacterium *Neisseria meningitidis* to adhere to host cells (Waldbeser, 2006). The level of cortisol (Figure 1.3) has been reported to correlate with the severity of bacterial meningitis (Freestone, 2008; Morand, 2004; Parker, 2004; Woensel, 2001). Cortisol is a major stress corticosteroid hormone produced by the adrenal cortex, part of the adrenal gland (Figure 1.3). It is the most potent corticosteroid and is vital in sustaining life. It helps the body cope more effectively in times of stress and anxiety by increasing blood sugar, blood pressure, and reducing immune responses (De Weerth, 2003; Lewis, 2007). Cortisol has diurnal variation, as well as individual variations, in which levels are higher in the morning than in the evening. Normal values in the human body range from 5-23 mcg/ dl in the morning and 3-13 mcg/dl in the evening. Conditions that can lead

FIGURE 1.2 Distribution of predominant N. meningitides serogroups (A, B, C, Y and W-135) (Canada Communicable Disease Report).

FIGURE 1.3. Chemical Structure of Cortisol (Sigma-Aldrich)
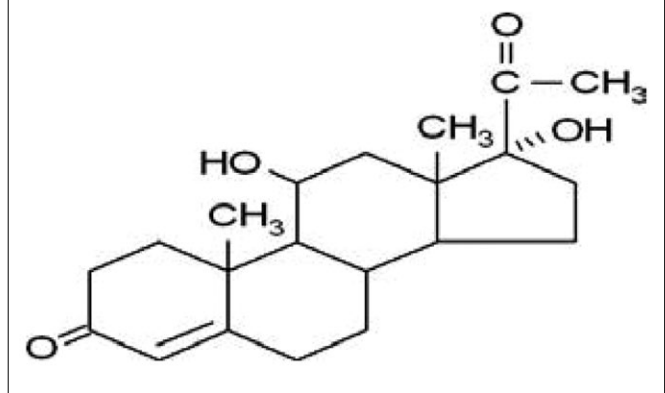
to higher levels of cortisol include Cushing syndrome, pancreatitis, and stress; and lower levels are contributed to adrenal insufficiency and panhypopituitary states (Lewis, 2007).

This investigation seeks to demonstrate the relationship between stress and bacterial virulence. The specific aim is to demonstrate that cortisol enhances the growth of *Neisseria meningitidis* and alters the phenotype of the bacteria.

HYPOTHESIS

Cortisol augments the growth and changes the morphology to that of a more pathogenic *Neisseria meningitidis*.

METHODOLOGY

Frozen Plate Sample

The workbench area was sterilized and the sterile flame procedure was used for frozen plate sample. Removed GCB plate from refrigerator and allowed it to warm to room temperature and marked with initials, date, and bacteria culture. The frozen bacteria culture was placed on ice at workbench. A small amount of the frozen sample was removed with a 1ml pipette and it was transferred to a GCB agar plate. The plate was swabbed with a sterile cotton swab and covered the entire plate. The plate was then placed in a candle jar, with its side down and with a lighted candle inside it. The plate was allowed to grow in the incubator for 18 hours at 37°C in a CO_2 environment.

Gram Stain Procedure

A slide with bacterial smear was placed on staining rack and was then stained with crystal violet for 1-2 minutes and the liquid poured off. The slide was then flooded with Gram's iodine for 1-2 minutes and then poured off. Slide was washed with acetone for 2-3 seconds to be decolorized and was then immediately washed with di-ionized water to remove acetone. Next, the slide was flooded with counter stain safranin for 2 minutes and then washed with di-ionized water. The slide was then blotted and dried over the bunson flame. The slide is then viewed under the microscope.

### N. meningitidis Growth and Cortisol Treatment

N. meningitidis was plated for 18 hour growth on GCB agar in CO_2 environment at 37°C. Bacteria sample was transferred into 1ml GC broth. Initial cell count was obtained by using a spectrophotometer at 600nm. Serial dilution was performed to obtain approximately 100,000 cells per 10μl. The 10μl of cell solution (1x105 bacteria) was transferred to wells containing 990μl of GC broth. Wells consisted of 1mL total of a broth control, DMSO control, Cortisol 50ng, 100ng, 1μg, 20μg, and 60μg. 24- well plates were incubated in CO_2 at 37.5°C for 14 hours. Final cell count was obtained by using spectrophotometer at 600nm.

N. meningitidis Morphology Detection

 Neisseria meningitidis was treated as above for 4 hours and plated at specific dilutions of 1000 cells, 100 cells, and 10 cells. Morphology of colonies was recorded photographically. Cellular morphology was examined by light microscope and recorded photographically.

RESULTS

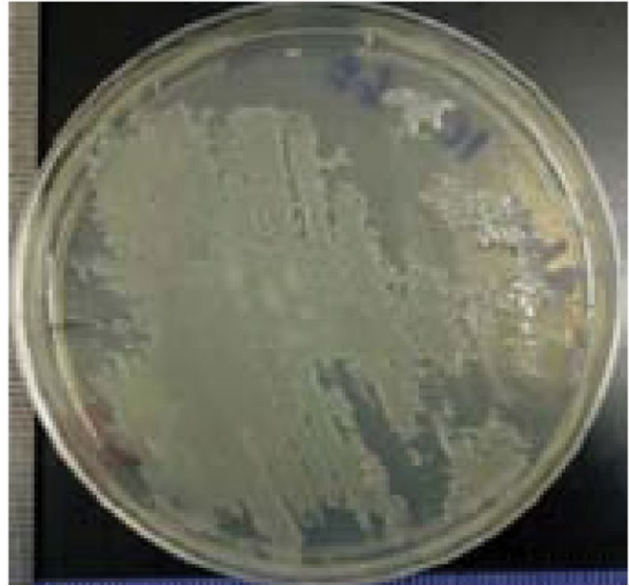GRAPH 1.1 Effect of Cortisol on N. meningitidis Colony Growth
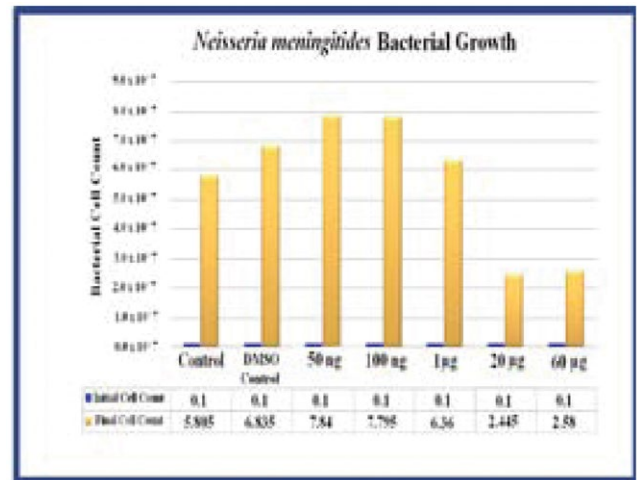
Bacteria cell count pre-cortisol and 14 hour post-cortisol treatment.

PHOTO A. Control Plate Exposure Photo B. Control +

PHOTO C. 50ng Cortisol Exposure
PHOTO D. 100ng Cortisol Exposure

DMSO Exposure

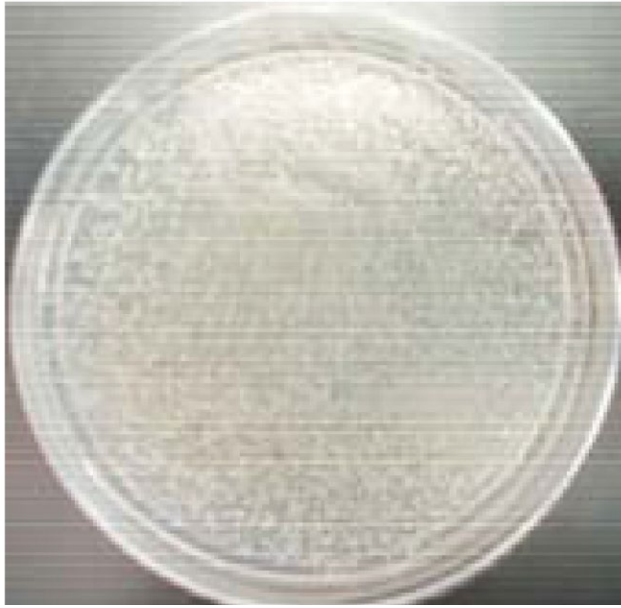PHOTO E. 1µg Cortisol Exposure
PHOTO F. 20µg Cortisol Exposure

PHOTO G. 60µg Cortisol Exposure

FIGURE 1.4. (Above) Photos A-G show plate growth after 14 hour exposure at 37.5°C in a CO_2 environment.

Photo A is a Control with no exposure. Photo B is a Control with DMSO showing the lack of effects the DMSO has on the Nm. Photos C and E show growth with varying levels of cortisol, correlating to levels found in the human body under stress. Photos F and G show growth with cortisol levels that are above the normal range found in the human body.

FIGURE 1.5. Nm Control.
Normal diplococcal development. (100x)

FIGURE 1.6. Nm treated with 20ug cortisol. Change in shape (round to oblong) and an appearance of a capsule. (100x)
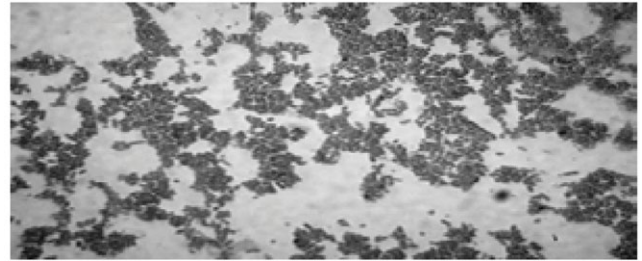
DISCUSSION

For a given initial number of bacteria, overnight incubation with cortisol yielded a significantly higher number of bacteria than the controls. This result indicates that cortisol augments the growth of *Neisseria meningitidis*. The stimulation of growth in Nm may contribute to the virulence of the bacteria in the human body. This can allow the bacteria to become septicemic, accessing areas of the human body it may not normally proliferate to. A significant change in morphology was seen on plates when *Neisseria meningitidis* was exposed to cortisol treatment. The bacteria no longer produced individual colonies, instead they seemed to produce a "slime" type layer radiating from the initial colony. The changes seen in cellular morphology are significant. This is possible evidence that cortisol alters bacterial phenotype expression and possible gene expression. The changes in morphology from normal to "slimy" suggest that cortisol may up-regulate the expression of capsular polysaccharide. Up-regulation of this gene indicates a potential receptor for cortisol, or a receptor that allows cortisol to be transported into the bacteria through the cell membrane. Staining shows a potential capsular formation around the bacteria, along with elongation of the cellular structure. This may potentially be the cause of the slime type layer seen with growth on GCB plates. The combination of results seen in this project is highly significant in understanding the role played by cortisol in *Neisseria meningitidis*' virulence and pathogenicity.

FUTURE RESEARCH

Future experiments include mRNA, reverse transcription, and quantitative PCR for expression of the pilC gene which encodes for adhesion, and the ctrA gene, which encodes for an outer membrane protein involved in capsule formation. Cell adhesion studies with epithelial cells will be performed in order to find a link between the new gene expression due to cortisol and adhesion within the human body.

ACKNOWLEDGEMENTS

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2010 McNAIR RESEARCH ARTICLES

RECOGNITION MEMORY AND MEDITATION: COUNTERING THE INFLUENCE OF STRESS

by MEGAN CRAWFORD-GRIME

ABSTRACT

This study compared the word recognition performance of three groups of participants who were given either guided meditation, clinically standardized meditation, or no meditation (control group). The use of meditation was to test the hypothesis that when the emotional and physiological state at memory encoding approximates the emotional and physiological state at memory retrieval, memory performance is enhanced overall10. Research suggest that meditation, regularly practiced, can relieve stress symptoms4. Participants attended two 20 minute sessions that presented one of the three techniques. Immediately after the second session, all participants were presented with the same list of 64 neutral words to be memorized. One day later participants were asked to identify the 64 original words from 64 new words as quickly and as accurately as possible. In order to produce a successful recreation of the stress-levels normally experienced in a typical university exam environment, we exposed the participants to physiological, behavioral, and cognitive scrutiny. On average, the clinically standardized meditation group reported experiencing the highest amount of stress during the testing session (M = 31, SD = 16, respectively) and showed the highest recognition accuracy rate (69%) compared to the guided meditation and the control groups (64% and 64%, respectively). All three groups responded to the old words quicker than to the new words. The control group, however, responded faster to the original words (1238 ms) compared to the guided meditation and clinically standardized groups (1467 ms and 1510 ms, respectively). Primed by condition (guided meditation, clinically standardized meditation, or no meditation) reaction time approached significance [F(2,29) = 2.39, p = .11]. This study has implications for students with lower memory performance on exams as a result of elevated stress. The practice of focus and relaxation from meditative techniques may work to lower stress levels at exam time. This in turn may help to better match the stress level typically experienced during periods of study resulting in enhanced memory performance.

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INTRODUCTION

Memory

A major challenge for college students is the ability to perform successfully on tests. Testing poses a challenge because it raises the level of stress, emotionally

and physiologically, in the student (Folkman & Lazarus, 1985; Lazarus, Deese & Osler, 1952). The stress experienced in the testing environment is incompatible with the more relaxed environment that is typical with studying. The incompatible states at study (memory encoding) and at test (memory retrieval) may be detrimental to memory performance (Eich, 1995; Waddell, Mallimo & Shors, 2010).

Eich's (1995) investigated the influence of congruent versus incongruent emotional states at study and test. Eich induced a pleasant mood in half of his participants and an unpleasant mood in the other half before asking them to generate 16 target words and read over 16 distractor words. Two days later, half of the participants were induced into the same prior mood while the other half were induced into an incongruent mood before their memory for the target words was tested. Memory for the target words was best when the mood at study was congruent with the mood at test regardless of the type of mood (pleasant or unpleasant). Eich termed this benefit of congruent moods on memory performance mood dependent memory (MDM).

Eich and Macaulay (2000) looked at whether simulated moods, compared to induced moods, produced mood dependence in a recognition test. The induced moods were perceived by most participants as having a high degree of affective realism. Results revealed that induced-mood participants showed significant impairment of test performance when moods were mismatched; simulated-mood participants showed no measurable impairment. Eich's and Macaulay's research concluded that stronger results could be measured from induced mood states.

Based on the results of previous work by Eich and associates (1995; 2000) and context encoding research by Erk, et al. (2003) and Erk, Martin and Walter (2005), we chose to explore the phenomena of induced mood results, as opposed to simulated moods, with encoding and retrieval of content neutral material. Inducing moods allows us greater access to the natural fluctuations of mental states (Bower, 1992). For example, these fluctuations can be observed in a student whose mood changes from the previous night's study session to the time of the exam. As the environment changes, so do the emotional responses.

The theory of MDM offers two hypotheses concerning the incongruence of a student's emotional state at study and test. First, if students studied under high stress levels similar to those experienced during test, exam performance should improve (e.g. Schwabe & Wolf, 2010). Second, if students were tested while experiencing low levels of stress similar to those experienced during study, exam performance should improve (e.g. Eich & Macaulay, 2000; Ellis, Moore, Varner, Ottaway & Becker, 1997; Macaulay, Ryan & Eich, 1993). This study focused on the latter. Our hypothesis is that students who can control their emotional state (i.e., lower their stress level) during testing will perform better on a recognition test than students who cannot control their emotional state during testing. Research into meditation has shown that regular practice can lower stress levels (Carrington, et al, 1980; Collings, 1989; Lutz, Dunne & Davidson, 2007; Rausch, Gramling & Auerbach, 2006).

Meditation

For the purposes of this study we chose to focus on two styles of meditation: Guided and Clinically Standardized (Carrington & Ephron, 1978). The Guided meditation (GM) was modeled after the Vipassana style of meditation and was selected to teach participants how to assess their external environment, their place within the environment, and awareness of their mental states in response to the environment, thus incorporating both physiological and psychological relaxation (Halsband, Mueller, Hinterberger & Strickner, 2009; Mark & Williams, 2010).

GM sessions began with emphasizing physiological relaxation by instructing participants to close their eyes and focus on their breathing. Physiological relaxation was further emphasized by exhaling and terminated with a minute in silence (Hart & Hart, 1996). The psychological relaxation was emphasized by asking participants to visualize themselves in an examination and to remain calm and focused.

To contrast the emphasis on physiological and psychological relaxation, the Clinically Standardized meditation (CSM) was selected because of an emphasis solely on a psychological relaxation. The CSM, modeled after Transcendental meditation, directs comfortably seated participants to utter a single syllable sound and sus-

tain it through an exhale. Using internal vocalization, participants mentally rehearse their utterance with their eyes closed. A control group received no meditative practice (NM).

This study tested whether matching emotional and physiological states for both memory encoding and retrieval through meditation would increase memory performance (Lutz, Dunne & Davidson, 2007; Mark & Williams, 2010; Reed, 1978).

Suggestibility

Though there has been extensive scientific work on measuring the effects of meditation on human behavior and neural mechanisms, there still remains many unanswered questions and ambiguous results in the scholarship related to this topic. This is in part due to the plethora of meditative styles and research criteria used to investigate and measure the effects (Lutz, Dunne & Davidson, 2007). Arguably, certain meditation techniques are blurred with hypnotic techniques within the general public (Wagstaff, Brunas-Wagstaff, Cole & Wheatcroft, 2004; Wagstaff, Cole, Wheatcroft, Marshall & Barsby, 2007). Typically, research into meditative techniques is based on mindfulness and hypnosis is based on suggestibility (Halsband, Mueller, Hinterberger & Strickner, 2009).

In regards to the practices of meditation and hypnosis, we refer to a passage from Eich (1995) where he states, "those who are most 'moved' by the [continuous music] technique show the strongest signs of both mood congruent and mood dependent memory." (p. 74). This strong response to the mood inducing technique observed by Eich (1995) tied closely with observed responses in other meditation and hypnosis research (Braffman & Kirsch, 1999; Erk, et al, 2003; Iani, Ricci, Baroni & Rubichi, 2009; Jamieson & Sheehan, 2002; Santarcangelo & Sebastiani, 2004). The observation of differing levels of emotional response to mood inducing techniques brought about two interesting questions: Is there a specific identifiable personality trait that could explain the strong emotional response to the meditative techniques? If so, would that personality trait correlate strongly with the higher test scores of the participants in our study?

The trait in question is a person's level of suggestibility. Kotov, Bellman & Watson (2004) describe suggestibility as a personality trait that shows a tendency to accept and internalize messages (narratives). The Kotov, et al (2004) study suggests that the higher an individual's level of suggestibility, the more likely one is to yield to messages and increase response to persuasive tasks. Differences in each participant's likelihood of being influenced by the persuasive narratives of the GM technique were anticipated by measuring each participant's level of suggestibility – as scored on the Short Suggestibility Scale (SSS) (modified from the Multidimensional Iowa Suggestibility Scale, MISS) – prior to the application of the techniques (Kotov, Bellman & Watson, 2004). This scale is a multi-dimensional measure of suggestibility that has significant correlations with the Stanford Hypnotic Susceptibility Scale (Weitzenhoffer & Hilgrad, 1962) in the areas of agreeableness, absorption, persuadability, sensation contagion, physiological reactivity, peer conformity, and the MISS scale in its entirety.

METHODS

Participants

Thirty two undergraduate students were recruited to participate in this experiment. All participants were English proficient with normal or corrected to normal hearing and vision. No participants reported excessive use of alcohol, tobacco or mind/mood altering drugs. Participants were compensated with free access to a local wellness studio and or class credit.

Stimuli

The stimulus for the recognition task included 64 to-be-remembered words selected from Tulving, Schacter & Stark (1982). They were neutral in character, low frequency, 6-8 letters in length, and 2-4 syllables. The 64 words presented during the second group session were randomly mixed with 64 new words that were matched based on frequency (4.8 wpm and 5.4 wpm, respectively), length (7.4 letters), and syllable count (2.7 and 2.6, respectively). All words were neutral in character in order to minimize mood-congruence between emotional content and context (Parrott & Spackman, 2000).

Procedure

Participants were recruited through in-class efforts during the Summer semester. Interested students

were then asked to fill out a demographic intake questionnaire and the Short Suggestibility Scale (SSS) (Kotov, Bellman & Watson, 2004).

The SSS consists of 21 questions taken from the larger Multidimensional Iowa Suggestibility Scale (MISS) with a Likert scale ranging from 1 (*Not at all/Very slightly*) to 5 (*A lot*). The final scores can range from 21-105. Participants are asked to score their likeness to a statement. As the participants turned in their surveys (within 10 minutes of receiving), each one was immediately rotationally assigned to one of the three groups. Assignment efforts were made to ensure an even representation of sex and number of participants in each group.

Each group met for two, 20 minute sessions in a week. Each session began with physiological measurements (BP/HR) followed by the meditation training (or mnemonic training for the NM group) and concluded with BP/HR readings.

Ten participants were assigned to the GM group and ten participants were assigned to the CSM group. The procedures for the two meditation techniques are described above. The sessions for the twelve participants in the NM group began with BP/HR, however, in lieu of any meditative techniques, the first group session discussed mnemonic techniques and the second session discussed kinesthetic techniques.

In the second session each group was presented with an identical list of 64 to-be-remembered words. The words were presented after BP/HR was recorded for the second time. Twenty-four hours later, participants were tested on the to-be-remembered words.

To induce exam type stress levels we exposed the participants to physiological, behavioral and cognitive scrutiny modeled after the Trier Social Stress Test (Kirschbaum, Pirke & Hellhammer, 1993). The participants first experienced an anticipation period where they waited in the hallway before entering the preparation lab. Immediately after their BP/HR readings were recorded three Electromyographic (EMG) sensors (physiological scrutiny) were attached to the flexor muscle of both forearms and one reference on the end of the ulna (wrist). After the application of the EMG sensors, participants were asked to perform mental arithmetic (2 minutes). They were asked to serially subtract the number 13 from a random 4-digit number.

For every correct answer participants were prompted to continue subtracting. For every wrong answer they were informed they had given the wrong answer, the mathematical question was repeated, and asked to start from the beginning again. After the mental arithmetic, all the participants were moved to the adjacent testing lab to perform the memory test. Participants were seated in front (approximately 70 cm) of a flat screen monitor connected to a Dell computer which generated the stimuli and recorded the response time (RT) and accuracy. As an impression of behavioral scrutiny a flip-screen digital video camera was placed at each testing station approximately 60 cm from the participant's face. Participants were then informed that they would be monitored through the two-way mirror on the opposite wall. Finally, as an impression of cognitive scrutiny, participants were informed that their results would be reviewed and compared with others in the study to assess their individual memory skills.

Before the test began, participants were briefed on the testing protocol. The trials followed a set sequence of events. They were instructed to press one key with their right index finger if the word was part of the list presented in the second session - "old" word - and to press another key with their left index finger if the word was not part of the list - "new" word. Participants were encouraged to respond as quickly and as accurately as possible. The final instruction given to the participants, before exiting the room, was to take a moment to remember the techniques they worked on during the previous sessions and begin the test when they were ready. The test randomly presented the original 64 to-be-remembered words (old words) along with 64 matched new words.

Each trial began with a fixation stimulus (a *) presented in the middle of the screen for 500 ms followed by a blank screen for 500 ms. A word was then presented centered on the screen until the participant responded or until 3500 ms has passed. After a response was provided the screen cleared for 1000 ms and the next trial began automatically. The E-prime software v. 1.1 (Psychology Software Tools, Inc.) was used to control the sequence of events and the data collection.

After all participants in the room completed their tests, they were escorted from the testing lab back to the

preparation lab. BP/HR readings were recorded once more and sensors were removed. Participants were then asked to complete a student satisfaction survey. The survey consisted of nine questions: five questions measuring the stressful impact of the test, specifically the camera, two-way mirror, arithmetic, EMG sensors, and overall stress response; three questions measuring the impact of groups sessions, specifically relax response, helpfulness in testing, and likeliness to continue technique; one free response. Even though the final survey was presented as optional, all participants completed one.

As a final measurement, each participant's recognition accuracy score was compared to their individual suggestibility scores gathered from the SSS. These scores were compared to see whether the participant's propensity to suggestion positively influenced his/her recognition accuracy score.

RESULTS

Physiological responses to the group sessions were measured by systolic pressure, diastolic pressure and heart rate. During the group sessions, the GM group had the largest average decrease in both systolic and diastolic pressure (8% and 7%, respectively) whereas the CSM group has the smallest average decreases in systolic pressure and was the only group to show an increase in diastolic pressure (6% and 2%, respectively). The NM group had the largest average increase in heart rate (9%) whereas the CSM group has the smallest increase (0.66%). The meditation groups averaged less physiological stress than the NM group (see Figure 1).

Physiological responses to the testing sessions followed closely, by group, to the group sessions. During the testing sessions, the meditation groups combined (GM and CSM) showed less physiological stress measures (6% systolic, 2% diastolic drop, and 2% heart rate rise) than the NM group (5% systolic, 1% diastolic, drop and 9% heart rate rise: see Figure 2).

The recognition test allowed for 128 possible correct responses. RT greater than three standard deviations above the average were removed (without replacement). The number of outliers eliminated from the analysis was 1.7% of the total number of responses over the whole experiment. The average number of correct responses (for old and new words) and the average RT was calculated for each group. Overall, RT to the old words were significantly faster than those to the new words, [$F(1,29) = 22.88$, $p < .000$]. However, the magnitude of the old-new different was inconsistent across the groups. The old-new RT differences for both meditation groups were near 260 ms whereas the difference for the NM was 75 ms. The type (old, new) by condition (GM, CSM, NM) interaction approached significance [$F(2,29) = 2.39$, $p = .11$] (see Figure 3).

Despite the old-new RT differences, the accuracy to old words was similar to the accuracy to new word. In terms of overall accuracy, the CSM correctly identified the most items ($M = 85$, $SD = 13$) and the GM group correctly identified the least ($M = 80$, $SD = 6$), [$F(2,29) = .58$, $p = .57$] (see Figure 4).

At the end of the testing procedure, each participant completed a student satisfaction survey. A likert scale ranged from 0-100 in increments of 10 for each question, from 0 (*Not At All*) to 100 (*Extremely*). The first five questions covered their stress responses to the various testing elements. Overall, the CSM reported experiencing the highest amount of stress during testing ($M = 31$, $SD = 16$) and the GM group reported experiencing the least amount of stress ($M = 29$, $SD = 14$; bottom line of Figure 5).

The next three questions covered the emotional effects of the technique in which each group was engaged. The GM group reported feeling the most relaxed after the group sessions ($M = 77$, $SD = 19$), considered their technique the most helpful during the testing procedures ($M = 69$, $SD = 26$) and averaged the most likely to continue their technique after the conclusion of this research study ($M = 66$, $SD = 16$; top 3 lines Figure 5).

Finally, we looked at the participants' suggestibility scores from the first survey. The MISS has a strong, positive correlation with the Stanford Hypnotic Susceptibility Scale ($r = 0.29$, $p < 0.01$), the Gudjonsson Compliance Scale ($r = 0.46$), and the Maternal Social Support Index - Social Adaptability ($r = 0.45$). The SSS has a strong, positive correlation and reliability with the MISS ($r = 0.93$, $p < 0.01$). The SSS also has strong, positive correlations with the Gudjonsson Compliance Scale ($r = 0.48$) and the Maternal Social Support Index - Social Adaptability ($r = 0.45$). The SSS has a strong,

negative correlation with the Maternal Social Support Index - Principled Autonomy (r = -0.33) (Kotov, Bellman & Watson, 2004).

The overall suggestibility for the participants was M = 52, SD = 10. The GM had the highest average score, most suggestible, (M = 60, SD = 1.4), followed by the CSM group (M = 52, SD = 10.4), and finally the NM (M = 46, SD = 11). All three groups were within one standard deviation from the overall mean. The original sample of university students measured on the SSS (n = 1957) by Kotov, Bellman & Watson (2004) had a norm of M = 54, SD = 11. Though our sample was considerably smaller, the collective mean falls within one standard deviation of the original university sample. We ran each individual participant's overall accuracy, old and new, score against the original suggestibility score. From these results, we conclude that there is no significant correlation between the participants' level of suggestibility and their memory recognition performance. The comparative results are illustrated in Figure 6.

DISCUSSION

It was hypothesized that both of the meditation groups would have a greater relaxation response than the NM group. During the condition sessions the meditation groups averaged a greater decrease in BP/HR than the NM group. The GM group also self-reported feeling more relaxed after the group sessions than the CSM group and the CSM group self-reported feeling more relaxed than the NM group. During the testing procedures all groups experienced an average drop in BP/HR. The meditation groups averaged a greater decrease in systolic pressure and heart rate than NM group. The data support our original hypothesis.

The CSM group had the largest systolic pressure drop during the testing procedures and reported the most perceived amount of stress from the testing procedures. The CSM group accurately identified more of the old words, as well as total number of words. These results together suggest that the CSM group may have been able, through the teachings of their meditative technique, to recover from their initial stress-response quicker than the other two groups. Once stress is regulated in the human system, clarity of mind and focus is increased (Deckro, et al, 2002; Mark & Williams,

2010). It is possible that the CSM experienced this phenomenon through their meditative technique.

The NM group completed the recognition test the quickest and correctly identified the fewest number of words overall. The group also had the smallest decrease in BP/HR. The quick timing of the group's testing compared with their low accuracy suggests that the group may have traded off accuracy for speed. The low accuracy suggests that there may have been more guessing.

Finally, we looked at the suggestibility trait that was measured at the beginning of the experiment. As is illustrated in Figure 6, the scatter plot shows no line of regression and no significant correlation between personal level of self-reported suggestibility and recognition memory performance. From this we concluded that, in respect to our sample of participants, a person's level of natural suggestibility has very little impact on his/her ability to remember and recall information.

Because of our small number of participants, the results gathered and measured were not significant enough to support our original hypothesis. It would be interesting to see what a larger sample would yield, especially in the areas of attention and self-awareness. In future testing, not only would a larger sample be optimal, but also more group sessions. Reed (1978) and Lutz, Dunne & Davidson (2007) emphasized that the more a meditative technique is practiced, the more acutely the effects can be realized.

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FIGURE CAPTIONS

Figure 1. Average blood pressure (mmHg) and heart rate (bpm) changes for guided meditation (GM), clinically standardized meditation (CSM), and no meditation control (NM) groups from the condition sessions.

Figure 2. Average blood pressure (mmHg) and heart rate (bpm) changes for guided meditation (GM), clinically standardized meditation (CSM), and no meditation control (NM) groups from the testing session.

Figure 3. Accuracy rates for guided meditation (GM), clinically standardized meditation (CSM), and no meditation control (NM) groups of old and new words on the recognition test.

Figure 4. Reaction time for guided meditation (GM), clinically standardized meditation (CSM), and no-meditation control (NM) groups of old and new words on the recognition test.

Figure 5. Self report score means of perceived levels of relaxation after the condition sessions, how helpful each group considered their learned technique for the testing session, how likely groups are to continue their learned technique, and perceived stress during the testing procedures from the guided meditation (GM), clinically standardized meditation (CSM), and no-meditation control (NM) groups.

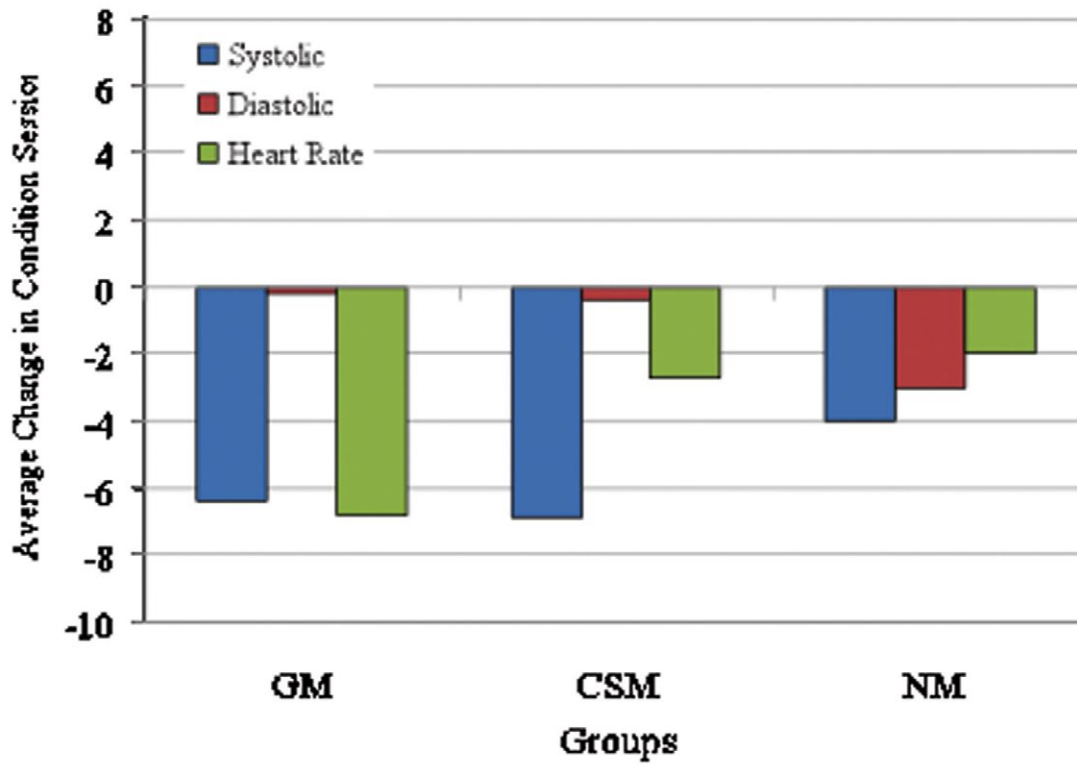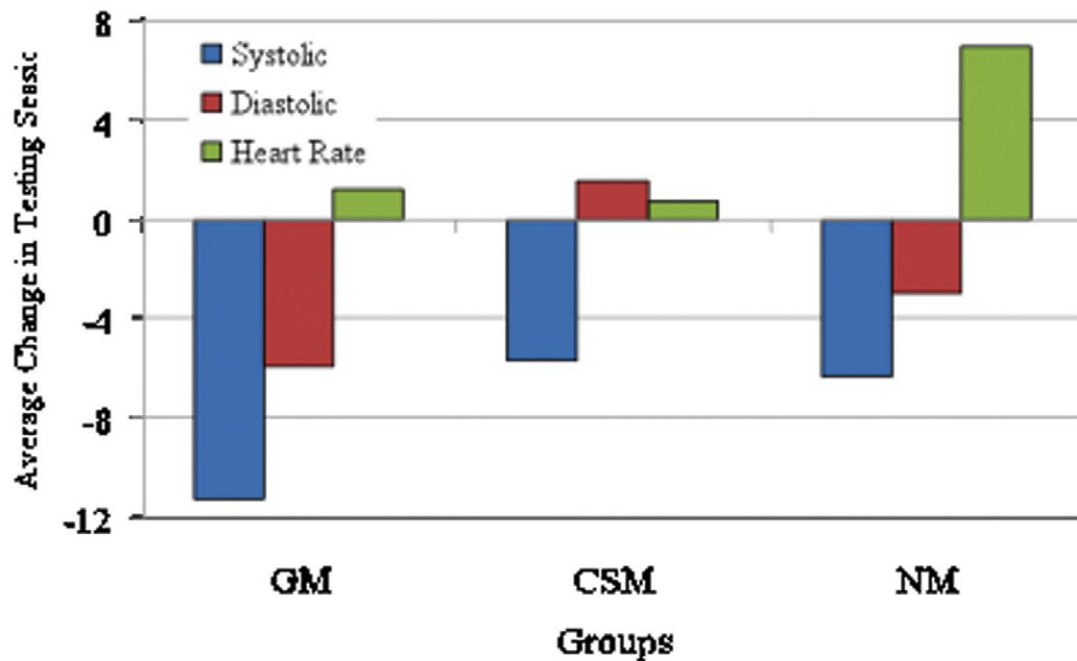Figure 6. Scatterplot of participants' individual suggestibility scores and overall recognition test scores.

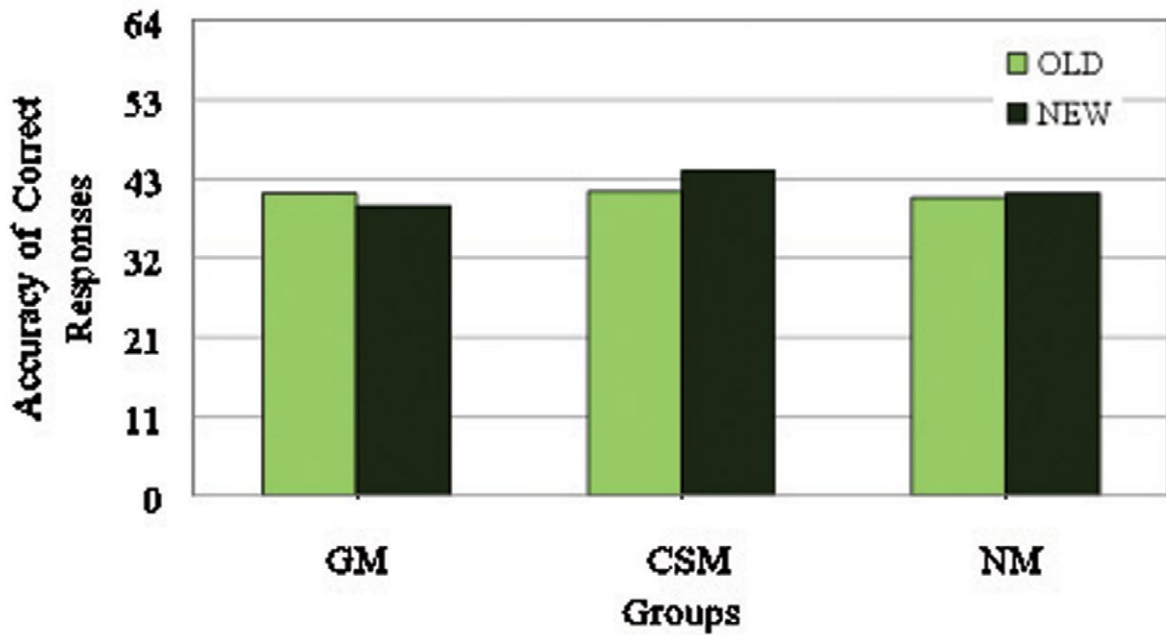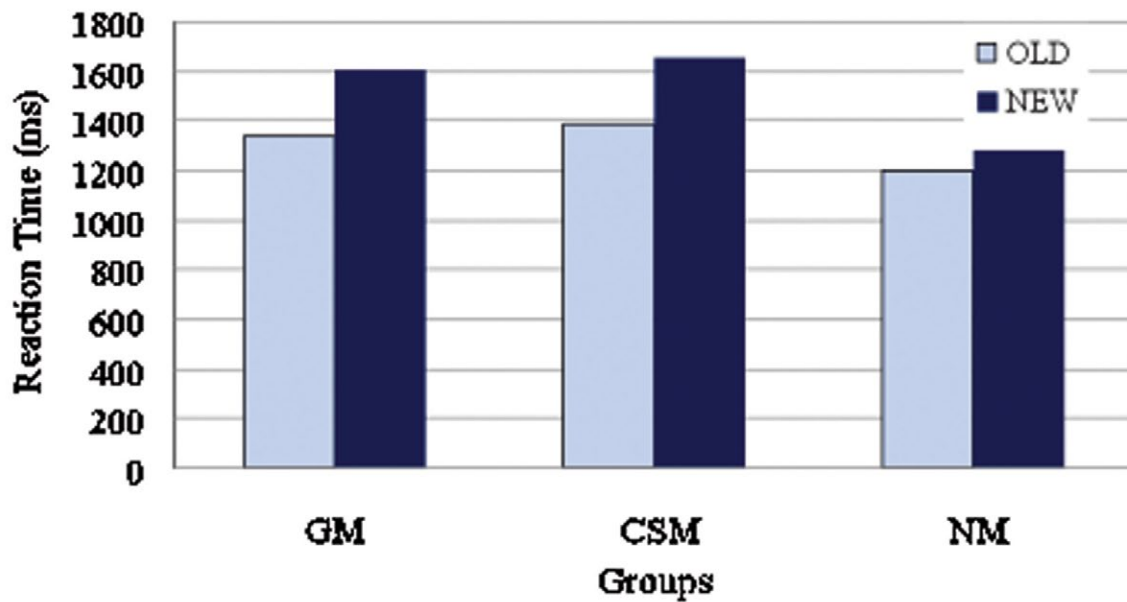## FIGURE 1

FIGURE 2

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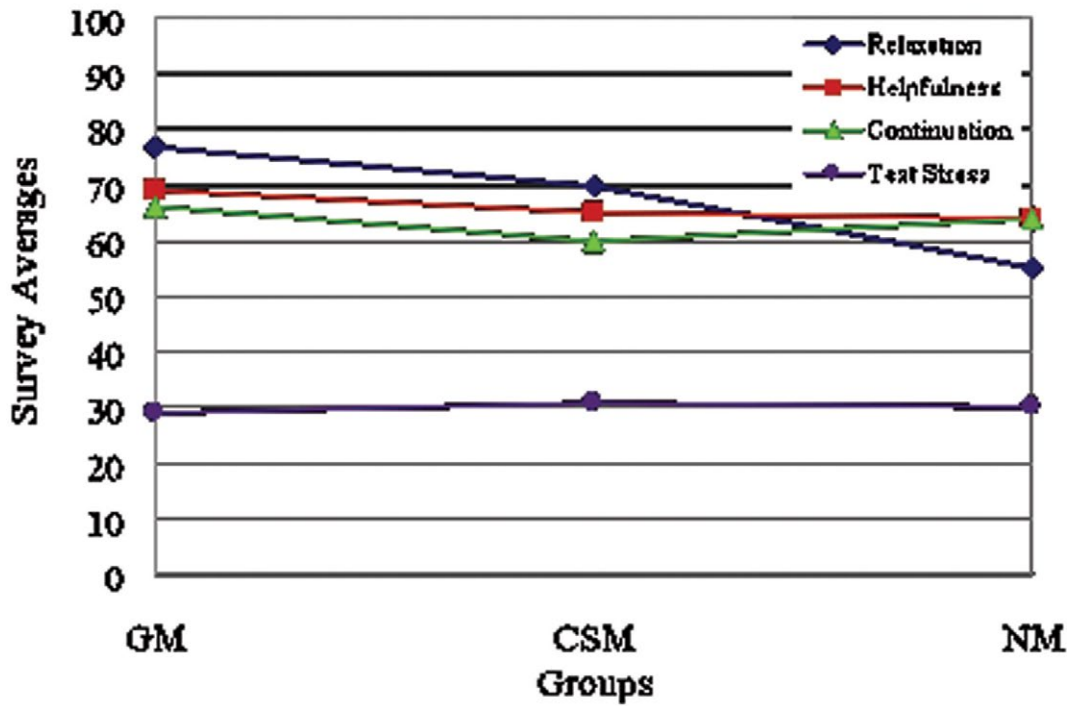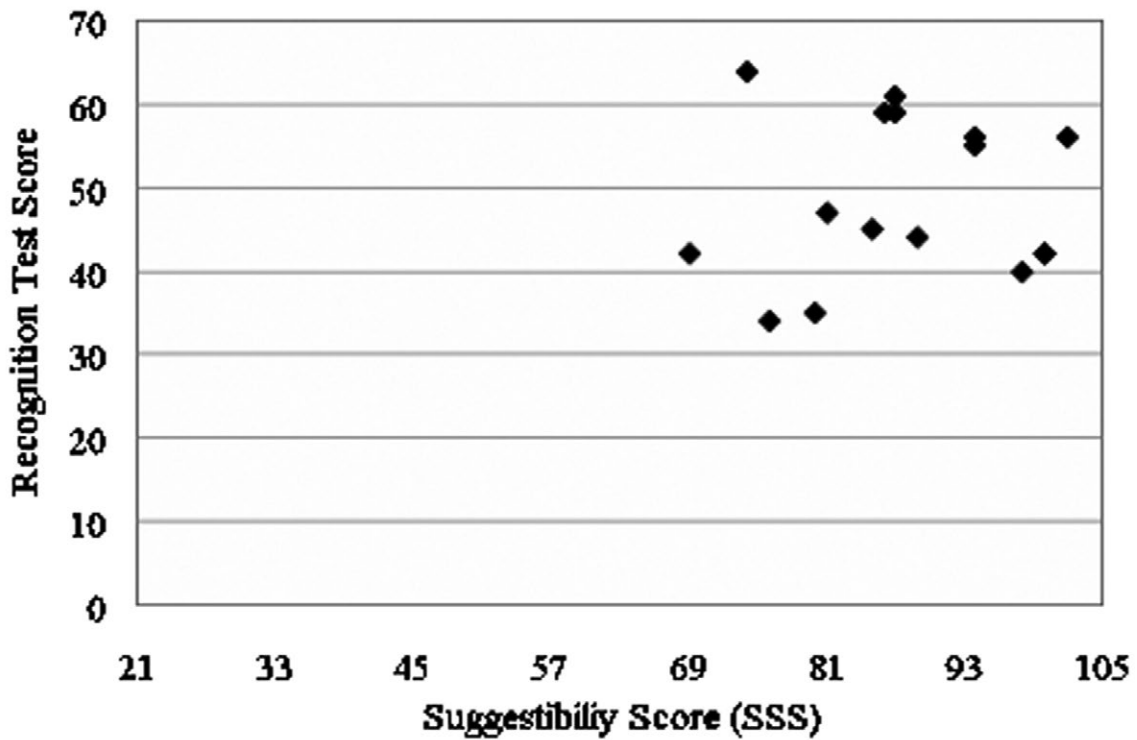

FIGURE 4

FIGURE 5

FIGURE 6

ACCULTURATION AND ATTITUDES TOWARD SB 1070: A STUDY OF MEXICAN AMERICAN COLLEGE STUDENTS

by AMPARO K. DÍAZ

INTRODUCTION

Since before Arizona Senate Bill 1070 (also known as Arizona House Bill 2162) was signed into law, Americans asked the Arizona governor to veto the bill, citing concerns of discrimination and possible biased enforcement. SB 1070 was signed into law by Governor Jan Brewer (Arizona) and seeks to diminish the presence of undocumented immigrants in the state of Arizona by requiring that law enforcement officers act as immigration enforcement agents. One single provision of the bill grants law enforcement officers the authority to question an individual's citizenship status during the course of a lawful stop, detention, or arrest (when practicable), as long as reasonable suspicion exists that the person is in the country illegally (State of Arizona 2010). This single provision has left many questioning the methods by which law enforcement officers are to establish reasonable suspicion. While some Americans

believe that the law infringes on civil liberties and constitutional rights and targets a specific group of people (those who appear to be of Mexican origin), others believe that the state-enforced law simply makes up for the federal government's lack of effort and success at securing the 2,000-mile stretch of land connecting the United States of America to the Estados Unidos Méxicanos (México).

Whatever the reason may be for the new law, it is undeniable that the bill has received widespread criticism across the country and the world. Like most Americans, those of Mexican origin appear to have variations in the degree of opposition to this public policy. Previous studies have linked Hispanic attitudes of public policies to variables such as age (Binder et al. 1997), minority status (de la Garza et al. 1993), educational attainment (Hood et al. 1997), socioeconomic status (Binder et al. 1997), and location (Hood et al. 1997). One other variable, and the most statistically significant, has been the level of acculturation of the individual being studied. Previous research suggests that acculturation is a reliable measurable variable which affects an individual's opinions and attitudes towards public policies (Branton 2007). Acculturation refers to the "phenomena which results when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of

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either or both groups" (Redfield et al. 1936). In this case, acculturation refers to the "Americanization" of Mexican immigrants upon contact with the dominant group, Anglo Americans.

Therefore, it is the purpose of this study to determine the relative effect of acculturation on the degree of Mexican American's opposition to SB 1070.

Arizona Senate Bill 1070

Arizona Senate Bill 1070 was signed into law by Governor Jan Brewer. Among other provisions, the bill requires police officers to verify an individual's immigration status for any lawful contact made, when practicable, if reasonable suspicion exists that the person is unlawfully present in the country (State of Arizona 2010).

In Arizona, the law has received criticism from the Arizona Association of Chiefs of Police, which claims that the new state-enforced law will limit their time to respond to local calls from residents in their respective communities. The organization asked Congress to begin working on a comprehensive immigration reform that balances the needs of the community and the enforcement of immigration laws (AACOP 2010). The Arizona Hispanic Chamber of Commerce also criticized the law, claiming that its effects will have a negative impact of the economic sector, adding that it is not fair nor humanitarian (AZHCC 2010). On May 29, 2010, an estimated crowd of more than 150,000 Americans marched five miles towards the state Capitol (Phoenix) in protest of the bill (Bernick 2010).

Beyond Arizona in the United States, the law has received criticism from many Americans in all spheres of life including music, academics, athletics, law enforcement, politics, religion, and civil and human rights. In music, Joe Rocha, lead singer of Rage Against the Machine (an American rock band), is the organizer of an artists' boycott of Arizona named "Sound Strike". In a letter he wrote to other artists seeking support Rocha claims the bill "legalizes and sanctions racial profiling" (Soundstrike 2010). He calls for a boycott of Arizona in defense of human and civil rights. The project has gained the support of more than 200 artists including American musicians Pitbull and Kanye West, Spanish pop star Juanes, and Mexican banda Los Tigres Del Norte (Sound Strike 2010). In athletics, the executive director of the Major League Baseball Player's Associa-

tion, Michael Weiner, issued a statement regarding the bill which stated that unless the law was repealed, the union would take additional steps to ensure the rights and interests of their players and their families. Because more than 25 percent of MLB's players are of Hispanic origin, it is important to ensure the safety of all players, and their families during their expected stay in Phoenix for spring training (MLBPA 2010). In academics, Alpha Phi Alpha Fraternity, one of the country's oldest and most influential African American Greek-lettered organizations, recently cancelled its annual meeting scheduled to be held in Phoenix in July and expected to generate at least 10,000 attendees (Alpha Phi Alpha 2010). The General President of the Alphas stated that the meeting would not be held "in a state that has sanctioned a law which [they] believed [would] lead to racial profiling and discrimination, and a law that could put the civil rights and the very dignity of [their] members at risk during their stay in Phoenix" (Alpha Phi Alpha 2010).

American cities and organizations have also protested the law by boycotting Arizona and refusing to hold any business in or with the state unless the law is repealed. On May 13, 2010, the City Council of Austin (Texas) approved a resolution which would end business-related travel to Arizona. The Council also asked the City Manager to investigate which business deals Austin has with Arizona in order to discuss terminating such contracts (City of Austin 2010). Other cities which have independently agreed to participate in a business-boycott of Arizona include Los Angeles (CA), San Francisco (CA), Oakland (CA), Denver (CO), and Seattle (WA) (amongst others).

The Asian American Justice Center, a civil rights organization dedicated to promoting the equality of Asian Americans also announced a boycott of business-related travel to Arizona, and urged others to do the same (AAJC 2010). A group of civil rights organizations, including the American Civil Liberties Union, the Mexican American Legal Defense and Education Fund, the Asian Pacific American Legal Center, and the National Association for the Advancement of Colored People, filed suit against the bill claiming that the law "would subject massive numbers of people—both citizens and non-citizens—to racial profiling, improper investigations, and unlawful detentions" (ACLU 2010).

Even US President Barack Obama weighed in on the issue during a joint meeting with México's President Felipe Calderón. President Obama stated that the White House was examining the law's implications, including civil rights, because "in the United States of America, no law-abiding person—be they an American citizen, a legal immigrant, or a visitor or tourist from México—should ever be subject to suspicion simply because of what they look like" (The White House 2010). Additionally, the US Department of Justice, along with the US Department of Homeland Security and the US Department of State filed a suit against the State of Arizona stating that SB 1070 "unconstitutionally interferes with the federal government's authority to set and enforce immigration policy" (The New York Times 2010). The US DOJ also sought an injunction to prevent the law from going into effect on July 29 (as scheduled) claiming its unconstitutionality. On July 28, 2010, US District Judge Susan Bolton, who is presiding over the case, filed an order blocking the implementations of several provision of SB 1070, including the one being discussed in this study (Fox News 2010). Governor Brewer in turn filed an appeal to the 9th US District Court of Appeals (San Francisco, CA), and a hearing has been set to begin November 1, 2010 (Reuters 2010).

Beyond the US borders, the law has received international criticism from foreign political leaders and governments, including México, the country of origin of many of Arizona's undocumented immigrants. México, with the support of the governments of Argentina, Bolivia, Colombia, Costa Rica, Chile, Ecuador, El Salvador, Guatemala, Nicaragua, Paraguay, and Perú, filed a statement against SB 1070 as a "friend of the court" in the US Department of Justice's case against the State of Arizona. The brief stated that the law may threaten US/Mexican diplomacy, adding that the Mexican government would like to ensure the civil and human rights of all its citizens while in the state of Arizona (Tucson Sentinal 2010). Additionally, the Mexican governors of the state participants (Baja California, Chihuahua, Coahuila, Nuevo Leon, and Sonora) of the Border Governors Conference announced that they would not attend the scheduled meeting in Phoenix in protest of SB 1070, calling the law discriminatory. In response, Governor Brewer (Arizona), who was the host of the meeting, announced that she would be cancelling the meeting altogether (Border Governors Conference 2010). Nonetheless, citing the importance of maintaining positive relationships with Mexico, Governor Bill Richardson (New Mexico) announced that he would be hosting the conference in Santa Fe late September (The New Mexico Independent 2010).

Proponents of the bill insist that officers should investigate an individual's immigration status only after making contact with him/her for another lawful reason (Pierce 2010). Thus, they ensure that police officers will not use a person's physical appearance in determining whether to initiate contact with an individual, and discount the argument against the bill that it will lead to racial profiling. Nevertheless, doubt remains as to whether Mexicans and Mexican Americans will be the target of this new law, and whether an individual's appearance will be the precursor to questioning immigration status. In a handout analyzing the bill and its implementation, the state offers law enforcement officers a list of possible reasons which may be used to develop reasonable suspicion and question an individual's immigration status. According to the list, law enforcement agents may question a person for any of the following reasons (amongst others): if he/she is "in company of other unlawfully present aliens"; if the person is at a location where undocumented workers are known to congregate; if a person is in an overcrowded vehicle; based on how a person is dressed; or, if the person has "significant difficulty communicating in English" (State of Arizona 2010). None of which have been proven to be significant indicators of a person's immigration status. Although the handout clearly prohibits race (or the color of a person's skin) as an acceptable factor in developing reasonable suspicion, it states that "the country of birth may be a factor that…may lead to a determination…of unlawful presence (State of Arizona 2010). Thus, it is undeniable that people of Mexican origin, or those who may appear to be, will be at greater risk of being profiled as undocumented immigrants.

LITERATURE REVIEW

Several attempts have been made to explain attitudes of Hispanic Americans toward public policies, particularly immigration policies. Researchers have identified a list of possible factors which may influence an individual's support for public policies, in general. The most no-

table of these factors are age (Binder et al. 1997), educational attainment (Hood et al. 1997), socioeconomic status (Binder et al. 1997), location (Hood et al. 1997), minority status (de la Garza et al. 1991), and acculturation (Branton 2007). Below is a more detailed review of relevant studies focusing on each of the above variables.

Age

Binder et al. (1997) reported that the older a Mexican American, the more likely he/she would support more restrictive immigration policies. He explains that older individuals tend to have a more narrow scope of what a "true American" is when compared to younger counterparts (Binder et al. 1997).

Education

Hood et al. (1997) suggests that as Hispanics become more educated, their support for less restrictive immigration policies diminished. He states that as "education level rises, sensitivity to the potential tax burden associated with increased immigration also rises (Hood et al. 1997). On the other hand, Binder (et al. 1997) suggests that higher levels of education are associated "with more positive perceptions of immigrants", and support for less restrictive immigration policies. He claims that these attitudes develop mostly at the upper-class, because their education "liberalizes" them from the competition for low-skill, low-wage jobs (Hood et al. 1997; Espenshade and Calhoun 1993).

Generation

Binder et al. (1997) reported that the longer a Mexican American has been in the US, the more likely he/she would support more restrictive immigration policies. Hood (et al. 1997) suggests that in subsequent generations of Hispanics, there tends to be a decline in empathy for undocumented immigrants, thus suggesting that they are less supportive of policies that may benefit undocumented immigrants. This is consistent with de la Garza's findings (et al 1993) which support the structuralist theory. De la Garza (et al. 1993) noted that more integrated immigrants, when considering socioeconomic status, the more attitudes would resemble those of Anglos.

Location

Hood reported that Hispanics residing in areas with large undocumented migrant populations tend to favor more restrictive immigration policies (Hood 1997). He suggests that Hispanics who live in areas with large immigrant populations may feel threatened as everyone attempts to make the best of the economic, social, and cultural resources available to the community (Hood et al 1997). De la Garza (et al. 1993) supports this in his report, suggesting that Mexican Americans in the (USA/Mexico) border-area tend to support more restrictive immigration policies because they believe issues about immigration and immigrants living in the same area will affect them. On the other hand, Hood et al. 1997) also introduces the *contact hypothesis* (Rothbarth and John 1993) which suggests that as groups interact, the negative perceptions once held of the population are replaced by "favorable experiences" and more positive attitudes. Thus, Hood (et al 1997) also suggests that Hispanics living in areas with large undocumented migrant populations tend to favor more liberal immigration policies which may have a positive effect on the immigrant group.

Ethnic Identity

De La Garza (et al. 1991) reports that a stronger ethnic identity with a particular group tends to signify more support for policies that benefit that population. Hispanics who "retain a strong sense of group identity" may be more supportive of policies that affect their ethnic group (Hood et al. 1997). He also suggests that a degree of cultural affinity is an important factor of Mexican American's opinions towards immigration-related issues. He suggests that Latinos are more likely to support less restrictionist views because of their cultural affinity with "nations south of the US border", regardless of other factors (Hood at al. 1997). Therefore, Mexican Americans who maintain a strong cultural affinity tend to support less restrictive immigration policies (Hood et al 1997; Binder et al. 1997). Binder (et al 1997) however, reported that there was no significant correlation between ethnic identity and attitudes towards immigration.

Acculturation

Binder reported that the more "Mexican" (less acculturated) a respondent, the more likely that individual will support less restrictive immigration policies. Hood reported that the more acculturated an individual, the more likely he/she would support more restrictive im-

migration policies (1997). He found that acculturation and perceived economic threat were the most significant factors in determining an individual's attitudes towards immigration policies. Garcia noted that the most significant variable for Mexican-born immigrants in determining views of public policy, was the extent to which the person identifies with being American (or not) (1981). Those who identify more closely with the immigrant group tend to favor policies that provide benefits to immigrants (Garcia 1981).

De la Garza et al. (1993) reported that Latinos' attitudes toward immigration related issues are a result of their level of incorporation into American society. He noted that those who are most "Americanized" (more acculturated) view immigration issues from a perspective "of how they think it affects them personally"; thus, they are likely to hold more restrictionist views (De la Garza et al. 1993).

All reports support the idea that as an individual becomes more "attuned with American cultural traits and practices, his/her attitudes will more closely mirror the views held by the dominant group; that is, as Mexicans become more acculturated, they will tend to support more restrictive immigration policies. Additionally, Branton (2007) reported that acculturation remains the most significant factor in determining opinions towards public policies amongst Latinos. Whereas acculturation has been associated with attitudes of Hispanics toward public and immigration policies in general, there is yet no study (known to the present author) that systematically examines Mexican Americans' support for Arizona SB 1070 as a function of their level of acculturation.

Acculturation of Immigrants

The effects of acculturation manifest themselves through changes in society and in the individual experiencing it. At the group level there are social, political, and economic changes; and, at the individual level, a person may experience changes in identity, values, attitudes, and behavior (Sam 2006). In order for acculturation to take place, there must be continuous, first-hand contact over a period of time and changes in either or both groups (Sam 2006). Berry suggests that acculturation includes simultaneous participation in both cultures and may lead to four outcomes: assimilation, integration, separation, and marginalization (2006). The

four outcomes occur at different rates and are neither "additive" nor do they lead to a person being fully "integrated" (Sam 2006). Additionally, Sam suggests that individuals experiencing long-term acculturation lead to two "adaptation models": psychological and sociocultural (Ward 2001). Psychological adaptation refers to "psychological or emotional well-being and satisfaction" and sociocultural adaptation refers to acquiring the necessary skills to "negotiate or 'fit into' a specific social or cultural milieu" (Ward 2001).

For immigrants, the "fundamental dilemma" is the process of determining whether to assimilate and to what degree, and determining which parts of their original cultural identity they want to keep (Kosic 2006). Additionally, Oudenhoven suggests that the acculturation strategy adopted by an immigrant during the process is important in order to determine the individual's success of adaptation (2006).

Other determinants of the extent of success of acculturation for an immigrant include linguistic, religious, and economic factors. Sharing traits with the larger receiving society may facilitate the process of acculturation for some immigrants.

Sam notes that there are differences in the process of acculturation for women and children of immigrant groups. Specifically, he points out that a woman's second-class standing and a child's age serve as limiting factors (Sam 2006). Additionally, research with immigrants suggests that "nations' immigration policies and their cultural majorities influence the form and the success of immigrants' acculturation (Oudenhoven 2006).

Hypothesis

Previous studies suggest that acculturation has the most significant influence on Hispanic American attitudes towards immigration policies. All previous studies suggest that Hispanic Americans who are most acculturated tend to support more restrictive immigration policies. Therefore, it is hypothesized that the more acculturated a Mexican American, the more likely he/she is to support SB 1070.

METHODOLOGY

Data Collection

The respondents of this study resided in South Texas during the months of June and July, 2010 and, attended either Texas A&M International University (Laredo) or Texas A&M University-Corpus Christi (Corpus Christi). Laredo is a city on the Southwestern border of Texas, neighboring the Mexican city of Nuevo Laredo, Tamaulipas. The city's estimated population is 216,339, of which 89.2 percent reported being of Mexican origin; an additional 5.1 percent reported being Hispanics of other ethnic origins (US Census 2008). Corpus Christi is a coastal city in Southeast Texas along the Gulf of Mexico. The city's estimated population is 284,264, of which 44.5 percent reported being of Mexican origin; an additional 13.6 percent reported being Hispanics of other ethnic origins (US Census 2008). Overall, the South Texas region is 81 percent Hispanic; the state of Texas is 36 percent Hispanic (Texas Comptroller).

A total of 260 students completed the questionnaire: 153 from TAMIU and 107 from TAMU-CC. Of those students, 200 self-identified as Mexican, Mexican American, or Chicano. For the purpose of this study, the focus will be on these 200 respondents.

Students completed questionnaires either in class during lecture (convenience sample), or online via www.surveymonkey.com (availability sample). The classes were selected at random for both institutions and included subjects such as biology, chemistry, history, political science, psychology, and sociology. Permission was acquired from the professors through phone calls and e-mails prior to the visits. The principal investigator visited the classes and offered the students an opportunity to participate in the survey. Additionally, the principal investigator informed the students that participation was voluntary and asked them to verify consent. Flyers were posted on school bulletin boards with information about the survey and respondents were asked to visit Survey Monkey.com where they completed an electronic version of the survey. Students were also e-mailed about the opportunity through student-to-student communication.

The questionnaire consisted of 55 questions: 14 questions about the respondent's background, 11 questions related to SB 1070, and 30 questions which make up

Scale 1 of the Acculturation Rating Scale for Mexican Americans-II (Cuellar et al. 1995). The first 14 questions included questions such as age, sex, parents' educational background, etc. The next 11 questions consisted of a Likert scale ranging from (1) none at all/not at all to (5) very much/definitely. The statements presented included "I support Arizona Senate Bill 1070", "I believe Arizona Senate Bill 1070 will lead to racial profiling in Arizona", and "I would support a similar bill in Texas". The last 30 questions are Scale 1 of the Acculturation Rating Scale for Mexican Americans-II (Cuellar et al. 1995). This scale is composed of two subscales: the Anglo Orientation Subscale (13 items), and the Mexican Orientation Subscale (17 items). The mean of each subscale is calculated, after which the mean for the MOS is subtracted from the mean for the AOS "to obtain a linear acculturation score" that ranges from "very Mexican oriented" to "very Anglo oriented" (Cuellar et al. 1995). The creators of ARSMA-II reported that both subscales had good internal reliabilities (Cronbach's Alpha): 0.86 for the AOS and 0.88 for the MOS (Cuellar et al. 1995).

Data Description

Of the 200 students, 95 percent of the respondents at TAMIU identified as Mexican American while only 50 percent of the respondents from TAMU-CC identified as such. Of these, 46 were males and 154 were females.

The mean age of the subsample was 23 years; and, about 80 percent of the respondents were between 18 and 25 years old. About 62 percent of the respondents indicated that they were first-generation (foreign-born parents, or foreign-born respondent) or second-generation (foreign-born grandparent[s]) Americans. 85 percent of the subsample indicated that they were Roman Catholic; an additional 18 percent indicated they were (non-Catholic) Christians. 63 percent of the subsample indicated "high school diploma or GED" for mother's educational background; 72 percent reported the same for father's educational background.

When responding to questions about SB 1070, 70 percent of the respondents reported having no support "at all" for the bill; 10 percent reported "very little"" support; and, 16 percent reported "moderate" support. When asked whether they believed SB 1070 targets Mexican Americans, 49 percent indicated that they

believed it "definitely" did; 21 percent indicated "very much"; and, 20 percent reported "moderately". When asked if they believed SB 1070 would lead to racial profiling, 62 percent reported "definitely"; 20 percent reported "very much"; and 12 percent reported "moderately". Additionally, when asked if one would support a similar immigration bill in Texas, 71 percent responded "not at all", 9 percent reported "very little"; and, 12 percent reported "moderately".

DISCUSSION

Results

A Pearson correlation of .329 (Sig .≤ .01) was established between a respondent's level of acculturation and his/her support for SB 1070. An analysis using multiple regression was used to measure the relative effect of acculturation on Mexican American's attitudes toward SB 1070. Table 1 demonstrates that acculturation is the only significant independent variable affecting attitudes towards SB 1070. Neither age, mother/father's educational background (which may indicate a respondent's socioeconomic status), or political orientation had a significant impact on these attitudes. The standardized coefficient Beta indicates the relative effects of each of the independent variables on the dependent variable. As demonstrated below, acculturation had the most significant effect on a respondent's support for SB 1070.

TABLE 1. Coefficients[a]
a. Dependent Variable: SupIndex N=195 R^2=.115 df=5 Sig. ≤.000

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	10.738	1.931		5.561	.000
Acculturation Score according to ARSMA II	1.409	.316	.309	4.465	.000
Respondent's Age	.008	.058	.010	.142	.887
Respondent's mother's educational background	.275	.269	.083	1.026	.306
Respondent's father's educational background	.093	.265	.028	.351	.726
Respondent's political orientation	.028	.306	.006	.091	.928

When controlling for a respondent's sex, the effect of acculturation remains the only significant independent variable (Table 2, Table 3).

TABLE 2. Coefficients[a,b]					
a. Dependent Variable: SupIndex N=45 R^2=.213 df=5 Sig.≤.077					
b. Selecting only cases for which Respondent's Sex = Male					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	11.667	4.105		2.842	.007
Acculturation Score according to ARSMA II	1.852	.609	.441	3.039	.004
Respondent's Age	.005	.134	.006	.040	.969
Respondent's mother's educational background	.240	.603	.072	.398	.692
Respondent's father's educational background	-.286	.489	-.103	-.585	.562
Respondent's political orientation	-.380	.525	-.105	-.724	.473

TABLE 3. Coefficients[a,b]					
a. Dependent Variable: SupIndex N=149 R^2=.108 df=5 Sig.≤.005					
b. Selecting only cases for which Respondent's Sex = Female					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	11.667	4.105		2.842	.007
Acculturation Score according to ARSMA II	1.852	.609	.441	3.039	.004
Respondent's Age	.005	.134	.006	.040	.969
Respondent's mother's educational background	.240	.603	.072	.398	.692
Respondent's father's educational background	-.286	.489	-.103	-.585	.562
Respondent's political orientation	-.380	.525	-.105	-.724	.473

When controlling for a respondent's location, acculturation remains the only significant independent variable (Table 4, Table 5).

TABLE 4. Coefficients[a,b] a. Dependent Variable: SupIndex N=142 R^2=.162 df=5 Sig.≤.000 b. Selecting only cases for which Respondent's Institution = TAMIU					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	11.928	2.411		4.947	.000
Acculturation Score according to ARSMA II	1.692	.392	.341	4.313	.000
Respondent's Age	-.044	.079	-.045	-.559	.577
Respondent's mother's educational background	.300	.297	.092	1.010	.314
Respondent's father's educational background	.348	.304	.104	1.144	.255
Respondent's political orientation	-.017	.359	-.004	-.047	.962

TABLE 5. Coefficients[a,b] a. Dependent Variable: SupIndex N=52 R^2=.177 df=5 Sig.≤.092 b. Selecting only cases for which Respondent's Institution = Texas A&M University-Corpus Christi					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	8.558	3.479		2.460	.018
Acculturation Score according to ARSMA II	1.931	.723	.376	2.669	.010
Respondent's Age	.092	.086	.148	1.069	.291
Respondent's mother's educational background	.104	.614	.029	.169	.866
Respondent's father's educational background	-.526	.533	-.157	-.987	.329
Respondent's political orientation	.185	.576	.045	.320	.750

TABLE 6. Coefficients[a,b]
a. Dependent Variable: SupIndex N=82 R^2=.115 df=5 Sig.≤.088
b. Selecting only cases for which Respondent's generation in the US <= First Generation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	5.551	2.836		1.957	.054
Acculturation Score according to ARSMA II	1.124	.677	.181	1.659	.101
Respondent's Age	.049	.083	.066	.593	.555
Respondent's mother's educational background	.352	.391	.115	.902	.370
Respondent's father's educational background	.612	.397	.194	1.540	.128
Respondent's political orientation	.796	.452	.195	1.761	.082

When controlling for generational status, there is evidence to suggest that acculturation remains the most significant independent variable amongst first and second generation Mexican Americans. However, amongst first generation Mexican Americans (which include immigrants and children of immigrants), the respondent's father's educational background is almost as significant as acculturation (Table 6). This suggests that an individual's socioeconomic status may have an effect on his/her support for the bill. Based on the data, it is suggested that first generation Mexican Americans who are participants in the lower stratum of society tend to be less supportive of SB 1070. Additionally, political orientation appears to also have a significant effect on attitudes towards SB 1070. However, because almost 40 percent of the respondents reported having no political orientation, this independent variable has to be studied further before conclusions can be made. Of the remaining 60 percent, 25 percent self-reported as "moderates"; 22 percent as "liberals"; and, 13 percent as "conservatives".

CONCLUSION

It is hoped that these findings will inform future public policies. Based on the data collected, it can be concluded that the more acculturated a Mexican American, the more he/she supports SB 1070. Furthermore, acculturation has an independent and significant effect on the degree of support for SB 1070 and explains more of the variance than all other factors. These results remain regardless of an individual's sex or location of university, but may vary as a result of generational status.

The limitations of this study include the geographic location of the sample, which is predominantly Hispanic (South Texas). For improvements in future research assessing the effect of acculturation on immigration policies, it is suggested that a larger and more representative sample be attained. Additionally, holding focus groups/interviews may further explore the process of acculturation and its effect on attitudes towards immigration policies.

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FEMINISM IN SOUTH TEXAS: THROUGH THE EYES OF DORA MIRABAL

by IZA N. MARTINEZ

ABSTRACT

The intent of this research is to study the life of Dora Mirabal and her ideas regarding feminism, through her writings in Spanish, which were translated for the purpose of this study. Through a review of literature, a comparison was made between Mirabal's ideas and those expressed by the representative white, middle class feminist of the first and second waves of feminism. Mirabal's ideas were also further compared with the ideology of the Chicana feminists of the 1960s and 70s. It was found that there was a slight difference in the expectations Mirabal had, compared to the ones expected from the white, middle class feminist. Mirabal had a different view of what the outcome of feminism would bring for women, concentrating on a communitarian view instead of an individualistic one. The similarities between Mirabal's feminist ideology and the Chicana feminist ideology were surprisingly similar, despite the forty year difference.
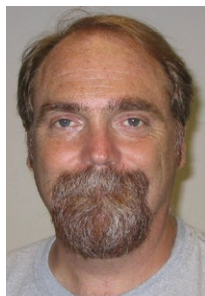
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INTRODUCTION

Throughout history women have been expected to fulfill a certain role: they have been expected to stay at home, take care of their children, but most importantly keep their husbands happy and satisfied. Regardless of their color, economic status, or demographics, women have filled these roles for centuries. Historically, women protested the conditions, arguing the injustice and inequality of the situation. It took many years for women to be heard, their ideas and needs being ignored for centuries. Women still do not have complete equality, experiencing sexism across the globe even now in the twenty- first century, but conditions for women in the United States have greatly improved from those which were experienced during the nineteenth century. It was only when women began to speak out about the injustices being inflicted upon African Americans that their own cry for equality finally began to resonate across the nation.

During the late nineteenth and early twentieth century, American women found themselves in the front ranks of the war against slavery. They played an important role in the abolition movement, and in the process of joining together to fight for the slave's freedom, women realized that they were ignoring their own. They, like the slaves, were being denied the right to vote, and women found it necessary to fight against these legal

inequalities. Abby Kelly, an early feminist wrote, "We have good cause to be grateful to the slave…in striving to strike his iron off, we found most surely that we were manacled ourselves" (Trodd 133). Kelly reflected the thoughts of many white, middle class women at the time, who were just beginning to realize just how unfair and unequal the laws were against them. Proofs of this were the Thirteen Amendment, which freed blacks from slavery, and the Fourteenth Amendment, which gave them the right to vote. These Amendments still left woman out of the coveted circle of voters in America, never acknowledging that they were important enough to have an opinion. It was because of these types of behaviors that women took it upon themselves to reverse the laws which suppressed and silenced them. It took them many years, but in 1919, women were finally able to cast their votes after the Nineteenth Amendment was passed stating that "vote shall not be denied…on account of sex" (Trodd 186).

Years passed and still many women believed that complete freedom from the chains of repression had not been achieved. It was from these thoughts that the second wave of feminism emerged. During the 1960s and into the 1970s, women began to fight against unofficial inequalities such as not having equal pay in the workplace and not being respected sexually. A great number of women believed that even after the many accomplishments gained during the first wave, there were still many old ideologies keeping them down. Betty Friedan was one of the women included in this group and she was a great advocate of a concept that came to be known as the "feminine mystique". This term was descriptive of a force which allowed for the "erasure of the woman identity [and promoted] the myth that female fulfillment comes from domestic abilities," (Trodd 394). Concepts such as these were seen as hindering the process of women's liberation because men were accustomed to women fulfilling certain roles. Even with all the victories made by women, Friedan believed men still saw them as belonging in the home – cooking for them, cleaning, and having their babies.

Beth Bailey also addressed these issues when she spoke of the expectation of women having to adapt their lives to having a family. One of the issues which brought disagreement between women was the newly famous birth control pill. Bailey addressed the issue of how buying and taking the pill always carried certain implications, as by buying it she felt a woman "was making a statement about her sexual status," something which caused great commotion within the community (Kerber 565). The issues of having a woman choose whether she wanted a family and when she wanted to start having children was new, and it was a very hard concept to grasp both for many women and most men. To the women who took part in the feminist movement, having a family equaled being oppressed. They found it necessary to abstain from marriage and the role of being a mother and wife, in order to maintain their independence from men (Levin 264). These were among some of the ways white, middle class feminist tried to separate themselves from the society which for centuries had kept them oppressed.

But these white, middle class women were not the only ones looking for equality. Minority groups were always in the vicinity fighting for their own rights, and among these groups were many women who also had to fight for their own voices to be heard. One such group, Chicanas, was also having their lives "shaped by the multiple sources of oppression generated by race, gender, and social class" (Garcia 5). This group of women had found themselves in America during the 1970s, fighting both for their rights as minorities and against the oppression they were experiencing as women. Following the steps of their male counterparts, these women of Mexican descent now living in the United States gave themselves the title of Chicanas as a way to label themselves as a group which was politically aware of their inequalities. Chicano/a were old labels that were reclaimed to signal engagement in the struggle for social justice and equity in housing, education, labor rights, and other areas. They were listening to what the middle class white woman was saying about the oppression taking place, but they were not agreeing completely.

"We do not want to compete with men. We do want to be given the opportunity to do whatever it is that we do best in the line of work. We want to have our efforts recognized and our successes rewarded with more responsibility and when feasible with financial awards. We want to have our ideas recognized and implemented with credits going to the originators. We want to be in on the decision making if we are "leaders" and to work beside our men as equals." (Garcia 28)

This seemed to be the common agreement among the feminist writers who were speaking out about their conditions amongst the Chicano Movement. They wanted to be listened to, be given credit, but unlike the white women, they wanted to walk next to their men; only, they wanted to do so as equals.

Just as the white woman had a history fighting against the repression of their sex by the male community, Chicanas too had a history with oppression. Although women held important roles in the Mexican society, fighting in wars such as the 1810 War for Independence and the Mexican Revolution of 1910, there continued a need to fight for women's suffrage (Garcia 42). Unlike the feminist movement taking place in the middle class, white female community, the feminist movement in Mexico did not have a dormant period; rather the Mexicanas continued fighting for equality through decades and across borders. This fight for equality continued for the Mexicana woman after many of them chose to move to the United States, and once there they began to be called Chicanas. Even with the change in environment, Chicanas never stopped fighting for their rights. They continued to embrace their traditions, while at the same time fighting to be viewed as people who were worth a voice.

FEMINISM IN SOUTH TEXAS

One of the women who fought to be heard for most of her adult life was Dora Mirabal. She was a feminist writer who lived in Corpus Christi, Texas, and she used her words to voice her opinion about the injustices being experienced by women at the time. She did this from the early thirties until the late seventies, beginning her outcry decades before the Chicano Movement instigated similar outcries from the Chicanas. Mirabal was the first Hispanic female publisher and editor to publish a full size Spanish newspaper and it was here that she published many of her ideas on feminism. *El Progreso* was a newspaper which Mirabal and her husband ran, and many of her pieces can still be found in the publication *El Progreso*, 1939-1940: The work of Rodolfo Zepeda Mirabal and Dora Cervera Mirabal. The very first editorial she wrote for this newspaper was titled El Femenismo Autentico (The Authentic Feminism) and it expressed her view of the role of the women in the home and in the community. She expressed ideas that

would not become mainstream until decades later in the 60s.

> *"That is the fundamental reason of feminism: for woman to fight to be liberated of those laws which decreed her mental incapacity and intellectuality in relation to man; the need to abolish these codes, product of the male brain, which confine her to an inferior level which is damaging, to reach her civic, political, and social rights, how to be civilized, conscious and capable, without forgetting because of this her sacred duty of being a mother and a wife, functioning in harmonious concerto the strength of heart and brain in unison." (El Progreso, June 16, 1939)*

In 1939, when Mirabal began writing her feminist pieces, women were still not very vocal about the injustices they were facing, even after they were given the right to vote with the nineteenth Amendment. As a part of a Mexican community, the need to be silent and care for the home was always the number one priority, but Mirabal found time to balance the act of also tending to her domestic needs. She never forgot about her own identity and the need to go out and "instruct wom[e]n in the knowledge of [their] duties before entering in the practice of her rights which she is justified in demanding" (*El Progreso*, June 16, 1939).

She lived by these beliefs and was "involved in an incredible array of activities, both professional and personal. She was passionate about education and civic involvement," as well as being deeply involved in being a mother (Garza, Rosie. Personal interview. 22 July 2010). Not only was she involved in her household and the family company, but Mirabal was also active in many communal activities. She found time to help the less fortunate, especially those who were not fortunate enough to know English. She opened a free bilingual school for students who could not speak English, making it the first bilingual school which taught both English and Spanish both locally and nationally. Even while busy helping and empowering the less fortunate she never forgot "her sacred duty of being a mother and a wife," learning to balance this role with that of a working woman (*El Progreso*, June 16, 1939). Although she wrote many pieces voicing her opinions on the place society assigned to women, in her own home she chose to lead by example rather than by simply being vocifer-

ous. When she began "seeing women [were] being rele-gated to second class status in the Hispanic Chamber of Commerce and other organizations [it] led her to seek a greater role for women there" (Garza, Rosie. Personal interview. 22 July 2010). She witnessed the unfairness that was taking place in the Chamber of Commerce, but contrary to what was expected from women at the time, she did not sit back and watch the injustices continue. Rather she decided to make a change and did so by becoming the first female member of the Hispanic Chamber of Commerce, which was then known as the Mexican Chamber of Commerce.

Mirabal had knowledge and respect for the fight that women had previously fought in order to provide women with more rights, as can be seen in her piece "Authentic Feminism."

> "..it is undeniable that feminism when well understood, [that] which is a symbol of good and progress, has filed down chains, abolished injustices, distinguished women from darkness towards the light, showing her a wider horizon, which tends in the end to the harmonious union of existence" (El Progreso, June 16, 1939).

She herself was an advocate for feminism, finding it necessary to voice her opinions regarding the suppression of women, but contrary to the view many times expressed by the white, middle class feminist, Mirabal did not see the need to call for "individual freedoms by mobilizing sex solidarity" (Buechler 104). In many ways she shared an early view of the ideas that the Chicana movement promoted twenty years later, rather than taking the point of view of the white, middle class feminist. Chicana advocates many times voiced a need to become an isolated identity, completely separated from man in order to be recognized, while Mirabal focused more on achieving equality in order for women to receive the respect that they deserved. In her writings she encouraged equality for women, not their complete separation from the lives they were already living. She believed that the power which feminism would provide a woman would not only allow her to find her self-worth, but would also help her grow as a wife and a mother. It was necessary for the young woman to learn what her duties were, but to never forget that within these duties she too had her rights.

> "It is then of great importance, to illustrate to the feminine youth in formation, the one which is called to be the housewife of tomorrow and mothers of a new generation, in the knowledge of her rights, within the responsibilities of her duties." (El Progreso, June 16, 1939)

It was with these words that she encouraged women to become the greatest they possibly could be, in whatever area they chose to focus on.

Her daughter Rosie Mirabal Garza recalls the relationship her mother had with her father as she worked to find equality for women. "She and my father were constantly working together. It was really not so much two separate worlds of family and work, but rather a melding of those two worlds, and my mother was, in many ways, the glue that held them together" (Garza, Rosie. Personal interview. 22 July 2010). Mirabal saw marriage as a union which by the union made each individual stronger. Rather than seeing the need for women to become separate individuals from men, Mirabal believed that both man and woman gained from the union. Mirabal wrote in her piece The Woman in her Physical and Moral Aspect, "By the intimate union of the body with the soul, she develops to proportion that he develops," clearly demonstrating that women could grow by joining themselves to a man (El Progreso, Nov 10, 1939). She understood the limitations women could find in their lifetimes, stating that women were not as strong or fast as men, but undoubtedly had as much right to become educated. Regardless of the physical appearance of the woman, Mirabal believed it was their right to be educated, and not society's place to withhold this privilege from them.

It was because of this that Mirabal found herself encouraging women to receive an education. She believed women were underestimated by society, and should not let themselves be placed on a pedestal. "It seems to be that education believes that the delicate hand of the woman cannot grab volumes without wasting away its gentleness, and since it is its belief that a pretty and soft hand is worth more than a cultivated intelligence it prefers this vanity over knowledge of the past" (El Progreso, November 10, 1939). Society was not yet accepting of the fact that women were equal to men, both in intellect and wisdom, but Mirabal was aware that this was

untrue. She lived in a time period when women were not active in society, yet she broke the rules and was extensively involved in the community. She expressed her opinion through her writings, but rather than just preaching to women everywhere on what should be done to break the shackles society placed on them, she led by example.

CONCLUSION

Mirabal lived in a time period when feminism was not very popular. Her Mexican descent called for her to be a submissive woman, dedicated to being at home serving her husband, but Mirabal broke the mold. Rather she was able to live a balanced life in which she was able to handle being a working woman and a wife, decades before feminist began to fight for this balance. Mirabal's ideas went against those of the white, middle, class feminist who later on in the 60s and 70s found it necessary to separate themselves from men in order to find their individuality. Rather, Mirabal encouraged women, who listened, to work beside their man. She believed it was the woman's choice to do as she chose, regardless of whether her choice was to be a housewife, a working woman, or both. Many decades later Chicanas would voice similar needs, but Mirabal was ahead of her time addressing these issues in 1939. As her daughter Rosie Mirabal–Garza recalls,

"Her instinct was to not frame things in terms of one group versus another. In that respect, I think she was in contrast to some other activists. Each person has their own view of how to achieve a desired result and many may be valid and helpful to a greater or lesser degree." (Garza, Rosie. Personal interview. 22 July 2010)

Mirabal certainly had her own opinion on how to live as a woman in a male dominant world, and as a woman living in Corpus Christi in the late ninety thirties, this was very uncommon. Yet Mirabal was able to voice opinions which were later reflected by many women sharing the same concerns she fought for years to correct.

For the purpose of this study I translated five pieces from the compilation book *El Progreso*, 1939-1940: The Work of Rodolfo Zepeda Mirabal and Dora Cervera Mirabal by Rosie Mirabal Garza, which was published in 2004.

What is it to be a Wife?
October 27, 1939

What is it to be a wife?

To be a wife is not to be the maid of a man.

It is not to be his lover.

It is not to be an impure fountain from where vile passions extinguish his thirst.

It is not being his companion for a day.

It is not being a possession bought by a thing called dowry, it is not being merchandise with which to speculate with.

To be a wife is to be a chosen woman preferred over many others because of her honesty, her religiosity, for her kindness,

for her diligence, her laboriousness, for her meekness, her pleasantness, for her moderation, for her prudence, for her

common sense, for her tenderness, for her modesty, for her composer, for her submission, for her economy.

To be a wife, is to be a woman chosen among millions because of her virtues, her immortal halo, her splendid adornment, her everlasting perfume, her everlasting enchantment, her celestial attractiveness, divine manifestations of the inexpressible perfection of god himself; it is being chosen for her Christian virtues, more for her faithful virtues than for her exterior

beauty, fleeting accident that with a sickness or with the years vanishes, or with the continuous possession revolts.

To be a wife is to be the comfort, the happiness, the richness, the delicacy, the joy, and the life of a man, whose fate depends upon her own.

To be a wife, is to be the inseparable companion of a man, it is to be loved with a pure love, with a constant love, with a rational love, with a religious love, with an unselfish love, with a fervent love, and as lasting as life.

To be a wife is to be respected, attended, to be taken care of, it is to be the half of that same heart, bought with the price of her virtues.

To be a wife is to be the future, it is to be the crown of generations, it is to be the hope, it is to be the honor and the holy pride of the religion of the fatherland and humanity.

This is to be the wife.

A Woman's Education
-Her Intelligence-
November 3, 1939

The science of God, the science of man, the science of nature, the language of antiquity, the history, the eloquence, the poetry, the beautiful, the sublime is not only a gift exclusive of one sex it is the patrimony of intelligence.

The woman too has intelligence, and an intelligence of the same nature, so capable, so vast, and as flexible as that of man.

So too, to the woman belongs this patrimony.

So then, the education should work so that she too can posses it.

Poor woman! She is born, and since she is in her cradle she does not see anything else but a crown of wreaths and branches for her head, jewels and silk for her body; nor does she hear anything other than the mournful prayer of her poor intellectual condition, and it is because she is always seeing and hearing the same thing, that she convinces herself that her real mission in this earth is nothing more than to fix her body in order to conquer men with her bodily attractions.

While her body is being exalted, her soul is being humiliated and depressed; her potential is bottled up, her faculties are put to sleep and she can barely hit the mark with her needle.

Overwhelmed since infancy with the weight of the chains of gold which she is captive of, she believes it is her destiny to live always under these chains and to ignore everything, even her own imprisonment.

Similar to those who always live unhappy subject to an old tyranny, she believes that carrying the yoke is the natural state of her condition.

She sees the chains, she touches them, and she drags them too, but she ignores that carrying them makes her a slave.

It is education's fault that this queen, so distinguished and so beat down, is under captivity.

The woman is material or physically weaker than man.

Because of this, education should work to give her moral strength, helping her develop even more her intellectual faculties.

Only like this would there be equality in strength and the man would no longer be the lover of women.

But unfortunately, education does not allow this.

Quite often many mourn the fact that women take so long to fix up her body, forgetting to illustrate and perfect her soul.

Because of this she is criticized, talked about, and many times even despised.

Yet this way of thinking is very unjust, the fault is not that of the poor woman, like I have said, but rather that of education.

Give her what she deserves, elevate her to her worth, return to her the inheritance which belongs to her, and you will see then that woman does not spend her time fixing up her body, as much as she does fixing her soul: she will no longer live with that which has been borrowed, nor will she beg for merit in the stores, nor the dressmakers, nor will she live in a hut.

The complaints of those who speak against women are the same as those of those rich families, who see someone in dire need due to bankruptcy. They do nothing more but lament his misery, many time whispering about the unhappiness of the man and even turning their faces against him when they see him in the streets; but they do not stretch their hand towards him and save him on order to elevate him to their own worth.

Stop then you, unjust and inhuman, complaining of the unhappy woman, and try to elevate her back to the rank which she is deserving of.

Authentic Feminism
June 16, 1939

The absolute equality of rights between man and woman is argued about very often. But those who do so are committing a grave error. Although there are certain aspects, in which that equality can be established, in the moral order it does not make sense to suppose so.

If the free actions of men were to constitute a model to the life of a woman, it would create great social scandal.

Apparently there exists a misunderstanding of what feminism means in its strictest and basic sense. This misunderstanding is based in part, to the vast sphere of influence, which is overpowering amongst the popular class, wrongly prepared to asses it in the fair limit of its fundamental principles.

Because of this lamentable lack of knowledge, there exist women who confuse the permissible free will and the reasonable right of action with extreme liberty, losing by doing this, the noble expression of seriousness, which constitutes her best charm.

Because it is undeniable that feminism when well understood, the one which is a symbol of good and progress, has filed down chains, abolished injustices, distinguished women from darkness towards the light, showing her a wider horizon, which tends in the end to the harmonious union of existence, it is also very true that in her name and in the protection of her shadow are sheltered women who without their knowledge, or without wanting to recognize it, forget principles, sweep prejudices, and drag in their steps pieces of their own and others dignity.

This social evolution in its complete form presents the efficient solution to the dark feminist problem, it cannot be the hasty labor of one day, nor have its effect of complete integration without a gradual process of preparation, and not without destroying the strong obstacle which opposes the free course of its high finality.

It is then of great importance, to illustrate to the feminine youth in formation, the one which is called to be the housewife of tomorrow and mothers of a new generation, in the knowledge of her rights within the responsibilities of her duties.

Feminism was born, because of a need of social defense. In order to defend the woman of that same society in charge of exalting her worth and that therefore condemns her to a depressing and painful inequality.

That is the fundamental reason of feminism: for woman to fight to be liberated of those laws which decreed her mental incapacity and intellectuality in relation to man; the need to abolish these codes, product of the male brain, which confine her to a inferior level which is damaging, to reach her civic, political, and social rights, how to be civilized, conscious and capable, without forgetting because of this her sacred duty of being a mother and a wife, functioning in harmonious concerto the strength of heart and brain in unison.

From this beautiful association of ideals will surge the universal balance based on the firm principles of equality and justice. Woman, like the disciple of peace, like a champion of a pure ideal, will not only fight for her own interests; who will also place her moral force against social injustices, to the destruction of towns, to everything which means savagery in order to bring together and to move souls, waking up consciences; and thus raising the flag of a real peace, effective and complete universal brotherhood.

Because of this, it is one of the missions of feminism, we repeat, to instruct woman in the knowledge of her duties before entering in the practice of her rights which she is justified in demanding. A conscience needs to be created, we need to signal to them the ethical norms which are to be followed, orient them towards a higher level of moral superiority which will take them to the discovery of their own worth, and which will always sustain her in the ranks dignity.

The feminism which every woman should know is the one which is based on respect and duties; the one which is a home with a fire, has the lullaby on the lips of the mother, self-denial in the eyes of the wife, peace, love; loyalty.

Only like that, does the woman have right of the reign which she is worthy of as a queen and lady of the home, and the world. Only like this, crowned with the prestige of her femininity and her virtues, wrapped around her pure shawl of modesty, touching and shining her light magnificent and triumphant, with the incomparable strength of her exquisite weak

The Woman: In Her Physical and Moral Aspect
November 10, 1939

Woman is weaker than man; this is true but only in the physical way.

What nature wants to say with this is that her physical education is to be accommodated to her smaller robustness, it means to say that she should not engage in corporel exercise like the man, it means to say to this matter that she should be educated differently; it means to say that she was not born for the battlefield, nor to deal with beasts, nor to fight against the waves, nor to take the plow.

But it does not mean to say that education reduces her knowledge to the narrow limits to which it's reduced.

It does not mean for education to make a monopoly of the sciences.

It does not mean that education leaves the rags to her and the gold to the man.

It does not mean that education degrades the soul of the woman and enhances her body, so that she is later devoured by the crows.

By the intimate union of the body with the soul, she develops to proportion that he develops.

The physical organization of woman at no point stops the development of her soul.

The oppressors want to believe that the physical weakness of the woman makes her spirit be weak as well.

There is no such thing, because if there was some other sort of education, this imagined spiritual weakness would not exist.

Education has exploited never the spirit of the woman, her talent, her capacity, her intelligence?

It has taken the pen away from so many men who should be working the needle, and has given it to so many women that have been working the pen?

It has experimented to see what height woman can be elevated in the knowledge of the sciences?

This has been up to till now a task too difficult for its criminal laziness.

But if it would have dedicated itself to creating woman how she should be, how many Paulas, how many Gertrudes, and how many Catalinas wouldn't it have given.

It seems to be that education believes that the delicate hand of the woman cannot grab volumes without wasting away its gentleness, and since it is its belief that a pretty and soft hand is worth more than a cultivated intelligence it prefers this vanity over knowledge of the past.

It does not by any chance let the dust of the scientific schools touch from afar the silk of her dress.

This dust that after being tamed by the sweat of man produces the magnificent buildings of the immortal work of the human intelligence, does not even want for women's hands to produce kettles.

She appreciates more a rich dress than all the works of the wives.

But suppose for a moment that the weakness of the spirit of the woman is really in relation to her physical weakness, I ask.

And this spirit such as she has, is cultivated by intelligence as nature demands?

Is it cultivated proportionate as that of man's?

Is it even cultivated relatively the same as her body is cultivated?

The woman, exiled by modern education to the corner of the palace of sciences, only feeds herself with the leftovers of man, and dresses herself with the rags that he gives her as charity.

Being as rich as man, education makes herself look poor that far from seeming to be his mother, does not appear more than slave.

Unjust education?

Nature protests against your tyranny.

The Woman
February 23, 1940

The gods have not made but two perfect things, the woman and the rose.

A woman tears down in a day what a man ponders about for a year.

The ugly woman offends and hurts the vision, and the beautiful one offends and damages the judgment and reason.

Woman should not be content simple with her conscience testimony, but rather she should search for that of the world as well.

Don't ignore that without woman the human race would have perished with Adam. There would not be cities, craft men, and farmers. There would not be kings, knights. There would not be merchants or commerce. There would not be art, laws, or statues. There would be no parties, games, dances, nor love, which overcomes everything. Nobody would know the movement of the skies and the planets, nor would they have knowledge of them, nor would they search for the hidden operations of nature. No one would know why the ocean swells, nor how the earth's veins filter water to later recover; nor the mutual assembly of the elements, nor the influence of the heavenly bodies, nor to whom the four seasons answer to, nor the shortness or length of the nights, nor why the echo responds from the furthest point when a man screams; nor why the wind attracts the rainy clouds, nor why it impels it behind mountains, nor why the earth trembles, nor a multitude of natural phenomenon, which if I were to list would tire you.

The woman is without doubt favored by nature of course, she has placed within her hands the magic wand of virtues which changes bad to good and makes resurface from the dry rocks the fountain of comfort and hope.

The woman was born to be the preserver of domestic peace, just like the antique virgins were of the sacred fire.

The woman should place all her effort in attempting to never appear as man, but rather resemble the angels her brothers.

Society rejects the woman who boasts of being wise, because it doesn't want her to reign intellectually, intermediate between the earth and the sky, but rather with soul which is the essence of divinity.

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ACKNOWLEDGEMENTS

AN INTERACTIVE VISUALIZATION TOOL TO EXPLORE THE GEOID

by JONATHAN M. ORTIZ

ABSTRACT

An important aspect of city and emergency planning is knowing what areas are susceptible to flooding, especially in coastal regions prone to hurricanes, such as the Alabama and Florida border coast along the Gulf of Mexico. These areas, known as flood zones, are determined by a number of factors. A crucial component to their determination is the use of accurate elevations, which rely on an accurate geoid model for reference. The geoid is the equipotential surface of the Earth's gravitational field and corresponds with mean sea level. Elevations referenced to the geoid will reflect undulations in the Earth's gravitational potential due to varying densities and topographic masses. The aim of this research is to develop an interactive visualization tool that shows undulation differences between terrain referenced to an existing geoid model and our geoid model using an established level-of-detail algorithm, the Real-time Optimally Adapting Meshes algorithm known as ROAM, to render the meshes and to address what affects areas of significant difference in undulation may have on this area.

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INTRODUCTION

The need for height modernization is a crucial problem for coastal regions due in part to a constantly changing topography and geoid--the equipotential surface of the Earth that coincides with mean sea level [1]. In general height modernization refers to updating and accurately determining elevations, the importance of which is expressed in the applications that elevations are used in, such as having efficient transportation and commerce systems, depicting sea level rise and thus mitigating damage from coastal storms, and planning emergency response to natural disasters such as floods and hurricanes [2].

In Geodesy and Geophysics, heights and elevations have two distinct definitions. The following equation expresses the relationship between heights, elevations, and the geoid:

$$h = H + N$$

Heights, h, refers to geometric heights, which is the measure that is obtained from GPS technology and is referenced to a consistent and uniform approximation of mean sea level known as the ellipsoid [1]. Geoidal heights, N, refer to the geoid-ellipsoid separation at a particular location. Orthometric heights, h, are the

heights used for surveyed elevations and are referenced to the geoid. They are representative of changes in gravitational potential and as such depict the flow of water [1] [7]. Therefore, determining an accurate geoid is one of the basic elements of height modernization.

We have developed a preliminary interactive visualization tool to express the importance of accurate geoid determination. The goal is to compare an existing geoid model against one from which we derive through theoretical free air gravity anomalies and show what differing conclusions could be made based upon which geoid model is used.

VISUALIZATION TOOL

Developing the visualization tool consisted of three stages. The first was to acquire the necessary data to complete the project. The second was to perform any necessary processing prior to using the data and to calculate the geoid for the region using the free air anomaly dataset. The final stage was to develop an interactive visualization tool that would render meshes created from data in stage 2 and facilitate an interactive environment for exploring the importance of accurate geoid determination.

Data Acquisition

The elevation data was acquired from the National Oceanic and Atmospheric Administration (NOAA) as a national elevation dataset (NED). The NED's geographic coordinates conform to the North American Datum of 1983 (NAD83). The vertical datum from which the elevations are referenced is the North American Vertical Datum of 1988 (NAVD88). The geoid model used by NAVD88 is the Geoid09 model which is a refined hybrid model covering the United States and other territories [6]. The NED is provided in a regular grid with 30m resolution consisting of approximately 26 billion points.

The free air anomaly dataset was available through prior research from within Texas A&M University – Corpus Christi, gathered in a cooperative effort with the U.S. Navy Research Laboratory using their airborne gravity modeling system. However, it was unclear what prior processing had been done to the data and so we had to assume it was corrupt. Consequently, the context of the project became theoretical. The dataset was in an incomplete regular grid at a much lower resolution than

the elevation dataset and consisted of approximately 22,000 measured points.

Preprocessing

As a requirement to the visualization stage we had to compute the geoidal height for every elevation point. We use the elevation dataset as a template because it is a complete grid and at a higher resolution than the free air anomaly data. Prior to using the free air anomaly data for geoidal height computation, we needed to interpolate the missing values to complete the grid. We chose an ordinary Kriging method for interpolating those values because it was utilized in the prior research from which the free air anomaly data originated. This was accomplished by means of a Matlab program known as EasyKrig v3.0 [5]. Once the free air anomaly grid was complete we were able to compute the geoid undulations.

There are several methods used for geoid undulation determination in both two-dimensional and three-dimensional structures [6] [7]. The method utilized in this project was a simplistic two-dimensional approach which used an MxN grid of gravity anomalies as input to a discrete convolution where Δx and Δy are the spacing along the x and y axes of the grid, respectively:

$$j\Delta x \Delta y,$$

$$j$$

The y symbol represents normal gravity and Δg is the gravity anomaly for a specific point. The convolution includes contributions to N from all other points in the region based on their distance to the point of computation. The contribution at the point of computation must be calculated separately and was approximated with the following formula:

$$l$$

The resulting grid of geoidal heights was then linearly interpolated to match the 30m resolution of the elevation grid and the extents of the geographic region it covered.

Using the height relationship equation from the introduction and the Geoid09 model, the geometric height, h, for every point in the NED was calculated. Those heights were then referenced to our derived geoid model to create a theoretical elevation data set for comparison.

Visualization

An important characteristic of any interactive software is its response time to user input. Therefore, one problem inherent with developing an interactive visualization tool is maintaining a high frame rate. We addressed this problem in two steps: reducing the amount of memory used and using a level-of-detail approach to render.

The first step was approached in two ways. We wanted to provide the user with the ability to view the geographic region as a whole, and to accomplish this we had to lower the resolution of the data sets to 120m. However, we also wanted to allow the user to view the region in its finest available detail. To accomplish this the datasets were partitioned into a 5x5 grid totaling 25 sections from which the user could choose sections of the region to view in greater detail.

Although the number of points for the mesh is reduced in step one, there still remained millions of points to render per section. To maintain a high frame rate, an established level-of-detail rendering algorithm, known as the Real-time Optimally Adapting Meshes algorithm (ROAM), was used. ROAM creates a dynamic mesh in which the level-of-detail is dependent on factors such as distance from camera, screen length of edges, and exclusion from the view frustum [8]. Figure 1 shows an orthographic projection of the dynamic mesh created by ROAM.

Aside from the rendering options provided to the user, an algorithm was implemented to detect significant changes between the two elevation datasets. These sig-

FIGURE 1. Orthographic view of the dynamic level-of-detail mesh created by ROAM.
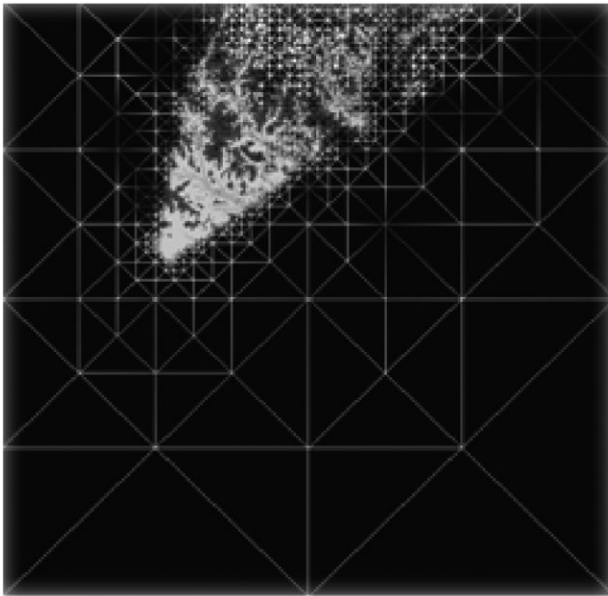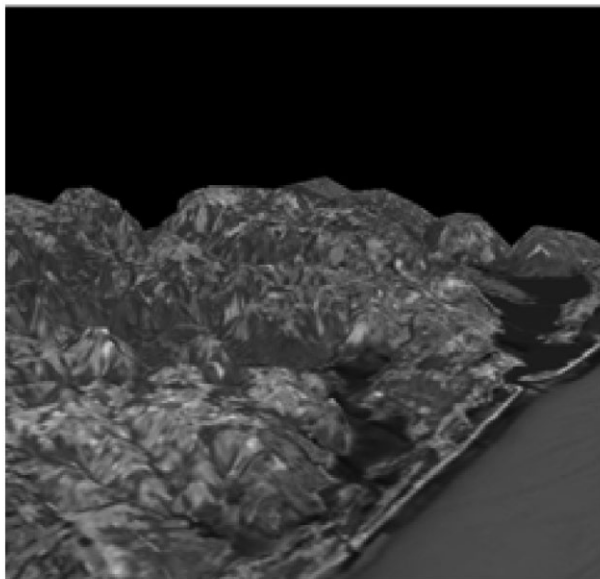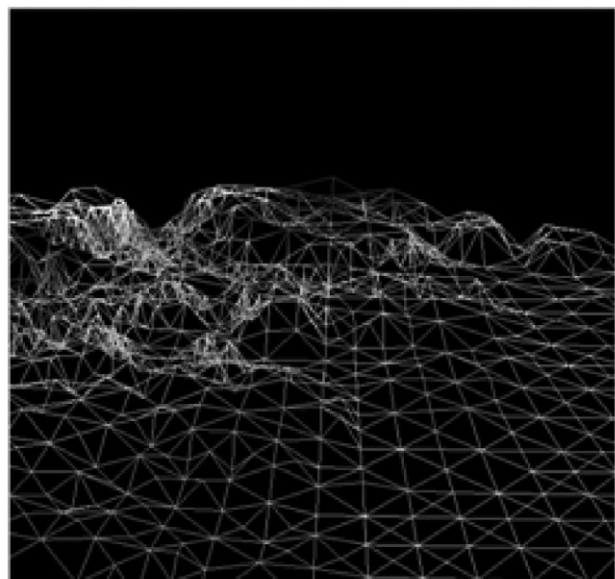

FIGURE 2. The resulting rendered mesh of the elevation dataset: a) texture overlay of geographic area, b) wireframe showing the dynamic mesh constructed by ROAM level-of-detail mesh created by ROAM.

2a

2b

nificant changes are representative of inverse changes in gravitational potential from one point to another and could translate to a reversal of water flow depending on which geoid model the heights of the points are referenced to.

RESULTS

The resulting visualization tool allows for the exploration of two distinct terrain meshes created from elevation data. The distinction between the two comes solely from the geoid model they reference. The tool is best utilized as a medium for portraying the significant impact the geoid can have on orthometric heights and consequently the impact it can have in decision-making that relies on such heights. A poorly modeled geoid could result in poor emergency planning, construction planning, and/or depiction of sea level rise. Figure 2a shows the visualization tool rendering the Alabama – Florida coast with a map of the region textured to assist in user navigation. Figure 2b shows the same area but in wire frame.

Although our derived geoid model and the Geoid09 model have different gravitational potentials at every point, due to the use of theoretical anomaly data, the points that are most interesting are those shown in Figure 3. The result of the algorithm mentioned in the lat-

FIGURE 3: Inverse changes in gravitational potential between derived geoid model and Geoid09 model.

ter part of the Visualization section, performed over the two meshes. The black points mark locations on the Alabama – Florida coast where the gravitational potential will reverse depending on which model the elevations reference. This is significant because one would expect the water to flow in a certain direction when using Geoid09 as a reference and flow in the opposite direction when using our theoretical geoid model as a reference. In the scenario of emergency response planning, the use of the less accurate geoid model would result in wasted resources in areas that are not at actual risk as well as jeopardizing the safety of the public.

CONCLUSION

In this paper, we discuss the development of an interactive visualization tool to explore the influences of the geoid and the importance of its accurate determination. We used an existing national elevation dataset and geoidal heights taken from the Geoid09 model to calculate geometric heights, and referenced those geometric heights to our geoid model derived from theoretical free air anomalies to create a second elevation dataset. Using a level-of-detail algorithm, ROAM, we rendered the two datasets as meshes representing the terrain of the Alabama – Florida coast. We also discuss the significant changes between the two meshes, specifically, the inverse changes in gravitational potential.

Future work will include a derived geoid determined using real and current free air anomaly data. In addition, the method for which the geoid is derived should be revised to produce a more accurate geoid determination, such as filtering the effects of topographic masses and using spherical harmonics [7]. Improvements to roam may also be required to increase its efficiency.

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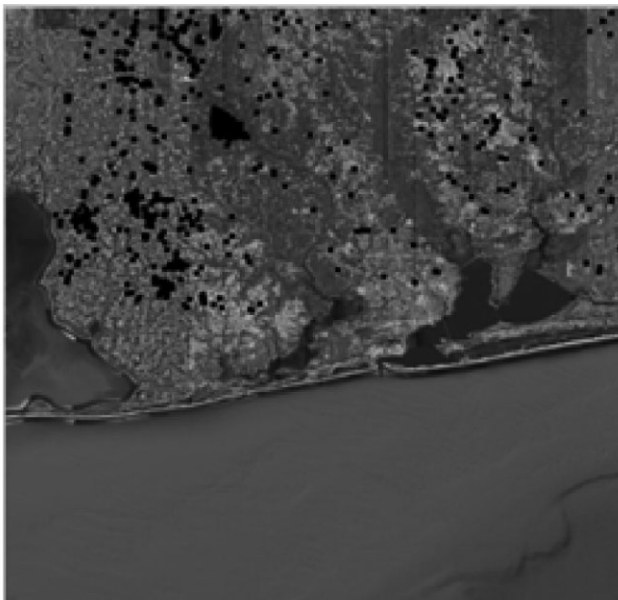
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THE ASSESSMENT OF SEDIMENT SUITABILITY A NECESSITY OF SUCCESS FOR OYSTER REEF RESTORATION PROJECTS

by STEPHANIE PARKER

ABSTRACT

Approximately 85% of historical oyster reefs are unaccounted for or destroyed, making them the most degraded coastal habitats in the world. For several decades, they have become degraded due to over-harvesting, disease, pollution and habitat loss (TNC 2010). An invaluable component of water filtration in the coastal ocean, one oyster can filter up to fifty gallons of water per day by removing sediments, pollutants, and microorganisms. Oyster reefs also serve as habitats for numerous creatures including mollusks, worms, crustaceans, sponges, fish, and birds.

Because of the depletion of one of the ocean's most precious and unmatched resources, there is urgent need for oyster restoration programs. In an effort toward restoration, the Harte Research Institute at Texas A&M University-Corpus Christi is requesting a nationwide permit from the US Army Corps of Engineers for a 3.8 acre oyster reef restoration project. The goal of this project is to restore Lap Reef, a historical oyster reef located in Copano Bay, South Texas. The project will utilize reclaimed oyster shells from restaurants and seafood distributors in the Coastal Bend area in South Texas to act as recycled marine substrate. One challenge to oyster reef restoration is that the oyster shell substrate will sink into the soft bay sediments. So to address this concern, a 49 station grid was constructed over Lap Reef. Each station was tested for water depth, soil penetration, and shell hash weight. Extensive sediment analysis was also done. The key to maintaining the project's goal of reef re-creation lies in identifying the most sufficiently strong areas of sediment. This was accomplished and a location was proposed for the reef restoration project.

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INTRODUCTION

On April 20, 2010, a BP (British Petroleum) oil rig exploded in the Gulf of Mexico. This was a massive oil spill, one of the largest offshore spills in U.S. history and among the largest oil spills in history. According to The Nature Conservancy (TNC) this was tragic in terms of loss of life and ecological impact. The oil spill is expected to further impact oyster reefs which have already been degraded by over-harvesting, disease, pollution, and habitat loss for several decades (TNC 2010). Approximately 85% of oyster reefs are unaccounted for or destroyed, making them the most degraded coastal habitat in the world (Beck et al., 2009). The losses

of oyster reefs outnumber the reported losses of other important marine habitats including coral reefs, mangroves, and sea grasses. Because of this rapid depletion of one of the ocean's most precious and unmatched resources, there is an urgent need for oyster reef restoration programs. These reefs are not only important in terms of commercial value, but also serve a number of important ecological roles in coastal systems. They provide important habitat for a large number of species, as filter feeders they improve water quality, and the reef structures form natural coastal buffers.

"Oyster" is the commonly implemented title for a number of distinct groups of bivalve mollusks that live in marine habitats. Crassostrea virginica is an oyster species native to the Eastern seaboard and Gulf of Mexico. Like all oysters, C. virginica are bivalve mollusks with hard calcium-carbonaceous shells (Simkiss, 1965). Oyster reefs form naturally from the accumulation of oyster shells over generations (Norris, 1953). As successive generations of oysters settle and grow, reefs become highly complex, consisting of large numbers of individuals. The hard surfaces of the shells, along with the nooks between accumulations, provide habitat for small animals. Beyond that, oyster reefs also provide food to a wide variety of secondary consumers. Many species of fish prey upon the microorganisms inhabiting the reefs, while others prey upon oysters themselves. According to the National Estuary Program Study, mollusks, worms, crustaceans, sponges, fish, and birds utilize oyster reefs for foraging and feeding in the Coastal Bend area (Tunnell, & Dokken, 1996).

The development of juvenile sized oysters into adults is dependent on the hard substrate that existing oyster shells provide. An oyster's life cycle begins with "spawning" (Fig.1). Increased water temperature, generally occurring at mid-April, activates spawning among bay oysters. The spawning process occurs as eggs are released and fertilized by outward sperm release. Eggs become fertilized and go through several planktonic larval stages. The last stage is involved in settlement, when the larvae attach to a hard substrate and become what is called "spat," which is the term used to describe a recently settled oyster. Over time, spat grow into adulthood.

Oysters are an invaluable component of water filtration in the coastal ocean and, when populating an area, can vastly improve water quality. One oyster can filter up to fifty gallons of water per day removing sediments, pollutants, and microorganisms (Beck et al., 2009). This is because oysters are "filter feeders," straining particles from the water column over their gills in order to feed. Additionally, because oysters are sessile, and bioaccu-

FIGURE 1. The Life Cycle of an Oyster
Leffler, M. (2002). The Hatchery Connection. Retrieved from http://www.mdsg.umd.edu/CQ/v01n3/side3/
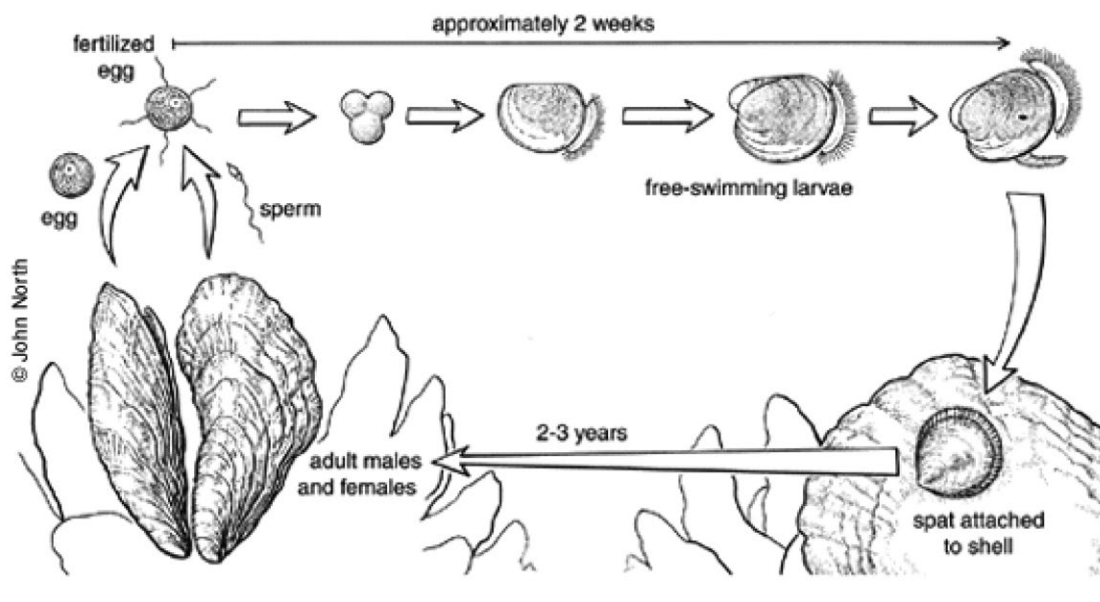
mulate some potential toxins and pollutants found in the water column, biologists have intentionally used them to assess the environmental health of certain areas (Cajaraville et al., 2000).

Continued overharvesting and dredging has diminished natural shell replacement on oyster reefs due to excessive removal of shell-producing oysters and their shells, causing reef destruction (Hargis, 1999). Shells have been removed for road building, construction, landfill, chemical production, and food, and dredged to keep waterways navigable.

Oysters are also valuable for protecting shorelines from erosion. Methods such as building seawalls and jetties are used to protect coastal areas from storms and wave activity, methods which disrupt the balance between ecosystems, disconnecting marine life from terrestrial environments. Oyster reefs are a natural solution for this problem (TNC, 2010).

Alternative oyster reef construction methods have been used to restore reefs, including interlocking rectangular cages made of welded steel with space for mesh bags of oyster shells, "oyster castles" made from interlocking blocks of concrete, limestone, crushed shell and silica, and bagged oyster shells and chain link baskets made of welded steel and filled with rock and shells. In Texas, The Nature Conservancy used a high pressure hose to spray several tons of shells from a barge into shallow water in Copano Bay.

In our effort toward restoration, the Harte Research Institute at Texas A&M University-Corpus Christi is requesting a nationwide permit from the US Army Corps of Engineers for a 3.8 acre oyster reef restoration project. The goal of this project is to restore Lap Reef, a historical ocean reef located in Copano Bay, Texas. The project will utilize reclaimed oyster shells from restaurants and seafood distributors in the Coastal Bend area of South Texas to act as recycled marine substrate.

FIGURE 2. Lap Reef Grid
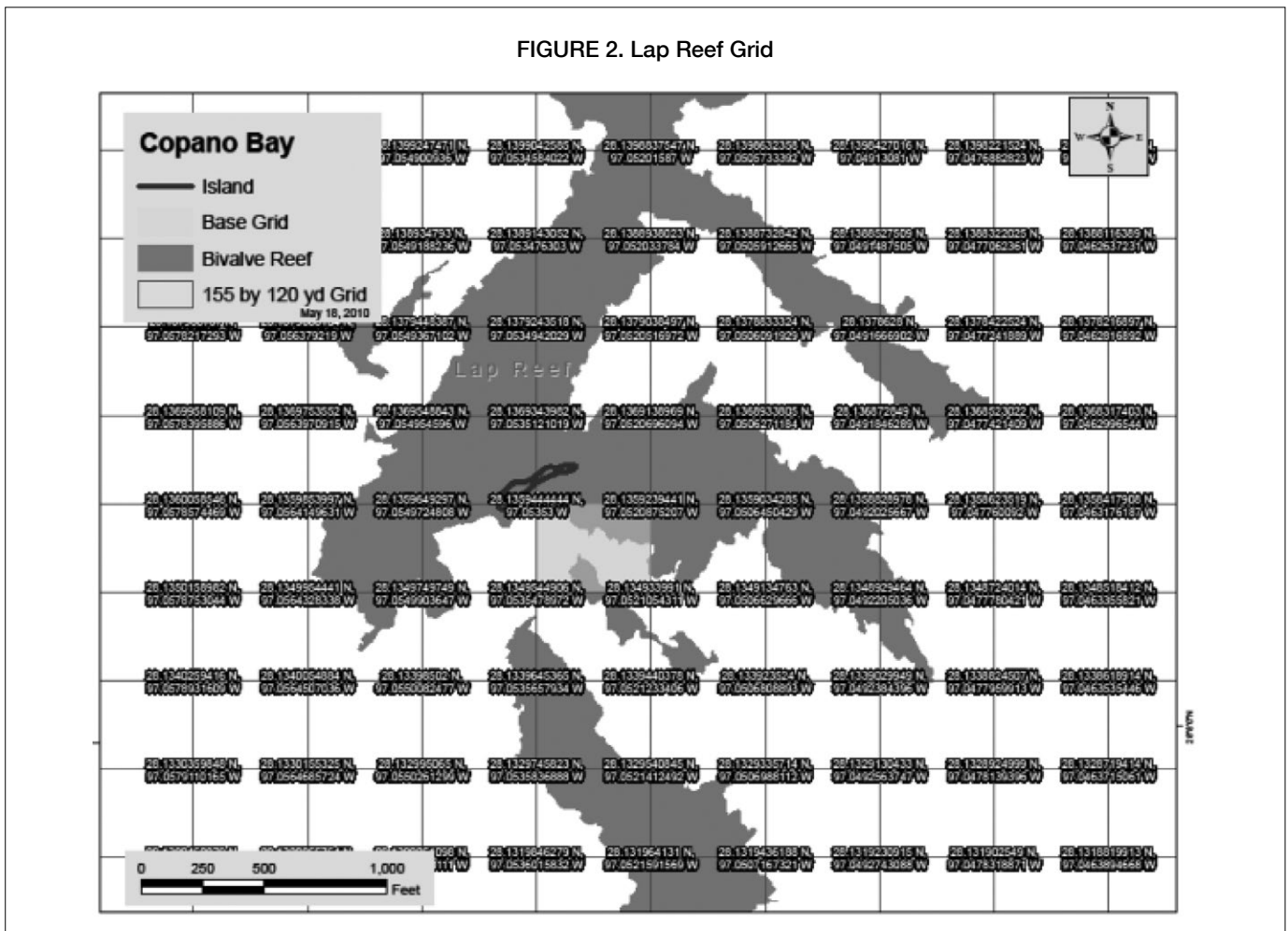
One challenge to oyster reef restoration is that the oyster shells will sink into the soft bay sediments. Coastal bays are composed primarily of clay and silt mixed with sand and shell fragments. The only natural hard bottom substrate to occur is provided by oyster reefs (Tunnel, and Dokken, 1996). Oyster reef development usually occurs on firm sediments, forming a small island of solid substrate. In order to successfully restore reefs it is important to build them on hard sediment, which can be done by assessing the sediment prior to reef construction.

MATERIALS AND METHODS

Study Design and Area

The proposed oyster reef restoration site is located at 28.1359445 N, 97.05353 W in Copano Bay, Texas, part of the Mission-Aransas Estuary. A 9x9 grid was constructed over Lap Reef, but only the inner 7x7 grid was used for sampling, providing forty-nine sampling stations.

Field and Laboratory Measurements

Penetration tests were conducted at every site to determine soil strength. A polyvinyl chloride (PVC) pipe (1 inch in diameter) was placed on top of the bottom sediments, and then pushed in to a depth of firm substrate. This measurement provides information about the soil's properties at each particular station. The results, however approximate, serve as useful guides to the ground conditions in those areas.

Using a 10 cm diameter core, sediment samples were also taken at each station and examined for Sediment Grain Size Analysis, which is a technique compiled by Rick Kalke. (His technique was compiled based on the work of Robert L. Folk, 1964, as described in Petrology of Sedimentary Rocks). A 20 cm3 sediment sample was mixed with 50 ml of hydrogen peroxide and 50 ml of deionized water in order to activate the digestion of organic materials among the samples. The samples were then wet sieved through a 62 μm mesh stainless steel screen using a vacuum pump and a Millipore Hydrosol SST filter holder to separate rubble and sand from silt and clay. After drying, the rubble and sand were separated on a 125 μm screen. The sediment samples were analyzed for percent contribution by weight of rubble, sand, silt, and clay. Following, 200 cm3 of sediment was taken from the soil sample and sieved through a 500 μm screen to separate the shell from sand, silt and clay. After drying, the shell was weighed to determine shell hash weight. The station number with location, depth, penetration, % hash, % rubble, % sand, % silt, and % clay can be found in Appendix 1.

Statistical Analyses

Principal Component Analysis (PCA) was used to assess relationships between five different sediment variables, penetration and water depth. When performing field studies, it is often difficult to interpret the results of multiple potential environmental physical-chemical factors (Montagna, 2000). The difficulty in this empirical approach arises primarily from two sources: environmental variability in each measured variable, and associating the multiple variables with statistical robustness. PCA is a multivariate method that is used as a variable reduction technique and will solve this problem (Montagna, 2007). PCA reduces a multivariate data set and creates new variables by extracting variance in order of importance. The analysis results in a new set of PC variable loading scores, and sample scores. The "loading" represents the underlying structure of the dataset, and the "scores" represent the contribution of each sample. The higher the absolute values of the PC loading scores, the more influence the variable has in the new PC variable. Results are presented in plots of the PC load vectors to aid interpretation of the underlying structure. Sample scores allow the visualization of spatial and temporal comparisons. Linear correlations, both on and off the proposed reef, were performed.

RESULTS

The first and second principal components (PC 1 and PC 2) for the sediment variables explained 74.7% and 10.6% of the variation within the data set (total 85.3%; Fig. 3). The PC 1 variable loads had the highest positive values for hash density and rubble and the highest negative values for depth, silt, clay, and penetration. This indicates that a decrease in depth, silt, clay and penetration is associated with an increase in hash density and rubble.

From the PCA results, the two highest scoring variables, shell hash density and percent rubble, were used to rank the different sampling areas (Fig. 4). The sizes of the circles in Fig. 4 represent the scores and the larger circles represent the more suitable areas for reef restoration. The areas with smaller circles or no circles at

all are less suitable areas for reef restoration. The arrow points to our proposed site for reef restoration. This location was chosen because it has one of the highest shell hash weights and percent of rubble and it is also located between two existing areas of reef.

The proposed reef restoration sites were chosen by taking the stations with the highest shell hash weight and highest percent rubble. To determine which one of these sites would be the most suitable, depth was taken into consideration which is shown in fig 5. The darker areas are deep and the lighter areas are shallow. A good site for oysters would be a place that is not too deep and not too shallow.

In order to determine the best site, several proposed reef restoration sites were chosen by taking the stations with the highest shell hash weight and highest percent rubble. To determine which one of these sites would be the most suitable, penetration was evaluated which is shown in fig 6. The darker areas have high penetration and the lighter areas have lower penetration. A good

site for oysters would be a place that is not too deep and not too shallow.
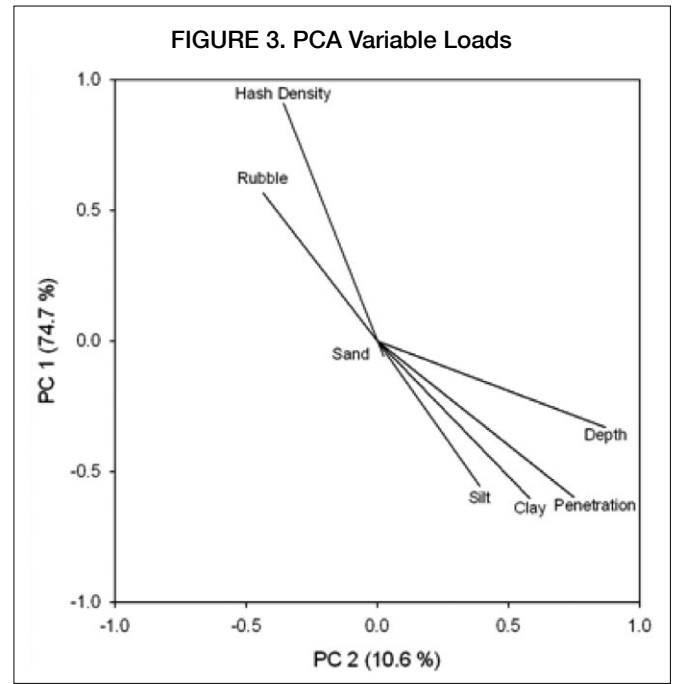

FIGURE 3. PCA Variable Loads

FIGURE 4. Proposed Area for Reef Restoration within Lap Reef.
The larger circles represent the more suitable areas for reef restoration.
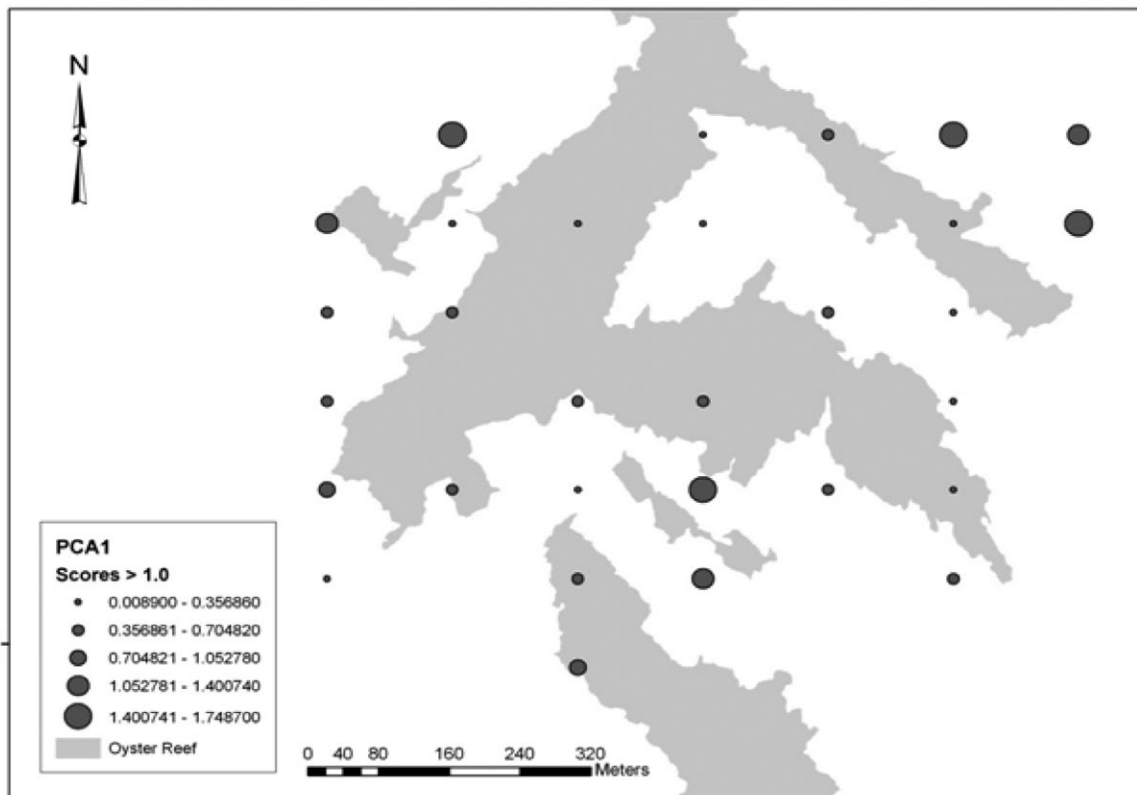
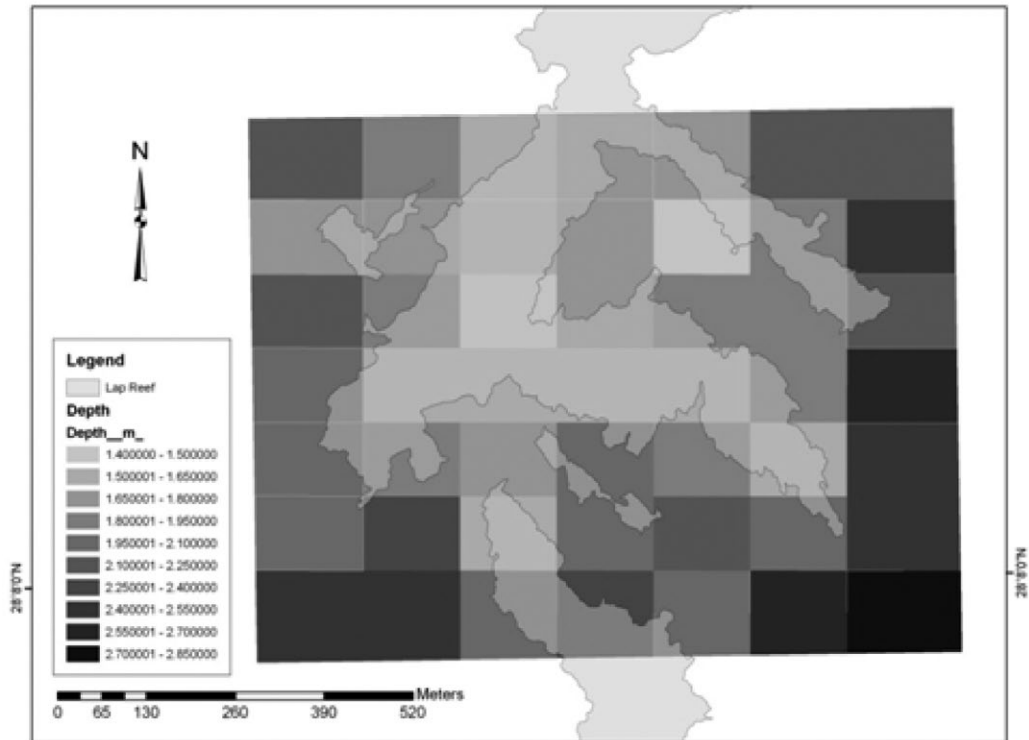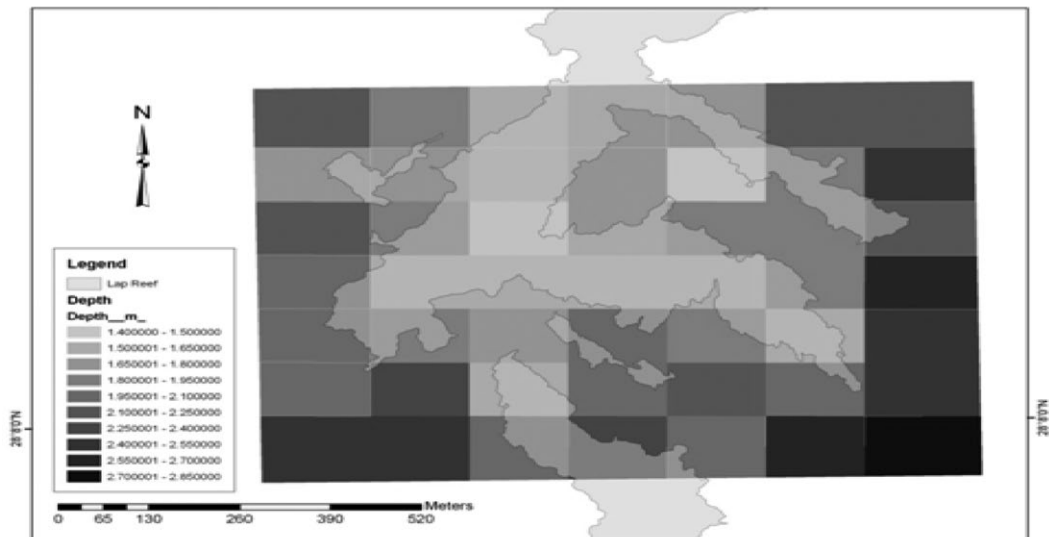FIGURE 5. Levels of Depth. The arrow points to the area chosen as the best site for oyster reef restoration.

FIGURE 6. Levels of Penetration. The arrow is pointing to the proposed site for oyster restoration.

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ALONG THE BORDER: THE STUDY OF THE SOUTH TEXAS BORDERLANDS AS AN INTERNATIONAL SPACE AND THE INTERACTION OF DIFFERENT CULTURES IN LITERATURE

by TABITHA PEREZ

ABSTRACT

The Southern Texas borderlands have been seen as an area with a predominantly Mexican population. The purpose of this study is to show how the Texas-Mexican borderlands are in actuality an international space filled with all sorts of various populations such as Anglos, African Americans, and Arabs, living alongside with Mexicans. By looking at this through literature, and through a historical perspective, the results show the borderlands as an area with an international population, and at the same time, the cultures are merging together. This discussion looks into how both contemporary authors and authors of early the 19th and 20th century show how the borderlands as an international space with the cultures coming together through their literary works.

INTRODUCTION

Concerning the Texas-Mexican border, people do not think of the various peoples that live in that region. It is not uncommon for people to assume that the borderlands are just an area filled with Mexicans. What people fail to realize is that it is in actuality, it is an area vastly populated with internationals. Authors of the 19th and 20th century such as Elena Zamora O'Shea (1935) Jovita Gonzalez (1926-1940s) and Sutton Griggs (1899) contribute to the international space by giving insight into how the internationals coexisted while having to come to terms with the fact that the land that the Mexicans so deeply loved was slowly being populated by Americans, with the borderline being drawn at the Rio Grande. Contemporary authors like Denise Chavez (1994, 2001), Benjamin Aire Saenz (2002, 2005), and Marian Haddad (2004) provide continuity into these issue. Historical authors like David Montejano (1987),

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Mario T. Garcia (1981), and Gilberto Miguel Hinojosa (1983) look more into how the populists coexisted when people were first moving into Texas. The film, "Lone Star," which was used for this study, looks into border tensions among the international populations. Jose David Saldivar adds, in his introduction of *Border Matters: Remapping American Cultural Studies*, an insight into the border cultures.

By looking at the context of these literary elements, the results reflect how the living in an international space and showing of the different cultures tear down the cultural and social borders while the natural, the Rio Grande, remains.

LITERATURE REVIEW

In order to better understand the issues that these authors take into account, it is important to first go back and look into what history has to say concerning the border as an international space and how the various populists coexisted. *Anglos and Mexicans 1836-1986*, by David Montejano, dives deeper into the history of Mexicans living in South Texas. From looking into the historical context surrounding the Texas-Mexican borderlands, David Montejano discusses how the border was a place where even in the 18th-19th centuries the mixing of the cultures was quite common. In the city of Laredo, he explains that "…The Americans and the European immigrants, most of whom were single men, married daughters of the leading Spanish-Mexican families and made Rio Grande City 'a cosmopolitan little town'" (Montejano 37). Right here lies the evidence of how the European settlers who settled in Texas crossed a racial "border" by marrying into Mexican families. Montejano explains that "There were neither racial nor social distinctions between Americans and Mexicans, we were just one family. This was due to the fact that so many of us of that generation had a Mexican mother and an American or European father" (Montejano 37). As this study will show later, marriage becomes a big topic in both the older novels and the more modern works of literature.

Mario T. Garcia in his book entitled *Desert Immigrants: The Mexicans of El Paso, 1880-1920*, discusses in one chapter entitled "Border Revolution," how that "…immigrants saw Mexico, not the United States, as their homeland" (Garcia 172)." This issue is part of the Chi-

cano Nationalism which takes place later in the 50s, yet, this was already being shown in the early 19th-20th century novels that will be discussed in this study. As such, the way that the population kept their ways of life alive was of course by keeping family values and religious traditions alive as the border began to move (Garcia 197-212). Garcia explains that "Cultural continuity as well as cultural change, the two in time developing a Mexican border culture, can be detected in the family, recreational activities, religion, and voluntary associations" (Garcia 197). For the purpose of this study, this will be further discussed in the novels like *Caballero* and *Dew on the Thorne*.

As Gilberto Miguel Hinojosa discusses in his book, *A Borderlands Town in Transition*, he discusses in one section of the book entitled "The Border Moves South" how the Americans occupied the borderlands. He discusses in this chapter of the book how the Ango Americans went about gaining control of the Rio Grande and setting it as the border between Mexico and Texas. With the Anglo population coming in, Hinojosa explains that "Within a decade of the first settlement in Texas, Anglo-Americans outnumbered Mexicans there five to one" (Hinojosa 48). This issue concerning the border is touched upon in the earlier novels written by Jovita Gonzalez. In the chapter entitled "Ethnic Divisions" in Hinojosa's book, he discusses some of the racial tensions in Laredo. This becomes important in Jovita Gonzalez's book *Caballero*, when the children begin interacting with the Anglo-Americans.

Jose David Saldivar's introduction to his book entitled *Border Matters: Remapping American Cultural Studies Saldivar* asks the question, "How do musicians, writers, and painters communicate their 'dangerous crossroads' to us?" (Saldivar 1). What this song talks about is an "undocumented Mexican father and his family" (Saldivar 4). The song contains lyrics such as "Listen, son, would you like to return to live in Mexico? What you talkin' about, Dad? I don't wanna go back to Mexico….My children don't speak to me. They have learned another language and forgotten Spanish. They think like Americans. They deny that they are Mexican even though they have my skin color" (Saldivar 5). What this song shows is how the father, who is Mexican, realizes that his son doesn't want anything to do with Mexico; he has become Americanized. What Saldivar's introduc-

tion offers to this study, is to show the Americanization that is emphasized in the novels like *Dew on the Thorne* and *Caballero*. Later, this study will show how Marian Haddad, an American born of Syrian parents had to reconcile her Syrian culture with her American life among the Mexican population in El Paso, Texas.

RESULTS

Looking into how the older novels represented the borderlands as an international space, this study looked into the works of Jovita Gonzalez, Elena Zamora O'Shea, and Sutton Griggs. Jovita Gonzalez's novels add to the idea that the Mexican borderlands is an international sphere because she emphasizes in her novels marriage and merging of cultures. O'Shea adds to this idea by telling the story of Palo Alto, a tree who "observes" the different populations coming to her beloved Texas, and Sutton Griggs gives an insight to the African American population in Texas.

Gonzalez's *Caballero* was written during the 1930s and 40s. It takes place in the year 1846-1848, 10 years after the battle of the Alamo. *Caballero* opens up with Santiago de Mendoza y Soria admiring the hacienda that he has inherited. What Gonzalez explores in her novel in terms of the merging of the cultures are the problems that were raised in the 19th century Texas-Mexican borderlands. Don Santiago, much to his dismay, finds out that Texas is no longer part of Mexico; they [the Mexicans] are now "Americanos." Gilberto Miguel Hinojosa, author of the historical book entitled, *A Borderlands Town In Transition*, discusses the issue of the border moving in the chapter entitled "The Border moves South, 1835-50." What Hinojosa discusses here is the city of Laredo, a bordertown. Hinojosa explains that "Texas claims to the Rio Grande as the western and southern boundary of the state were never seriously considered by Mexican officials. Lands along the Rio Grande belonged to the States of Nuevo Mexico, Coahuila, and Tamaulipas" (Hinojosa 49). Furthermore, Hinojosa adds that "hopes of fully controlling both the overland and Gulf routes by acquiring jurisdiction over the two points of entry into northern Mexico helped inspire the Texas claim to the Rio Grande" (Hinojosa 49). While the fate of the border may sound grim for the characters of *Caballero*, it does bring in a positive outlook for the younger generation in the novel. Gonzalez's characters such as Susanita help add to the international sphere by her having feelings for an "Americano." Despite her father's hatred of the "Americanos," she ends up falling in love with Robert Wallace, a man from Virginia. Despite the fact that she has been told that the Americanos are barbarians and are not the children of God, since they are not Catholic, she ignores all of this, and gives into her emotions. What Gonzalez is showing here is that Susanita has figuratively and quite literally crossed borders. First, by now living in America, since the Rio Grande is now the border at this time, and by crossing racial borders with Robert Wallace, whom her father dislikes.

Another way that this book helps contribute to the international space example as observed in this novel is with the French priest, Padre Pierre. Don Gabriel, a friend of Don Santiago, explains that Padre Pierre, "… has not the proper distrust of the Americanos. These French priests are too liberal….he is very firm that they [the Americanos] be allowed in church" (Gonzalez 43). Here, Gonzalez is showing how this priest really has no fears of the Americans and that he is willing to allow the cultures to mix, even going so far as to having Americanos attend mass. This is what his main objective is: to merge the Anglo and Mexican cultures together. As he explains in the meeting with Don Santiago and the rest of the Dons: "Seek the Americano officials who have influence and invite them to your homes and entertainments. Show them that we have much to give them in culture, that we are not the ignorant people they take us to be, that to remain as we are will neither harm nor be a disgrace to their union of states" (Gonzalez 54). He is hoping that the internationals can coexist with one another. As Hinojosa explains in another chapter entitled, "The 1850s, a Decade of Change and Adjustment," of *A Borderlands Town in Transition* he says that "Local tradition maintains that the Europeans got along better with the Mexican population and formed closer bonds with them than the Anglo-Americans" (Hinojosa 80).

This explains more as to why in *Caballero* the Mexicans trust Padre Pierre and really don't get along with the Anglo Americans. Padre Pierre even encourages these men, who are ready to go to war against the Americans, to learn their language. He wants them to make friends and to show them that they intend to be good "Americanos." Of course, they all refuse. They feel that

they have been stripped of their identity and refuse to immerse themselves in the American culture. Gonzalez uses the character of Padre Pierre to show how he is willing to become a part of the American culture. He is accepting the fact that Texas is now a part of America and he wants the former Mexicans to embrace the culture, thereby adding to the international sphere.

Gonzalez also adds more to this idea by showing the merging of the cultures through Luis, Don Santiago's son as well. Gonzalez displays this through Luis' love for art. He makes friends with an American soldier named Delvin who is amazed by his art work. He explains to Luis that contrary to what the Mexicans have been taught, the Americans do have art work and that Baltimore, Maryland is the best place for it. He explains that "….Maryland,-Mary's Land, named after the same Blessed Virgin, Mary the Mother of Christ, whom the Mexicans venerated. Of Lord Baltimore who founded the colony so that, in a new land, Catholics might worship free from persecution" (Gonzalez 106-107). Gonzalez is showing here through an unlikely friendship between the an Anglo and a Mexican how both cultures which are at odds with each other can come together; their cultures can merge, in this case through art. Unfortunately, Luis' pursuit of art and acceptance of Delvin's help becomes problematic with his father Don Santiago, and in the end, he is cast out. Gonzalez is showing in her novel how the younger generation like Luis and Susanita are not afraid to embrace the Americano culture. Despite what their parents and elders tell them, they want to give in. They want to "cross" the racial borders that have been bestowed upon them. For the older generation, there is this constant fear of losing their identity, their culture, land, and way of life. For Padre Pierre, he does not see this as problematic. Rather, he sees it as a chance for the cultures to be brought together. For the older generation, giving into the American culture means having to give up what that they have held dear: their identity. In order for everyone to add to the international sphere, the populations have to learn to coexist, and allow the cultures to mix.

Similar to *Caballero*, *Dew on the Thorn*, also by Gonzalez, focuses on the Olivares family and their lives on the border. Like *Caballero*, this novel, too, shows how marriage between different races adds to the international populace. However, it shows a darker side to it.

She explains how "…Americans, Germans, and French intermarried with the descendants of the old Mexican families" (Gonzalez 11).The children are marrying into French and German families, showing how the international relations are coming into place even in the early years of Texas. The character Don Francisco witnesses his daughters marrying outside of their race and having families with them. One character in particular, named Don Alberto, is called to teach Texas-Mexican students, "the spirit of their race" (Gonzalez 144). He wants them to still keep their Mexican roots and remain loyal to them. He wants them to keep their traditions alive. Mario T. Garcia, author of *Desert Immigrants*, talks about how despite the fact that Mexicans lived among other internationals, they wanted to keep their traditions alive. For example, food is one tradition Mexicans want to keep alive. Garcia points out that one woman explained "I don't suffer in the matter of food, for my mother cooks at home as if we were in Mexico….we generally eat Mexican style and rice and beans" (Garcia 203). Also traditions such as telling oral tales like La Llorona,and attending Mass and Sunday band concerts (203-206) are some of the things that the Mexicans kept alive while living in an area populated by other internationals. However, Don Alberto from *Caballero* does not want the cultures to merge. He is afraid of the students losing their identity. On the other hand an example of Mexicans and Americans coming together is the marriage of Don Francisco's brother, Fernando, to a woman named Isabel, whose father, Juan Preston, is an American. Their child, Fernando II, though he is half American is raised to be a "caballero." As he grows up, he is anxious to know his American roots. Unfortunately, he is not welcomed by them. Gonzalez describes this when she writes, "The fact that his family had been in the country for five generations meant nothing to these Americans…In their eyes, he was just a Mexican" (Gonzalez 151). He encourages his family to send the children to American schools, to have them learn English in order to make it in America. Like in *Caballero*, Fernando II wants the cultures to merge together, to see them be one with the Americanos. He wants them to be active participants in the international sphere. Gonzalez shows how even though the border may have moved; the Mexicans do not feel like they are foreigners. To them, it is still home. Still, they have to go through the barriers of coming to terms with the fact that they are

living in America. Fernando II realizes this. Though he has been raised a "caballero," he still wants to know his American roots. Though he is shocked at how he is treated by the Americans, he feels that it is his job to show the rancheros that they are Americans. Though the merging of the cultures is dominant, the Olivares still want to keep their identity. Chicano Nationalism, while still a thing of the future during this time, Gonzalez is showing the beginnings of it. Dona Margarita exclaims at the end of the novel, "Texas is ours. We stay," (Gonzalez 179), shows an example of Chicano Nationalism. At the same time, the story shows that though the Americanos may come and mix with them, they are still Mexicans at heart. To them, the merging of the cultures means nothing.

As for Elena Zamora O'Shea's *El Mesquite,* this novel is told from the point of view of a mesquite tree named Palo Alto. Palo Alto observes the changes of the border and serves the Spaniards and the Mexicans and "sees" how the land changes when the Americans come over. She notices the changes that are brought into the international space of the borderlands. Palo Alto explains that "I was a Mesquite to the Indians, a Mesquite to the Spaniards, and to the Mexicans, but I am Mesquit to the Americans" (O'Shea 61). She has seen how the shifting of the physical border, from the Nueces to the Rio Grande, has brought change. In her later years she observes that "These girls ride differently from the women of my early times. At that time they rode on a saddle with three horns….Now they ride like men" (O'Shea 74). Not only does this show the changes of time, but how bringing the borders and cultures together have influenced the Mexican girls to ride full saddle. She also explains the dances that they attend and how they play "all kinds of music" (O'Shea 75). This implies that it is not just Mexican music that is played at their dances. What really shows how America has taken over is when O'Shea mentions that the students sing "My Country 'Tis of Thee," an American patriotic song. This is something that of course would not be sung had the cultures not merged and if the border hadn't changed. Also, it goes back to how the borderlands is now a shifting international region, where Americans are populating the area more and more. Palo Alto points out that at Fiestas, the Mexicans and Americans are sharing and eating tamales. O'Shea shows these types of things to emphasize

how the world really has changed around Palo Alto and the cultures have come together, the borders have been crossed. The significance of Palo Alto in terms of nationalism is that like the Mexicans, Palo Alto favors the land that she has always called home. Just as the characters in *Dew on the Thorn* and *Caballero* loved their land that they believed was taken from them, Palo Alto still sees the borderland as her land, despite the fact that the Americans have taken over. This echoes the Chicano Nationalism in the previous novels and explains the fact that the Mexicans may be living among different internationals, but to them it is still their homeland.

Another population that was affected by the borderland were African Americans. Author Sutton E. Griggs' "Imperium in Imperio" show the sort of discrimination that African Americans faced. Belton, who is African American, wants to form his own empire, called the Imperium. He feels that it will help the African Americans. His friend Bernard who he appoints as president decides that instead of being a peaceful empire, it will militarized. He wants to take back what he believes is theirs. Similar to the Mexicans, the African Americans in this story feel they've been cheated by the Anglos. Merging of the cultures is not an option. They want to use violence against the Anglos. What this novel also shows is the problems of creating an empire within an empire. Historically, the slaves were brought to America through the Trans-Atlantic Slave trade sending them to the United States. By creating this "empire within an empire," they are only turning into the ones who have enslaved them all this time. This focuses on a different population in the Texas-Mexico borderlands that is often overlooked. This also adds to the idea that the borderlands are an international space, since the African-Americans were literally brought over here, thereby, contributing to the international population.

Despite the obvious differences between the older novels and the more contemporary novels, the more recent works do provide some form of continuity in terms of marriage, race, identity, and they also go deeper into the tensions of living in an international space such as the Texas borderlands.

For author Benjamin Alire Saenz his novel *In Perfect Light* contributes to the international sphere and continuity, of course, through marriage. Just like in Jovita

Gonzalez's novel *Caballero,* the mixing of the races still applies even in the contemporary setting. Mister, one of the main characters of the story is married to a "gringa" as his wife is referred to in the novel. He and his wife desires to adopt a child named Vincente. Upon request, he asks to meet with Vicente's birthmother. Upon meeting her, she observes that he [Mister] is an "Educated Mexican who looks and acts more American than most gringos. And you [Mister] speak Spanish" (Saenz 88). She even asks him if he is married to a "gringa," to which he says yes, and she explains that Vicente's father is a "gringo." Here, Saenz, as in Gonzalez's *Caballero*, shows how the Mexican-Americans have come together not just through marriage, but also going so far as bringing a child of mixed race into the family, going along with the notion of hybridity. What this also points out, is that Mister doesn't fit the Mexican stereotype. He is educated and has become "Americanized," which is what the characters in *Caballero* and *Dew on the Thorne* feared for the younger generation. However, him being "Americanized" is accepted in this novel.

As for the novel's main protagonist, Andres Segovia, he struggles with his identity. Having been brought up along the border, he is faced with a family tragedy prompts his older brother Mando to move Andres and their two sisters to move away to Juarez, fearing that social services will separate them. Andres finds himself in a world that is completely foreign to him. Later, he is forced into prostitution. Though he is able to escape that life years later, he is still haunted by his past. When he moves back to the states, he becomes a criminal by killing the man who would molest him as a boy. In order to escape his pain, he finds himself running away from his problems by finding himself standing on the Santa Fe bridge. He his literally stuck between two borders: the U.S. and Mexican. He has no idea where he belongs anymore. As for the mixing of the cultures Andres and his siblings have to reject the English language and learn to speak Spanish in order to adapt to their new way of life. Whereas in the novels *Caballero* and *Dew on the Thorne*, the characters struggle to keep their identities, Andres struggles with finding his identity in two countries where he is not accepted.

Saenz also discusses border issues in his book of poetry entitled *Elegies in Blue*. For example, in his poem entitled "The Rags of Time on Rio Vista Farm," He is giving the workers on the farm a voice, something that they didn't have all those years ago. Saenz observes in the poem:

"Mexicanos by the hundreds, by the thousands, their Spanish flooding empty rooms like water floods the filed in early spring. With dreams, came because they dreamed. We brought them for their backs….eagerness to work…Then hated them, and put up signs to keep them out of places where we dined…." (Saenz 10).

He is explaining how even though they were so eager to come over to work, they were hated. Though people wanted them to work their land, at the same time they were exploited. In another poem entitled "The Boy Who Wants to know Names," Saenz discusses how a boy who is in a grade school in a "desert town" (14), is taught names like George Washington, Betsy Ross, Thomas Jefferson, etc. (Saenz 14.) These are the "American" heroes that children are taught in school. As Saenz later discusses in the poem, the child learns the term "Un-American." He finds out that he is "Un-American" because he is Mexican. In one other poem entitled "What was it all for anyway, Cesar, Cesar, Cesar Chavez?" Saenz is asking Cesar Chavez if it really was worth fighting for civil rights. His poem, "At the Graves of the 20th Century" he talks about the Mexican hero, Pancho Villa and his legacy. He says in the poem,

"Except you [Pancho Villa] knew that Mexico belonged to those who worked the land. The rich you sent to hell where they belonged. You loved that fight" (Saenz 76).

He is discussing on how Villa fought for the poor and how the people loved him. The final line of the poem which states, "Listen Villa, your people are still poor Villa if you would rise again" (Saenz 78).

He wants his legacy to never be forgotten. Later in the poem "At the Grave of Juan Lucero Saenz," Saenz talks about his grandfather. The poem opens up with the lines "El Polvo, the place of your birth. They've renamed it Redford. 'Bueno, los gringos cambian todo" (80). Just like in *Caballero*, the characters feared that the Anglos would take everything from them. Saenz' poem confirms that, in a sense, the Anglos have, even going so far as renaming El Polvo, Saenz's grandfather's hometown. He goes even further and talks about the issues of the border. "People crossing back and forth, a daily ritual. Like morning Mass. In your boyhood, the river

was a river. Not a border" (Saenz 81). Just like in the older novels like *Caballero*, *Dew on the Thorne*, *El Mesquite,* the characters lived in a time where there was no border; Texas was still a part of Mexico. There was no division, as Saenz explains in this poem. This also goes back to his novel *In Perfect Light* when Andres crossed the border when he was running away from his pain. To him, it really is just a daily ritual.

Author Marian Haddad, who grew up on the border, is a child of immigrant parents who came from Syria and lived in El Paso, Texas. She was the only child to have grown up in America. What she contributes to the international space is her Syrian heritage. For the purpose of this study, an interview was conducted, with her permission, to help understand more about what it was for her as an Arab-American growing up alongside Mexicans. For the characters in Gonzalez's works, they felt like the border hindered them. For Haddad it was a different story. She explains,

"That border gave me another country! It was five minutes away from us we went to Juarez. It was a time for us to become immersed in a third way of life. I found that the Mexican heritage is similar to the Middle Eastern heritage. Lots of family, vibrancy, lots of celebration. It was a joy to find similarities between America and Mexico in that way, and that there were similarities between the Mexican and Middle Eastern Traditions. To me, the border was a connecting line instead of a dividing line. The border gave us the Mexican language, the culture."

As Haddad explains, the border did not divide her or her family. It gave them a connection with the Mexican populations. She also explains that *"El Paso is bicultural. It's not like we have Mexican Americans that live there. You are speaking English and Spanish in the same sentence."*

Just like in *Caballero*, Susanita wanted to be with someone who was outside of her race, Haddad encountered this when she was growing up.

"I felt like, "Well I want to date." And in my family, you really didn't date unless you were going to marry the guy. I just wanted to go to the prom! So, my older sister said, "Well bad luck," or something like that. But I always asked! So he (my father) had to deal with me because I was the American child who wanted the American things."

Despite all of this, Haddad and her family were able to keep their Syrian traditions alive . One example is through the food. She explained how her mother would prepare it.

"Oh. She made Arabic bread, burritos, and enchiladas. She didn't make tortillas, but God bless her. She would make 200 loaves of Arabic bread. Have you ever tasted Arabic bread? It's fantastic. It's the size of a pizza dough, but like pan pizza. She and my grandmother would make 200-300 loaves and they would freeze them. She always ran out for her burritos, enchiladas, and tacos. She made those more then she made Arabic food! Why? Because of the border!"

Since she and her family were living among other internationals, Haddad and family embraced the Mexican tradition: dancing. As she enthusiastically explained,

"Dancing in the backyard, having parties till 2 in the morning. Celebrations! Music! Constant music! When we had company over, we would just put music on! We were always singing and dancing. So were our Mexican neighbors! There was always music, there was always food, there was always plenty."

She also explained that other similarities between the Syrian and Mexican cultures were the singing, dancing, and constant celebration. They also kept other traditions as well, like speaking Arabic and playing Arabic music.

"Well, we spoke Arabic, that was the main language of the house. More then English. I spoke English in school, like I didn't have an Arabic accent. Then I spoke Arabic at home, like I didn't have an American accent. I learned both languages at the same time, but Spanish came later. So that tradition. The same answer for the similarities. We always had Arabic music on, we kind of like had an Open Mic at the house."

Through her answers, she contributes to the international space due to her heritage, and at the same, she embraces the Mexican culture and is able to find similarities, despite the fact that she is Arab-American. In the other novels where characters don't want to be involved in the international space and want to keep their identity, Haddad has founded a new identity and embraces the international space due to her Arab heritage.

Just like the way Haddad grew up in the international space and how the cultures came together for her, the film entitled "Lone Star" directed by John Sayles looks into these issues too. The use of this film provides a more visual perspective on life in the Texas borderlands and a view of how the different internationals coexist in a contemporary form of medium. The film, starring, Chris Cooper, tells the story of a sheriff named Sam Deeds (Chris Cooper) who is trying to solve the 40 year old murder of Sheriff Chris Wade (Kris Kristofferson). Though this film appears to be a murder mystery, on a deeper level, it shows how the border really is an international space and it shows how the different live together side by side.

For example, Pilar (Elizabeth Pena) is a school teacher in Rio County, who at one point in the moving is attending a meeting with the other teachers on how to teach History. Some teachers argue that putting down the Anglos for what they did to the Mexicans hundreds of years ago is not fair for the Anglo students. Other teachers explain how it's important to teach about the Alamo and what happened and not leave those parts of Mexican history out. Pilar argues that it is important to teach the bigger picture.

Pilar's mother, Mercedes Cruz runs her own restaurant and her employees are illegal immigrants from Mexico. She is always constantly telling them to speak English, they live in America and she believes that they need to learn it.

Other issues shown in the film are the other inhabitants in Rio Country, such as the African Americans that live there. For example, in one of the film's flashbacks, when Otis, (owner of Otis' Bar) was younger, he encountered Sheriff Wade at the bar that he [Otis] was working at. While serving him a beer, Wade demanded Otis to actually pour the beer in the glass instead of just giving him the bottle with the empty glass. Since this scene in the movie took place when African Americans were still fighting for their rights, it is no wonder that the film shows Wade pointing a gun at Otis' head, threatening to kill him.

Later, Otis owns his own bar where all the African Americans come together and they can mingle with each other. Otis' grandson also becomes interested in his family history and discovers that he is part Native American. Even Pilar's son, Amando, is interesting in his Mexican roots.

At the same time, the film also shows the darker side to living on the border. The film shows flashbacks of Sheriff Wade killing illegal immigrants with no warning and even trying to kill Otis when he was young. Like *Elegies in Blue*, the film shows the racism that some of the inhabitants of the borderlands face. This film contributes to the international space because it shows Anglos, Mexicans, and African Americans coexisting along the border, and at the same time, shows the tensions that still exist there even after novels like *Caballero* and *Dew on the Thorne*, were published. It shows that some of those tensions never really go away.

In Denise Chavez's novels *Face of An Angel* and *Loving Pedro Infante*, she provides an outlook for the international populations by looking into people that are of mixed race in her works. For instance, Soveida Dosamantes, the main character in her novel *Face of An Angel*, is a waitress in New Mexico and talks about the customers that she serves who range from Chicanos and Native Americans, to Anglos. This shows the different cultures coming together, eating together, and how they interact with each other.

Also, Chavez focuses on Oralia, the Dosmantes' servant. Soveida talks about how Oralia was always making Mexican food and when she was teaching her how to make tamales, Sovieda cried "Who cares about making tamales? We're Americanos!" (139 Chavez). Oralia's reply was "You may be an American in your little finger, but the rest of your hand is brown like mine" (139 Chavez). Similar to the film "Lone Star" where Mercedes Cruz wants her employees to speak English, Oralia wants Soveida to give in to her Mexican heritage. In the older novels, the characters wanted to keep certain traditions alive, and Oralia is doing the same thing with Soveida. It's as if she doesn't want those customs to be forgotten. Once again, the continuity from the older novels, where the characters wanted to keep traditions, is echoed in this novel.

Another interesting idea that echoes into the contemporary novels are the ideas of marriage. In *Caballero* for example, Don Francisco did not want his Susanita to marry Robert, who was from Virginia. In *Face of An Angel*, marriage between people of different races is still

a major part even in the contemporary novels. Larry, for example, who works at the restaurant with Soveida, has fallen in love with an Anglo woman named Bonnie. Bonnie desires to speak English so she can communicate better with her new in-laws. Larry sees this as outrageous. He explains, "Everyone speaks English, this is the U.S.!" (Chavez 149). Since he doesn't speak Spanish he doesn't see why she should bother to learn. When they marry, she runs the restaurant and Larry struggles with his Spanish. He is dubbed a Spanish white man. In Soveida's case, when she marries again, it is to a "gringo" named Veryl. Unfortunately, he kills himself and is buried in San Pedro Cemetery. He is the only "gringo" to be buried there. He is buried in a land that is completely foreign to him. Sovieda also celebrates El Dia de Los Muertos, a holiday that is celebrated by Mexicans. To help her grieve the loss of her husband, Soveida finds herself taking a Chicano class at a local college. When her brother Hector finds out, he just ridicules her, and she fires back at him that he is racist against his own race (Chavez 284). She even interviews Oralia for her school project and finds out that she is Indian/Mexican. Chavez writes in the novel that "She [Oralia] as a result of her heritage unites her worlds….She is a bridge between cultures, languages, and beliefs" (Chavez 307). This shows an example of an international person that is living in New Mexico. What's interesting here is that Chavez uses the word "bridge" when she is describing Oralia. Oralia is seen as a "bridge between cultures" (Chavez 307). The Santa Fe Bridge, which is discussed in Saenz's *In Perfect Light*, really is a bridge that is between cultures, the Mexican and the American culture.

In *Loving Pedro Infante*, Chavez talks about Tere, a woman who is obsessed with the late Mexican actor, Pedro Infante. Pedro Infante, to Tere, symbolizes the perfect man, which is what Tere struggles to find in the novel. What this novel shows, as in the film "Lone Star," is how there are different races along the border, adding to the international sphere of the region. For example, Tere's compadre points out that "Mejicanos" look like either Japanese, Indian, etc. Irma explains that "They're a resounding case for the world's long-standing mestizaje, the mixture of many people's blood" (Chavez 21). This shows how the cultures have mixed together; the notion of hybridity comes into place here in this novel. Tere makes excellent observations from watch-

ing Infante's films by noticing that some of the actresses in the films are blonde. Tere explains that "One day I started noticing that most of the heroines and leading ladies were rubias, blondes real or not real, but blondes" (Chavez 48). What this shows is a sign that she notices the mix races that are put on display in the films.

She also explains how the cultures have suffered from too much translation. For instance, Tere explains that that is why her generation has Chicanos named Butch, Sonny, Jennifer, Vanessa, and Shirley. She can't understand what happened to names like Neria, Esmerelda, and Maria de la Luz, Angela de la Luz, Reina, Altagracia (Chavez 52). The answer: the cultures merged.

When Tere talks about her lover, Lucio, she describes him as "…more Americano than Mejicano. No one taught him who he really is and who his people were and are" (Chavez 88). She also talks about a store that is run by Koreans and how they wave the Korean flag. This displays a loss of culture and at the same time, when she talks about the Koreans running a store in her home, it shows how the border has so many different types of races living there.

In terms of races, Chavez explains how in the novel, Tere and her cousin Ubaldo are walking in a park called Adams Park, which is named after an Anglo man who didn't even live in their New Mexico town. He is described as "…someone who had grown up here speaking Spanish with his Mejicano friends. He loved the food, the culture…" (Chavez 132). He wanted to help the "blacks, whites, Asians, Mexicans" (Chavez 133). Similar to Haddad, Adams grew up around Mexicans and embraced their culture. Haddad's family who is Syrian did the same thing when they came to live in El Paso, Texas.

Of course, with these cultures there are bound to be clashes which is what Tere experiences with Irma when they go out drinking with two men who are of Spanish descent. To Tere, her response to all these culture clashes is, "Who do they think they had babies with? What are we but a mestizaje, a mixture of all people in the world?" (Chavez 186). Even at the Pedro Infante fan club meetings, the members discuss the use of African Americans in the movies and whether or not it is proper for them to be in the films (Chavez 241).

Similar to the film "Lone Star," Tere goes to a restaurant called "The Border Cowboy Truck Stop," and she notices that the workers there are illegal immigrants. They've crossed over to find a better life.

Just like in the previous novels, marriage comes into play in this novel. Tere's friend Irma falls in love with an Anglo man named Mr. Welsey. Their marriage shows the two cultures and two families coming together, they are figuratively crossing borders through their union. The Mass is bilingual and their vows are in English and Spanish, showing the cultures coming together (Chavez 308).

This book offers marriage as a huge contribution to the international sphere and how the cultures are continuing to blend just like they were in the older novels.

CONCLUSION

In conclusion, both the older and contemporary novels provide some continuity in terms of the issues concerning how the borderland is an international sphere. With the issues such as marriage, identity, mixing of cultures, and tensions, it is apparent that these express all of these. Films like "Lone Star" contribute to this, and author Marian Haddad experienced it first hand as an Arab-American. Though tensions still remain on the borderlands, it is through the older and newer works that all of these are expressed.

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CONTAMINATION LEVEL OF FISHES IN THREE TEXAS ESTUARIES

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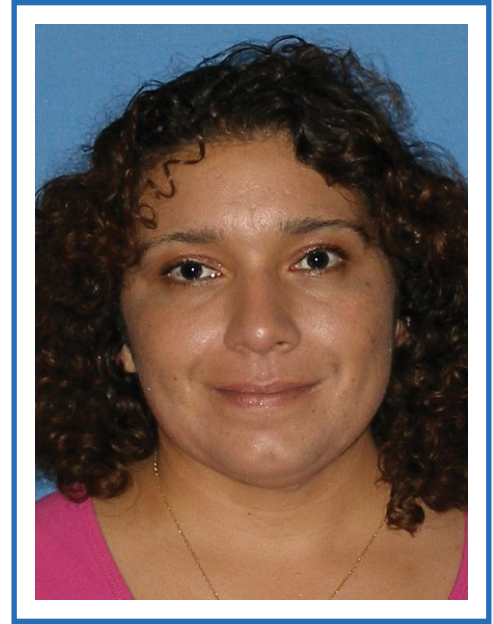
ABSTRACT

As of 2006 there were approximately 1.2 million saltwater anglers in the state of Texas. With so many anglers catching and consuming fish, there is a growing concern about contaminate levels of mercury and other toxins in these fish tissues. The purpose of this study was to identify the levels of mercury, polychlorinated biphenyls (PCB's), and dioxins present in black drum (Pogonias cromis), red drum (Sciaenops ocellatus), and spotted seatrout (Cynoscion nebulosus) in the Upper Laguna Madre, Corpus Christi, and Aransas Bay systems in Texas. These three fish are regularly consumed by recreational anglers and contaminates in the fish tissue may pose health threats to humans if consumption levels surpass EPA thresholds. White epaxial tissue was collected from four fish of each species in all three bay systems, for a total of thirty-six samples. Tissues were frozen at -20°C until they were shipped for analysis. These samples will be sent and processed at the Geochemical and Environmental and Research Group (GERG) at Texas A&M University. Currently, 33 samples are ready for processing. Three black drum from Aransas bay remain outstanding.

INTRODUCTION

As of 2006 there were approximately 1.2 million saltwater anglers in the state of Texas (*Fisheries Economics of the U.S., 2006*). With so many anglers consuming fish, there is a growing concern about the contaminate levels found in fish tissues, and the contamination levels in the Coastal Bend area of South Texas are unknown. Mercury, polychlorinated biphenyls (PCB's) and dioxins are compounds that are known to bioaccumulate in fish, and biomagnify through the food chain, and high levels of these contaminates can pose significant health risks (Chien, Gao, and Lin, 2010; Harris and Jones, 2008; WHO, 2010). Mercury, PCB's, and dioxins are all lipophilic compounds which have a tendency to attach to lipids in the body and metabolize at a slow rate. When the rate of ingestion exceeds the rate of elimination then the compounds accumulate within the organism, leading to bioaccumulation. Biomagnification occurs when organisms that have bioaccumlated contaminates in their tissues are consumed by higher trophic level organisms, which increases the level of contaminates in these large fish. The amount of contamination in the tis-

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sues of these large fish is then significantly higher than the surrounding environment (Gray, 2002).

Fish consumption is considered a pathway for exposure to mercury, PCB's and dioxins (Chien et al., 2010; Harris and Jones, 2008; WHO, 2010). Approximately 10,000 tons of mercury naturally occur in the atmosphere with anthropogenic activities contributing an additional 20,000 tons/year. The most prevalent anthropogenic source is coal smoke released into the air from coal-fired plants. This mercury eventually makes its way into the marine environment, where it is microbiologically transformed into methyl mercury (Sager, 2002; Zahir, Rizwi, Haq, and Khan, 2005). Methyl mercury ingestion in humans is a health hazard and can lead to various problems as the compound can penetrate the blood-brain barrier resulting in damage to the central nervous system; this is most evident in developing fetuses. The development of organs and nerves is greatly impacted by this exposure and can lead to developmental problems in young children (Chien, Gao, and Lin, 2010; Sager, 2002).

PCB's can cause similar problems by affecting the cardiovascular system, liver, and skin. They are considered probable carcinogens in humans and can pass through the placenta and affect the development of fetuses. PCB's can also pass through breast milk and may affect the development of infants and young children (Harris and Jones, 2008).

The term dioxin typically refers to polychlorinated dibenzo para dioxin (PCDD's) and polychlorinated dibenzofurans (PCDF's). These compounds can disrupt the immune, nervous, endocrine, and reproductive systems and are known carcinogens (WHO, 2010). PCDD's and PCDF's are produced through human activities such as metal smelting, the combustion of chlorine containing compounds, refining, and chemical manufacturing. The compounds are typically released into the atmosphere where they are then deposited on soil and aquatic environments thus entering the food chain (Zhang et al., 2009).

The purpose of this study is to quantify the levels of mercury, PCB's, and dioxins in the tissue of common recreational fishes that are consumed by local anglers in South Texas. Legal-sized black drum (*Pongonias cromis*), spotted sea trout (*Cynoscion nebulosus*), and red drum

(*Sciaenops ocellatus*) were tested because these are the most common fish consumed by anglers in the upper Laguna Madre, Corpus Christi, and Aransas Bay systems. Specifically, we tested the hypotheses that larger fish will contain more contaminates, that the level of contaminates will vary between species of similar size due to various feeding habits, and that the contamination level will not vary significantly between bay systems. The data collected will be used to notify Texas Department of State Health Services (TDSHS) should the levels of contaminates found exceed safe thresholds determined by the EPA. The data from this study will be used by TDSHS to determine if further investigation is required prior to notifying the public of unsafe levels of contamination.

MATERIALS AND METHODS

A sample of four fish from each of three species, black drum, red drum, and spotted sea trout, were collected from the Upper Laguna Madre, Corpus Christi, and Aransas Bay systems (Fig. 1), for a total of 36 fish. The fish were collected with rod and reel using artificial and live bait, which allowed for the collection to be species specific and the targeting of fish sizes in accordance with Texas Park and Wildlife Department regulations (TPWD). The following environmental factors were measured when applicable: air temperature (°C) water temperature (°C), salinity (ppt), dissolved oxygen (percent), tidal stage, and latitude and longitude (decimal degrees). The fish were then placed on ice in an ice chest until they were processed, but were not left on ice longer than 24-h of capture.

Fish tissues were wrapped in aluminum foil (approximately 21 cm x 29 cm) that was pre combusted at 450° C for 4-h in a muffle furnace. The foil was then packaged in sets of three because each piece of fish was wrapped in three pieces of foil. The cutting board used to collect tissue was covered with foil, washed with methanol, rinsed with de-ionized water, and allowed to air dry. The foil on the cutting board was replaced with a piece of solvent washed foil after each sample. The foil was positioned so that the dull side was toward the fish. The knives used to collect tissue samples were washed with methanol, rinsed with de-ionized water, and allowed to air dry.

FIGURE 1. Map of study area and collection sites
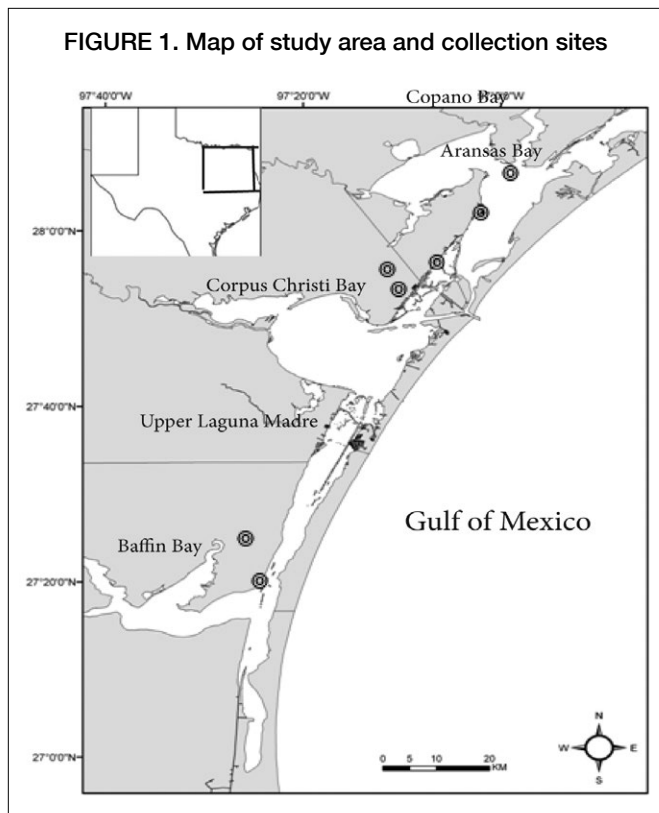
The total length (TL) of each fish was measured and recorded to the nearest mm, and the sex of the fish was also recorded. Fish were rinsed and then placed on the foil-covered cutting board. Each fish was filleted on the left-side and dorsal epaxial white muscle tissue weighing at least 20 g was removed with nitrile gloves and placed on a sheet of pre-combusted foil and wrapped. Nitrile gloves were replaced and knives were cleaned as described above after each sample. The sample was then wrapped again in a second and third sheet of foil. An identification tag was placed between the second and the third foil pieces. Each tag noted the bay system, species, and the individual sample number. The foil-wrapped sample was then placed in a whirl-pak which was also labeled with the bay system, species, and individual sample number.

Tissue samples were then stored in a -20°C freezer at the lab at Texas A&M University-Corpus Christi (TAMU-CC) until shipped to the Geochemical and Environmental and Research Group (GERG) at Texas A&M University for analysis. Tissue samples were catalogued and placed in large whirl-paks based on bay system and species. The samples will be packed in dry ice when ready to be shipped overnight to GERG.

GERG will determine the level of mercury in the samples using cold vapor atomic absorption spectrometry. Dioxin levels will be determined by isotope dilution high resolution gas chromatography/high resolution mass spectrometry. This method will identify levels of tetra through octa PCDD's and PCDF's. PCB levels will be determined using gas chromatography/mass spectrometry using the selected ion monitoring model, and this method will test for twenty-two different PCB's (Sericano, 2002, 2009; Sweet, 2008).

RESULTS

Currently a total of 39 fish have been caught in the study area. Ten fish were caught in Aransas Bay, 17 fish were caught in Corpus Christi Bay, and 12 fish were caught in the Upper Laguna Madre. The mean size and standard error were calculated for each species in each bay system (Table 1).

The mean size for spotted sea trout and black drum was slightly higher in Corpus Christi Bay. Red drum mean size was nearly the same in the Upper Laguna Madre and Corpus Christi Bay and they were both larger than the mean size of red drum caught in Aransas Bay. The number of females outnumbered males in the Upper Laguna Madre and Aransas bays; however, the sex of 9 fish was undetermined.

DISCUSSION

Currently, not all fish have been collected, nor have the samples been sent to GERG for analysis because 3 black drum need to be collected from Aransas Bay. However, there are similar studies that can provide insight as to what our results may show.

Mercury, PCB's and dioxins are all lipophilic compounds that tend to bioaccumulate (Harris and Jones, 2008; WHO, 2010; Zahir et al., 2005). In a similar study in Florida, estuaries contaminate levels were found to have a positive correlation to fish size (Adams and Onorato, 2005). This may be due to the fact that the compounds have a tendency toward bioaccumulation. The older and larger fish may eliminate these compounds at significantly slower rates increasing the accumulation of the compounds in larger fish (Adams and Onorato, 2005; Gray, 2002).

One of the reasons fishes of different sizes were collected was that the levels of contaminates may vary between different species of similar sizes. This may be due to the feeding habits of the individual species. Red drum, spotted sea trout, and black drum all feed on invertebrates, but red drum and spotted sea trout consume more vertebrates, while black drum tend to feed mainly on invertebrates (Adams and Onorato, 2005). Invertebrates have fewer lipids as compared to vertebrates and may be more efficient at eliminating contaminates. In a study conducted in Lavaca Bay, Texas, it was found that when invertebrates were in water high in contaminates, the level of contaminates in the organisms were also high, but when the organisms were moved to water with fewer contaminates the level in the organisms decreased. This may be because contaminates are absorbed from the surrounding environment rather than from diet and the invertebrates eliminate contaminates (Lewis and Chancy, 2008). Assuming that the level of contaminates in the bay systems are relatively low, it is likely that the level of contaminates in black drum will be lower than red drum and spotted sea trout of similar size (Adams and Onorato, 2005; Gray, 2002; Sager, 2002). Although there are currently no results, the sample collection is almost complete and final results will be reported soon.

TABLE 1. Samples collected by bay and species

Aransas Bay

Species	Sample Size (N)	Total Length (mean) cm	Standard Error	Males (N)	Females (N)	Unknown Sex (N)
Spotted Seatrout	5	433	20.5	0	1	4
Red Drum	4	570	18.7	2	2	0
Black Drum	1	528	0.0	0	0	1

Corpus Christi Bay

Species	Sample Size (N)	Total Length (mean) cm	Standard Error	Males (N)	Females (N)	Unknown Sex (N)
Spotted Seatrout	6	469	26.6	1	5	0
Red Drum	7	595	58.2 1	1	2	4
Black Drum	4	569	30.5 2	2	2	0

Upper Laguna Madre

Species	Sample Size (N)	Total Length (mean) cm	Standard Error	Males (N)	Females (N)	Unknown Sex (N)
Spotted Seatrout	4	459	33.6 0	0	4	0
Red Drum	4	598	22.8	0	4	0
Black Drum	4	495	7.0	1	3	0

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IMAGE THEATRE AND HUMAN TRAFFICKING

by LUCINDA RICO

ABSTRACT

In 1975 a new theoretical work called Theatre of the Oppressed, by Augusto Boal, appeared to the public. Augusto Boal created a documentary drama that focused on the current issues and used a stage, presenting the performances in public spaces for the audience. This theatre became well known in South America and became a standard for socially aware theatre. In Boal's theatre he has many dramatic forms they are Newspaper Theatre, Forum Theatre, Invisible Theatre, Image Theatre and Legislative Theatre. Boal stresses that theatre is a place where performances can inform audiences about the present social issues or even about past events. The focus of this project is to test the theory of Theatre of Oppressed: Image Theatre.

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INTRODUCTION

Theatre of the oppressed allows the audience to become part of the performance. The main purpose of Augusto Boal, who is the creator of Theatre of the Oppressed, was to study, discuss and express issues about the society and other forms of oppression by using theatrical language.

Boal allows the public to become active, so that the audience explores, and analyzes the reality in which they are living. Boal uses different kinds of methods to educate and transform the interior reality of people's minds to the social issues. His different types of dramatic forms are Newspaper Theatre, Forum Theatre, Invisible Theatre, Image Theatre and Legislative Theatre. Each of these dramatic forms has its own different techniques of expressing indivdual struggles or oppression-using either dialogues or non-dialogues with movement of the body. My main focus of Theatre of Oppressed will be on the Image Theatre style to test Boal's theory, and to investigate other resources that have tested Boal's theory of Theatre of the Oppressed.

The Focus is Image Theatre

Image Theatre is a series of techniques that allow people to communicate through body images and spaces. Image theatre allows the participants to "mold or sculpt their body" into a physical representation, experience

about how they feel in their own oppressions. Boal's idea of this dramatic form was not to use words in order to communicate to the audience, but to use specific body movements that represent the social issues.

LITERATURE REVIEW

Kerry Proctor, a family therapist, in the article "Exploring theatre of the oppressed in family therapy clinical work and supervision," states that Theatre of Oppressed methods have been used in family therapy clinical work. The techniques have been used in education, health and prison systems in a number of countries. The article also explains how clinical supervision and family therapists apply Boal's techniques in their work to help families with issues such as anger or communication.

This current research explores how the therapist uses "Breaking Through," which is a technique from Image Theatre. The article states that a therapist named Helen was using the sculpture method for family sessions. The sculpture technique involves the use of participant's bodies, objects around the room, sound and movement in symbolic sculpted shapes and forms in order to transform the feelings and behaviors of the other participants. Participants are encouraged to get into the shoes of their spouse, child or sibling as a part of the image technique. The main purpose is to have them discover their feelings and emotions and behavior experience. Helen described a couple complaining about their large family and being oppressed with each other. Helen asked her clients to sculpt themselves and develop a "scenario of each other" by using the techniques and some empty chairs to represent significant family members. While this was happening, Helen and the couple notice how overwhelmed they were. The couple was able to observe and reflect on each other's solutions. In the end the couple felt more empowered to start viewing solutions to help their family.

Another result is a sociologist arguing against Theatre of the Oppressed as to helping people. "Acting out of habits-can theatre of the oppressed promotes change? Boal's theatre methods in relation to Bourdieu's concept of 'habitus'." This article explains about everyday habits that people have and do in their daily life and explains how Theatre of the Oppressed can be used to help change habits. A French sociologist, Bourdieu, re-

searches the "habitus" (habits) of the human body, and if Theatre of the Oppressed can provide tools to help change the habitus. Bourdieu's research was to answer the questions, why change is so hard to do. Boal claims that it is possible to be able to break free from inner and other oppression. He claims that theatre can help with personal problems, but Bourdieu claims the opposite of Boal. Bourdieu explains that it is hard to achieve and overcome personal habitus, because changes only occur as a result of unusual conditions. Bourdieu states that in situations of crisis, we are able to overcome our own habitus, but it is very rare for a change to occur.

"Exploring the Stigmatized Child through Theatre of the Oppressed Techniques" is a case study done by Johnny Saldana. His project was an experience in Theatre of the Oppressed (TO) with fourth and fifth-grade children. One of Saldana goals was to explore how young students in elementary respond to Boal's sessions such as Games, Image Theatre, and Forum Theatre. Saldana's most important goal was to provide children with opportunities through TO and to explore how their personal oppressions, such as being bullied, could be recognized and solved in the classroom.

Saldana and a team of five facilitators from Arizona State University worked in an elementary school for eight-weeks in 2000 to document the children's reactions to Boals theatrical methods. As he began to interview the students and explain the process of the project and TO, one female student was pointed out by a teacher. Sarah was her name; the teacher talked to Saldana about how the students bulled her because they thought she was different and how Sarah was very self-conscious. While continuing to view the students, Saldana was selecting Boal's games and Image Theatre work for the students. He introduced basic concepts such as power and oppression and Forum Theatre, where demonstration, modeling, and example are used on the students. In the Forum Theatre, Saldana arrange two females to portray as elementary students for the school, one being the antagonist who would rudely bump into the protagonist as they walked past each other in front of the fifth grade class. Emily was asked to be the antagonist – "the savvy" – and Michelle was asked to portray the protagonist "the nice girl but reluctant to stand up for herself." The actors were informed of the idea of the session and

the goals of the project, and knew to be improvisational as the students explored the issues of shame.

First Saldana held sessions of the TO project with Sarah's class for two weeks. In the sessions Saldana would review sculpting techniques, which is asking the person for permission to touch and sculpt him or her, basically "mirroring an image for him or her to copy. When the fifth grade class, including Sarah was in the classroom, Michelle and Emily came in the class as new students. Saldana asked the class to sculpt images of Michelle and Emily and Sarah volunteered for the selection. While the class was sculpting the two new students, Michelle and Emily started to say their monologues to each other. An example would be: Michelle: I'm so nervous, it's hard to be new and not have any friends and kinda scary. Emily: I don't think I wanna be friends with her; she has "four eyes." After saying their monologues Saldana ask the class to offer Michelle and Emily a seat, Sarah speaking out of her comfort, offered the two of them. As Michelle and Emily walk to Sarah, Emily passes by Michelle and bumps into her. As soon as that helped Saldana asked everyone to "Freeze" and asks the class, "What is Michelle think or feeling?" Sarah raised her hand and asked, "Why in the world did she do that?" Michelle and Emily than started their dialogue; Emily was saying to everyone that Michelle is "new and she wears glasses, and I don't like her clothes." Saldana ask the class to explore ideas to solve Michelle's oppressive action. Sarah offered to befriend Michelle and Emily; another student suggested that Emily should bump into Michelle again. First, Sarah told Emily and the class that it was rude what she did and said to Michelle. After the conversation, Emily bumped into Michelle but Michelle responded with "excuse me," and starts a friendly conversation. Sarah gave the idea to Emily that she should drop her unkind gestures and befriend Michelle. Sarah's idea motivated Emily to be kind to Michelle. Emily than sculpted herself into a position that showed she accepted Michelle as a friend. Saldana encourage the class to stand behind Emily and say things that might persuade her to transform herself into an image of accepting Michelle. After Emily accepted Michelle, Saldana announced to the class "You did it," and explained to the class about the whole purpose of the project, which was to have the student's find their self-confidence. Sarah became an engaged student from then and her self-es-

teem changed. The goal of the project was to change the attitudes of the students by searching for solutions for an issue. ("Exploring the Stigmatized Child through Theatre of the Oppressed Techniques" Johnny Saldana. *Youth and Theatre of the Oppressed*, New York, New York. Mach 2010.)

What is my Project?

In my project I am testing to see if Augusto Boal's ideas are significant to determine if Image Theatre can transform the interior reality of people's mind into thinking and taking consideration of social issue.

In order to test Boal's Image Theatre method I created a dance movement piece entitled "Unspoken," about human trafficking and invited audience members to watch it and then fill out survey asking about…. The surveys had questions such as, 1. If the performance provoked an emotional reaction, 2.if it inspired them to share the knowledge they gained about human trafficking, 3. if prior to viewing the performance they knew that social issues could be portrayed through theatre, 4. if they believe that a performance such as "Unspoken" is an effective way to make communities aware of societal injustices and problems.

RESULTS/DISCUSSION

The data was collected on July 31st after the performance of "Unspoken" at the Center for Arts, Warren Theatre Texas A&M University-Corpus Christi. About 90 people came to the performance and 35 people answered the survey questions. The answer choices were strongly disagree, disagree, neither, agree and strongly agree.

The first question, the performance provoked an emotional reaction; 71.4% marked strongly agree for and 28.6% marked agree. Prior to the performance that the audience watch, this states that majority of the 35 people felt an emotional reaction while watching the show.

The second question, for the performance inspired me to share the knowledge I gained about human trafficking; 45.7% marked strongly agree 48.7% marked agree and 5.7% marked neither. With this test question, it shows that people agreed to share the knowledge they gained about human trafficking to other people in the community.

The third question, prior to viewing the performance, I knew that social issues could be portrayed through theatre; 31.4 % marked strongly agree, 60% marked agree and 8.6 marked neither. According to this test question, the majority of the 35 people agreed that they knew social issues could be portrayed through theatre.

The fourth question, I believe that performances such as "Unspoken" are an effective way to make communities aware of societal injustices and problems; 80% marked strongly agree, 20% marked agree. After viewing the results for this test question, this states that people believe theatre can have effective way to make communities aware of societal injustices and problems.

The results of this study show that Augusto Boal's ideas and Image Theatre technique can have an emotional effect on people and can educate the community about the social issues. Overall, according to the results of the questions, no one had disagreement with the show and theatre. The majority of the people who answered the surveys had positive answers.

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STRATEGIES OF RETIREES: HOW MATURE INDIVIDUALS SURVIVE AND THRIVE IN LATER ADULTHOOD

by BAMBI STEPHENS

INTRODUCTION

Many difficulties can arise when a person comes upon retirement age: financial problems, health concerns, acceptance of aging, and feelings of isolation. The goal of this project was to learn about financial budgeting strategies among seniors that allow them to continue living life as they had before retirement. Interviews with seniors revealed that financial budgeting was not the only hardship of survivability in retirement. Interviewees credited their survival, happiness, and making ends meet with keeping positive about aging and maintaining their spirituality.

Disengagement theory postulates that negative stigma attached to growing old and being retired makes a person feel as though they have been removed from society as a productive individual (Ritzer 2008) and now they are expected to not be a worker but rather an observer

of society (Facchini, Rampazi, 2010; Peace, 1990). This thought process could be attributed to the exclusion with which aging persons are faced as they begin the process of disengaging from one's worker routine and reengaging into another life role. While these theories may tell us what to expect for the elderly within their social encounters, they do not address the emotional difficulty that a retiree may encounter as they pass through the life course into what could be seen as the final stage in life, retirement.

LITERATURE REVIEW

The aging populace can be regarded as sacred among some and despised by others; the determinants of these beliefs are strongly tied to demographics. Cox (2010) states that within the aging population "some people believe that the best way to understand the problems of the elderly is to regard them as a minority group, faced with difficulties similar to those of other minority groups". The elderly are identified as people who have come to a time in their life where they are just waiting for life to end, or they are seen as a group of persons who have worked their entire lives and earned their right to relaxation (Meyer and Herd 2010; Schulz and Binstock 2008).

Aging is the ultimate adventure, taken on by every person in their progression throughout the life course. It

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is a requirement in life that we all must face; it is not a feature in life that we can choose to avoid. The belief that life settles into a relaxed and happy tempo when a person comes upon the age of retirement with leisure time and paid labor ending can be thought of as the typical stereotype of retirement (Heo et al 2010). Although some believe that retirement is a comforting, safe excursion from the working sector where there is no financial distress (Dailey 2000), the reality is a far cry from the truth for many individuals, especially for people who are single/widowed women and or women of color (Gazso 2005; Meyer and Herd 2010).

Recent debates bring about thoughts that the retiring want to stop working, live a life of luxury, and draw their social security checks (Shculz and Binstock 2008) Throughout the media the life of retirement is portrayed as a time of over pronounced leisure, while the economic disparity and struggle with acceptance are ignored (Heo et al 2010). The process of stopping the laborious tasks and sitting back and collecting monies from the government and also private pensions and annuities is not retirement. Presumptions that all retirees are drawing their pleasure and enjoyment in retirement directly from the government and do not have any discomfort, disparity, or setbacks with their economics, emotions, and health becomes the focus (Colvin 2010; Price 2006; Sherlund 2006; Temple 2009).

Meyer and Herd (2010) found that there is a segment of the population that feels that our social programs are too lenient and rewarding in order to make sure the Social Security program does not deplete. Retiring to the "market friendly" population suggests that we as a society should develop ways to privatize all government social programs so that "what is put in" is "what you get back" (Meyer and Herd 2010). A solution to this problem is said to be the privatizing of all social programs, so that they are not something guaranteed to us as American citizens through a socially funded program, but rather a distinguished embodiment of achievement earned through hard work; you get back what you put in (Hardy 2010).

One significant disparity existing right now is the disparity between the Social Security benefits males receive versus the Social Security benefits females receive. Men and women can work the exact same number of hours and not get the same amount back in their Social Security earnings during retirement (Cox 2010). The distinctiveness continues to grow as the population is studied further among demographics lines. Married couples and single men, who are retired, are said to be getting the most out of the Social Security programs; whereas single, widowed, and minority women are getting the least amount back (Cox 2010; Dailey 2000).

The difference in amounts that these two groups get back in funds can be such a large difference that it can be anywhere from half of what a single white male will get to a quarter of what a widow would get compared to a married white couple (Schulz and Binstock 2008). Gazso's says that it is "these experiences of occupational segregation, income disparity, and responsibility for family members among women….that are relevant to women's experiences of poverty in old age" (pg.11 2005).

Another aspect of retirement is the income disadvantage in how people survive during retirement because of the inadequacy in socioeconomic status (McCormick 1998). The continuation of poverty and the massiveness of it affects the elderly so much so that it could be one of, if not the only, circumstance that holds them financially immobile (Price 2006). The disadvantage among this larger group within the retired community that are typically struggling can be attributed to lack of education and, lack of home ownership, and also the tendency to be single (Manchester 1997).

Elderly living in poverty are more likely to be the oldest of this populace and also lack the resources to have access to additional sources of income beyond Social Security (McCormick 1998); there are no private employer pensions or the nest egg savings (Sherlund 2006). As McCormick (1998) said, the difference in retirement income in the poor is not a sense of "crises" but rather a disadvantage based on inadequacies that can be attributed to lower education levels, being a single parent, and also having assets such as home ownership (Manchester 1997).

Social Security is usually the only source of income for the poor, although Social Security is only suppose to be supplemental to monetary survival in retirement; pensions, owning a home and additional private retirement

benefits are necessary to live beyond the foundation of Social Security (Sherlund 2006). As Price (2006) states, "Low income in later life is the legacy of their individual poor financial circumstances," the only thing that does allow for the majority of the elderly poor to continue to survive during retirement is simply that "the government is rescuing" the poor retired population via financial programs and aid (Colvin 2005).

As a retired person begins to get older, the sources in the retirement process begin to increase through the ability of Social Security (Colvin 2005) yet this still does not alleviate the problems of making ends meet and sometimes leaves elderly using assets gained throughout their lifetime as a means to financial survival (Moschis and Burkhalter 2007). Retirement does have an effect on the "quality of experience" that the elderly have (Heo et al 2010).

For the ones who do not have additional sources of monetary benefits, they find ways to budget their resources to extend for all necessary accommodations and to alleviate any qualms about not making it and just getting by through their commitment to spirituality. (Black 2010; Sinnott 2009). Active spiritual faith seems to be the one thing that elderly can find that can help them reinsert themselves back into the swing of society. This active spirituality also provides a sense of still being able to play a role in society without having to rely on the role of being a worker (Moschis and Burkhalter 2007; Temple 2009). Acceptance of death, loss of work, and feelings of inadequacy and alienation because of aging are all factors that mesh together to bring about reliance on spirituality and a higher power for happiness and a sense of health and well being (Black 2010).

While research has addressed the challenges retirees face, the research is often conducted using general surveys that do not allow for researchers to learn how retirees cope with their challenges' in their own words. This project attempts to address this methodological shortcoming.

METHODOLOGY

Sample

The criterion for participation was selective. In order to be considered for participation, the person must be of sane mind with no psychologically deteriorating condi-

tions; be of fair physiological health; be above the age of 55; and also be receiving Social Security supplemental benefits. Access to this population was gained through a local senior community center in South Texas for persons over the age of 55 who are typically retired.

Overall, the sample consisted of eight participants, of which five were African American and three were Latino. Of the eight, six were female and two were male. In regards to age, five of the eight were between the ages of 60 and 80, which were referred to as the older ones among the participants; the remaining three were between the ages of 55 and 59 and were considered the younger of the older participants.

Collection of Data

Data was collected through rigorous extensive semi-structured interviews. The interview schedule consisted of a set of 32 questions. These questions were broken down into the following categories: demographics, family support structures, expenses, and personal experiences. The interviews were face to face, lasting on average 31 minutes. During the interviews all participants were read the consent form and were told that if at any time they were not comfortable, the interview could be stopped at any time. The interviewees were offered incentives for their participation. Interviews were recorded using a Sony digital MP3 recorder along with a microphone extension. Once interviews were complete, they were all transcribed using Windows media player and Microsoft Office 2007.

Interpreting Data

Once the data that was collected was transcribed, the data was analyzed through four stages of coding. In the first stage, the data was examined on an individual level for relevant information to produce themes. In the second phase of coding, the individual themes from stage one were compared to the other interviews, both separately and as a whole, and similar repetitive attitudinal variables were noted; the end result to this stage was another, more refined grouping of themes. During the third stage of coding, the overall compilation of themes and related the meanings behind those themes to the bigger picture of aging, retirement, and individual / collective social forces. Finally in the fourth phase of coding, the thematic big picture of the data itself was taken and related back to the previous research. The inter-

pretation of the data was constructed under the coding process Esterberg uses in Qualitative Methods in Social Research (pg. 157-162 2002).

FINDINGS

Given the prominence of financial struggles in retirement literature, the interview schedule focused on budget-related issues. Upon review of the transcripts it is apparent that financial struggles are a routine part of living on a fixed income, and strategies that interviewees discussed as integral to survival did not pertain to budgeting practices. Rather, strategies necessary for survival often took the form of engagement with spirituality and positive thinking. As Sinnott says "It seems evident that spiritual systems deal with….re-construction of the self in the face of aging and dying…These practices help ease the transformation of self" in the face of death (pg. 4 2009).

Medical Concerns

It was found that for all of the participants involved, getting to the doctor, paying for prescriptions, paying bills, and surviving according to the daily norms of living in society were pretty much all met and not really a worry. All of the participants never had an issue of paying for any doctor visits or medications. All of the participants cited having access to a public program that assisted them in getting to the doctor. As long as appointments were made for the ride they got to the doctor. The only way that the doctor visits would not happen is if they did not call the doctor.

What was found, however, was that financial budgeting was not the unified point of getting by in retirement but instead accumulation of spirituality along with positivity toward making what you have in life meet your financial needs became the unity of survival and happiness. Not only was it uncovered how the finances were factored into everyday living but it was also discovered how the budgeting of thoughts, self-esteem, and acceptance all contributed to where a person is in the cycle of the life course.

The older ones (60 to 80 years of age) cited happiness, surviving and budgeting resources, along with being humble, gracious, accepting, in touch with their higher power and also participating in exercise. It was recognized that happiness is something that was more preva-

lent among the older ones within the population than it is with the younger of the older (55 to 59 years of age) populace. What was found was that the older that you are, the more happy, healthy, calm you become with the acceptance of your place in the later of the life course, and that it does eventually end.

Societal characterization is a heavy influence that all ages endure. Characterization places you into the categories of labels that will define you, at least biologically. The elderly are labeled as being overly needy, incapable of performing daily tasks, unable to comprehend, and also having the inability to have a meaningful conversation. The majority of my participants enjoyed many social activities that ranged from playing billiards, to playing dominos and bingo, and even playing chair volleyball.

The older participants of the group were more willing to make phone calls and stay on top of not only their rides to doctor appointments, but also refilling their meds, paying their bills, and reapplying to other social assistance programs, and they made no complaints about the process of having these programs work for them and not against them. The younger ones of the group had issues with keeping appointments, finding a ride to the doctor and also getting their meds as needed.

These younger participants were also granted the exact same access that the older group had, but seemed to not want to work with the system. There was an air of having grudges and feelings that the system and or programs were not there to help but rather to exploit them and make them appear to be needy or destitute.

The younger participants looked at the help from social programs to be hindrances on their ability to maintain their identity as working individuals. Instead of understanding that this was part of their growth within the process of life, they saw it as a road block, placed there as a punishment because they were growing older.

Monetary Concerns

The bills were approximately the same for all persons except a few of the younger ones who had rent and utility bills that were greatly lower than most of the older ones. Overall all income was 800 to 1200 dollars a month (from Social Security); all received food stamps; and all had health insurance with minimum to no co pay. With the group, the men and the women involved

also had very similar Social Security earnings, except for the younger ones, who seemed to have a little less income per month than the older ones. The difference in amount was not significant, but averaged about 20 to 50 dollars less a month.

None of the participants ever had their utilities, electricity, or water turned off since retiring. None of them cited any problems paying the rent. There was one instance when one participant had a main water pipe break underneath the house, but the water company made arrangements with them to pay it out over several months, so that their water did not get turned off.

Outlook on Life

It was noticed that the older the person was the more accepting they were with self identification and their placement within the course of life. It became apparent over the course of analyzing the data that older people were having an easier time accepting the process of aging. The younger participants of the group that were interviewed had more of a negative outlook on life and therefore happiness was not something that they enjoyed pursuing but rather a commodity that they were entitled to because of age.

The younger group of participants saw happiness as being able to live beyond your means, live that American Dream of retirement, and never have a care in the world. The younger participants' of the group complained of various mental and physical ailments at the time of interview than did the oldest of the group. They were angry, frustrated with their money situations and made it clear that they do not get enough money to survive month to month - although when compared to the older group, they made on average the same amount per month in Social Security.

The older ones were willing to sacrifice more of their income on housing costs to be in a safe, secure, and quiet neighborhood. They preferred to be living among other retirees within a retirement community; reasons cited were the quiet atmosphere and the limitations of specific ages within that community. I cannot account for the disparity in Social Security paid out to women, men, and or minorities; because the group of participating individuals was all persons considered to be a minority.

Becoming older may be an inevitable biological process, but it is definitely a process that many people do not socially or emotionally prepare themselves for. Out of all of my participants, not one single person had planned or even thought about retirement and aging until they were face to face with the issue. There were no preparations made in earlier adulthood to counter act the surprise expenses that accompany getting older. The only thing that may be considered planning ahead was the fact that one participant had lived in the same home for 37 years and had their home paid off; therefore making it easier for them to pay for all other needs.

CONCLUSION

In ending the interviews, it began to surface that the meaning of the questions asked were not interpreted the same, especially within the mature retired population. The purpose of this project was to find what financial rituals were employed by the elderly to survive and thrive on a fixed income. The initial question of surviving and budgeting financially was not answered with exact certainty but rather the survivability was explained through the attuned acceptance of life in the present.

Accepting different stages of the life cycle can be rather difficult for any person, but none as much as the phase of aging into the later part of life. The younger of the participants struggled with transition not because of free will but because of necessity in the life course. This large part of our population is faced with an indefinite ending. What was found was that this inevitable progression through life can be lived in a state of acceptance and pleasure or anger and pain; the one you choose will solely weigh on your well being, biologically, emotionally, and spiritually. Interviewees credited a higher power to their survivability during times of poor health and also during times of financial difficulty.

The people who were able to pay their bills and get by were not getting by because they had an awesome trek of retirement funds, but rather because they had an overabundance of health, happiness, and emotional rightness because of spiritual health. "Depth of poverty and persistence of poverty are particular problems for pensioners" (Price 2006), one way of giving back is through spiritual rightness involved with "doing good works of giving what you have to others" (Sinnott pg.

4 2009). Spirituality is the elixir and the definitive approach to getting older, surviving, and being happy.

DIRECTIONS FOR FUTURE RESEARCH

The limitations in doing this research were those of time and available participants. Ample participants were found but due to time constraints and the inability to accommodate all of their wanting to be interviewed only a fragment of the willing were interviewed. I would like to be able to continue this research to expand the numbers of participants. I would like to go further within the research to see if the older you get, the happier you are and if this is true, if it would be because of a spiritual force or belief held onto for comfort and stability.

There needs to be an expansion on the literature in reference to retiring and survivability. One direction that may help produce more viable information on this subject in gerontology is to explore a more qualitative approach with a large number of participants so that there can be an understanding on a personal level, instead of reliance on surveyed data that does not encompass personal experiences.

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COMPARISON OF LINEAR AND BRANCHED AMINO ACID BASED SURFACTANTS AS PSEUDOSTATIONARY PHASES FOR THE ENTANTIOMERIC SEPARATION OF CHIRAL COMPOUNDS WITH CAPILLARY ELECTROPHORESIS

by JOSE TORRES

ABSTRACT

This research is part of a large ongoing research study involving the synthesis, characterization and comparison of "linear" and "branched" amino acid based surfactants for entantiomeric separations of chiral compounds, a type of compound that lacks an internal plane of symmetry and has a non-superimposable mirror image of itself. An enantiomer is one of two stereoisomers that are similar but not identical to each other. A common entantiomer that became famous in the late 1950s was Thalidomide, a pharmaceutical compound having two similar entantiomeric sides, one side proven to cause birth defects and the other to subdue the symptoms of morning sickness. The purpose of this research is to attempt to separate chiral compound entantiomers from each other. Physical properties to be characterized included the critical micelle concentration, aggregation number, and optical rotation of each surfactant. Nuclear Magnetic Resonance (NMR) and High Performance Liquid Chromatography (HPLC) were used to determine purity of products. Other spectroscopic techniques were used to characterize the properties of the micellar core of these surfactants. We have been successful in synthesizing, char-

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acterizing and purifying the Amino Acid Based Surfactant chain Undecylglutamic acid, and from this surfactant chain we have added OMe and (OMe)-OH. In the future, other procedures will be followed to connect main group amino acids such as Leucine, Alanine, Glycine and Valine. Finally, Capillary Electrophoresis will be used to determine the chiral selectivity of these surfactants.

INTRODUCTION

Surfactants are organic molecules that contain two distinct components, differing in their affinity for solutes. The part of the molecule that has an affinity for polar solutes, such as water, is said to be hydrophilic; the part of the molecule that as an affinity for non-polar solutes, such as hydrocarbons, is said to be hydrophobic. Aggregation of surfactant molecules forms micelles that assemble through physical association above a certain surfactant concentration known as the critical micelle concentration. In previous studies enantiomeric resolution comparisons for different chiral analytes have been examined using chiral amino-acid based surfactants. Enantiomeric separations of pharmaceutical products have been done with the use of these chiral amino acid based surfactants used as pseudostationary phases (PCS) in capillary electrophoresis. However, there is a need to find a PCS that can separate a variety of enantiomers. Occurring when different analytes form complexes with PCS, the structure of PCS plays a vital role in chiral recognition. The goal of this research is to separate chiral compound enantiomers from each other. In order to achieve this goal, we have synthesized Und-Glu-OMe and Und-Glu-(OMe)-OH surfactants. In the future we will attach more amino acids to the carboxylate groups of these surfactants to product di, tri and poly peptide surfactants and utilize them as PCS for chiral separations of pharmaceutical products.

BACKGROUND

Chiral compounds are compounds that lack an internal plane of symmetry and have non-super imposable mirror images of themselves. A compound is deemed chiral if it has an asymmetric carbon atom; this is a carbon atom that is attached to four different groups of atoms. If a chiral compound has two non-super imposable images of itself it has two optical isomers, which are species with the same number and types of atoms

as another chemical species, but possessing different properties. These optical isomers are enantiomers of the chiral compound. Of these enantiomeric sides one can be a harmful side and the other a beneficially helpful side, depending on the compound in question. Separations of these harmful enantiomers are currently under study with the help of amino acid based surfactants.

Amino acids have been used as materials for the making of surfactants and were discovered recently in the last century. They are used as preservatives for pharmaceutical and cosmetic applications and are active against different disease causing bacteria and viruses. These molecules contain both amine and carboxylic functional groups that are used in both chemistry and biochemistry research (Billiot, Warner 1743). Aliphatic compounds are carbon atoms joined together in straight chains, branched chains, or non-aromatic rings. These aliphatic compounds can be joined by single, double or triple bonds. These compounds are then combined with amino acids to make three main structures of amino acid based surfactants known as single chain, dimeric and glycerolipid like structures (Billiot et al.1252). Linear structures have an amino acid bearing at least one hydrophobic tail, the Gemini or dimeric are structures with two polar heads and two hydrophobic tails per molecule, and lastly the Glycerolipid like structure can be compared to analogues of monodiglycerides and phospholipids (Billiot et al.1253). Linear amino acid based surfactants are a-amino acids linked to long aliphatic chains through a-amino, a-COOH or side chain groups(F. Billiot, E. Billiot, Warner 332). The carboxyl group of the amino acid can be condensed with alkyl amines or aliphatic alcohols to produce N-alkyl amides and esters.

Molecules can form aggregates in which the hydrophobic portions are oriented within the cluster and the hydrophilic portions are exposed to the solvent. Such aggregates are called micelles (Figure 1). The proportion of molecules present at the surface or as micelles in the bulk of the liquid depends on the concentration of the amphiphile. At low concentrations surfactants will favor arrangement on the surface, but as the surface becomes crowded with surfactants more molecules will arrange into this micellular structure. At some concentration the surface becomes completely loaded with

Figure 1. Micelle
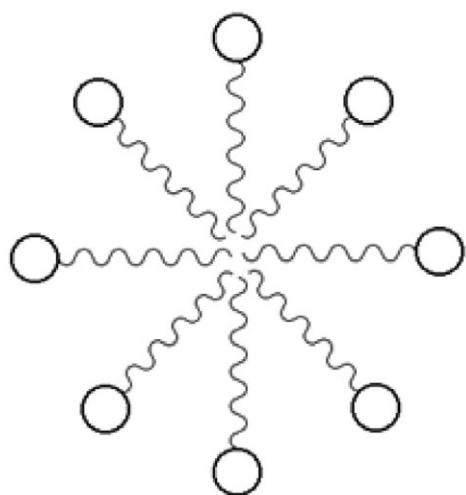
Schematic of micelle structure in aqueous solution

surfactants and any further additions must arrange as micelles. This concentration is called the Critical Micelle Concentration (CMC)(F. Billiot et al. 66). Its Measurement of surface tension may be used to find CMC. Micelle aggregate phases depend on hydrophobicity, temperature, composition and electrolyte content within the compound (F. Billiot et al. 66).

METHOD: SYNTHESIS PROCEDURES

The basic steps for the Comparison of Linear and Branched Amino Acid Based Surfactants as Pseudostationary Phases for the Entantiomeric Separation of Chiral Compounds with Capillary Electrophoresis are as follows:

1) Synthesis, purification, and characterization of N-hydroxysuccinimide (NHS) ester of undecylenic acid

2) Synthesis, purification, and characterization of the Undecyl Glutamic Acid from the NHS ester of undecylenic acid

3) Synthesis, purification, and characterization of NHS ester of Undecyl Glutamic Acid

4) Synthesis, purification, and characterization of Und-Glu-OMe &Und-Glu-(OMe)-OH

5) Cleaning and "washing" of both products for the reduction of certain unwanted peaks in HPLC spectrum

a. Use smaller amount of DI-water
b. Dissolve sodium bicarbonate in DI-water, same amount of it to its respective reaction
c. Place product in dissolve
d. Filter through paper filter
e Filter through .5μm then.2μm then .1μm filter papers
f. Allow to chill down
g. Add 12M HCl to drop pH to 0
h. Wait for precipitate to form
i. Use paper filtration and obtain product as filter cake

6) Synthesis, purification, and characterization of Und-Glu-OMe-NHS &Und-Glu-(OMe)-OH-NHS. (NHS) works as an activation group for the carboxylic group of the structure as well as a good leaving group.

7) Attachment of more amino acid groups to create a larger structure that can be studied

8) Determination of the critical micelle concentration of the product

9) Characterizatin of other physical properties of the product such as optical rotation, aggregation number, etc.

10) Examination of the chiral selectivity of the product using capillary electrophoresis

RESULTS

We have been able to synthesize, characterize, and purify Undecyl Glutamic (OMe)-OH and Undecyl Glutamic OMe. Figure 2a shows the HNMR spectrum of Und-Glu(OMe)-OH. The signal close to 5.3 ppm indicates the vinylic proton of the hydrophobic tail. Comparing the integration of this signal with the signal at 4.4 ppm, which belongs to the chiral hydrogen of the structure, serves as an indicator of the purity of the product. Figure 2b shows the HPLC spectrum of a clean product without any unnecessary peaks. The signal at 3ppm is an indication of the OMe-OH addition. Figure 3 shows the HPLC spectrum of Und-Glu(OMe)-OH and its purity. The HNMR spectrum of Und-Glu-OMe is still in process. In order to gain the maximum purity for the product "washing" was conducted, as indicated above, multiple times.
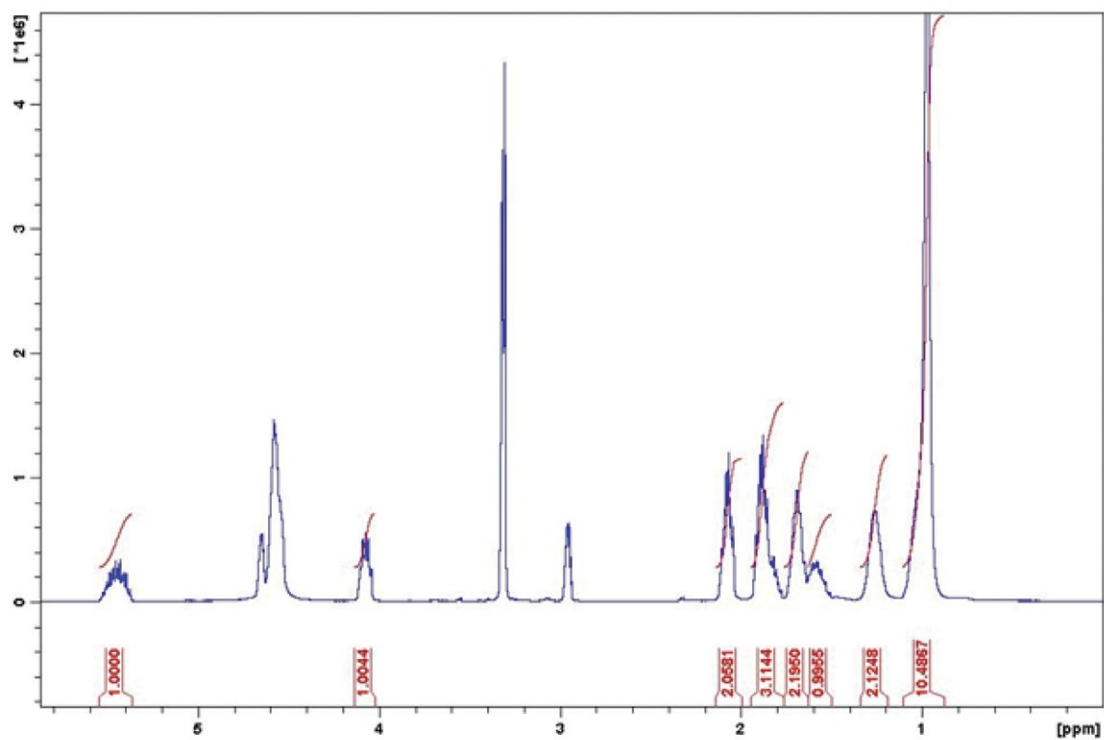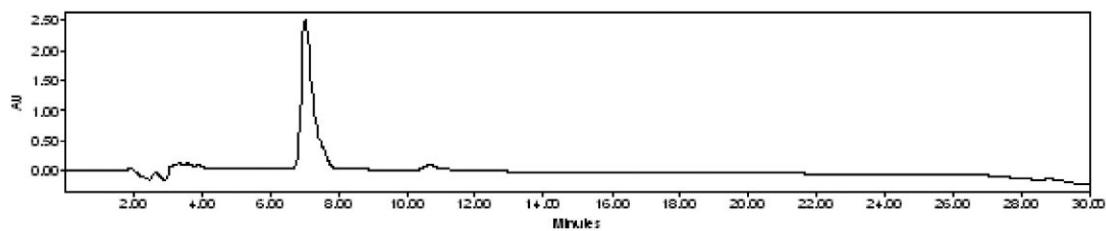
FIGURE 2.ª HNMR spectrum Und-Glu(OMe)-OH

FIGURE 2.b HPLC spectrum Und-Glu(OMe)-OH

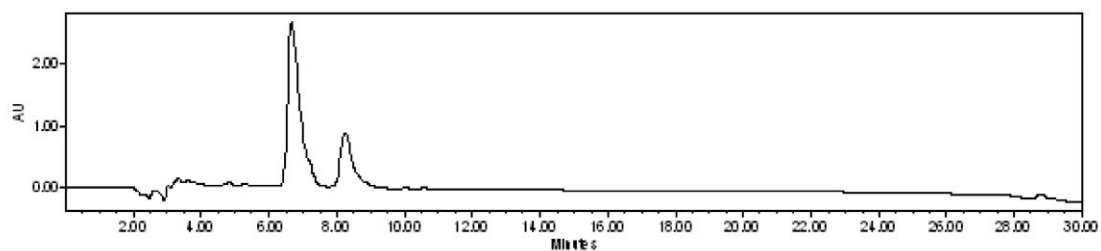### Figure 3 HPLC spectrum Und-Glu-OMe

Figure 3 will only show representation of the HPLC spectrum of Und-Glu-OMe and its purity.

DISCUSSION

The next step of synthesis requires attaching N-hydroxysuccinimide (NHS) to both Und-Glu-OMe & Und-Glu-(OMe)-OH. Following this step is the introduction of amino acids such as Leucine, Alanine, Valine and Glutamine to these hydrophobic aliphatic chains. Reaction times were difficult to predict due to certain laboratory conditions, as well as reagent and supply shipment times. It is important that we produce pure clean products because that will allow us to find chiral selectors that can be used for the enantiomeric separation of the chiral compounds for the capillary electrophoresis. We will then go on to further our research goals by creating di and tripeptide amino acid based surfactants using the same methods of synthesis, purification, and characterization.

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EFFECTS OF IONIZED PLASMA ON THP-1 ACUTE MONOCYTIC LEUKEMIA CELLS

by AMANDA WHITMILL

ABSTRACT

Although chemotherapy is an effective measure used in the treatment of cancer, various cancers can effectively block the efficacy of chemotherapeutic drugs. Additional methods must be developed to inactivate these cells in cancer patients. Apoptosis, rather than necrosis, is the desired mechanism for killing cancerous cells because apoptosis results in cellular death without initiating inflammation or destruction of tissues. It has been shown in previous studies that non-thermal plasma can effectively initiate apoptosis in melanoma skin cancer cells. This study examined the effect of non-thermal plasma on leukemia cells. Acute monocytic leukemia cells (THP-1 cells) were exposed to ionized atmospheric pressure non-thermal plasma. We hypothesized that the exposure would activate a process that leads to programmed cell death/ apoptosis. To assess death caused by plasma exposure, cells were subjected to trypan blue exclu-sion assay, and a kill-curve and assessment of death over time were compiled using data from the assay. In addition to this, DNA was harvested from treated samples to determine if apoptotic ladders were present. Results have indicated that non-thermal plasma can cause cell death in THP-1 cells over time, and the death that occurs corresponds directly to the amount of time that the cells were exposed to plasma. Ideally the results obtained from this experiment will be applied to melanoma cell lines and will lead to an inexpensive method for treating cancer and cancerous lesions.

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INTRODUCTION

Ionized atmospheric pressure plasma has a wide array of biological uses including wound sterilization, blood coagulation, treatment of cosmetic diseases, regeneration of destructed tissues, and selective programmed killing of cancer cells (apoptosis) among other applications[1]. In addition to these uses, plasma has also been used to rapidly kill bacterial cells without the need for excessive heat or harsh chemicals[2]. Ionized plasma can be generated in two forms: thermal and non-thermal. Non-thermal (cold) plasma is ideal for use on heat sensitive or vulnerable objects such as organic materials, foams, liquids, and living biological tissue[3]. This fact is what makes non-thermal plasma a potentially effective agent against cancer cells.

Plasma is made up of charged particles, free radicals, stable conversion products, excited atoms and molecules, and energetic photons[3]. All of these components are effective in killing bacterial cells, but because eukaryotic cells naturally produce their own reactive oxidative species and endure certain amounts of UV radiation, they have a degree of tolerance that allows for use of plasma to cause decreased adhesion and selectively destroy cancerous cells in as little as 10 seconds, without imparting any damage on healthy cells[3,4,5]. Studies have been conducted to determine if programmed cell death induced by plasma can destroy melanoma cells, and it has been shown that high doses of plasma can kill cells immediately and low doses can promote apoptotic behavior[6]. The cell death that occurs is not caused by poisoning of the media that the cells are contained in or other interactions, but rather through direct interaction between plasma and the cancer cells[1,6].

In this experiment the research objective was to discover the conditions of ionized plasma treatment that are necessary to induce onset of apoptosis in THP-1 cells, which are derived from a patient with acute monocytic leukemia. Much more work needs to be done in ascertaining the biochemical pathways that are being activated or possibly suppressed to lead to cellular death from ionized plasma treatment. The non-thermal plasma used in this experiment uses air and converts it to several compounds, but one of its major constituents is NO (nitrous oxide). NO plays roles in regulation of vascular tonus and blood coagulation, cell immunity and apoptosis, and neuron communications and memory, as well as antibacterial and anti-tumor protection, among other things[1].

METHODOLOGY

Preparation and Treatment

THP-1 cells were grown in 25-cm^2 vented flasks, typically for 4-5 days or until $\approx 1.5 \times 10^6$ cells per mL were present. The cells were grown in RPMI 1640 media, with 10% fetal bovine serum, 1% penicillin streptomycin, and 1% antibiotic antimycotic at 37° C/ 5% CO_2.

For treatment, a 4 mL sample of cells was transferred to a 25-cm2 flask (the depth of media was no more than 3 mm); the plasma needle was inserted so that the tip was ≈ 1 cm from the surface of the media and treatment was

started. The time parameters for this experiment were 0 (control), 5, 15, 30, 45, and 60 seconds. After exposure cells were centrifuged down and the supernatant media was decanted so that the cells could be resuspended in fresh RPMI 1640 media. Upon resuspension 2 mL of each sample were transferred to a well plate. 0, 24, and 48 hours post plasma exposure cellular death and viability were quantified by performing a trypan blue exclusion assay.

Trypan Blue Exclusion Assay

The trypan blue exclusion assay was used to quantify cell death or viability after plasma exposure. Live cells had an intact cell membrane and could therefore exclude the dye, while dead cells had a membrane that had been compromised in some way and therefore could take up the stain thus appearing blue. A 1:1 ratio of stain to cells was used and the cells were counted on a hemocytometer. By making use of data obtained from trypan blue exclusion assays, THP-1 cell death over time was ascertained.

DNA Harvest

THP-1 cells were grown in 25-cm^2 and/or 75-cm^2 vented flasks, typically for 4-5 days or until $\approx 6.0 \times 10^6$ cells per mL were present. The cells were grown in RPMI 1640 media, with 10% fetal bovine serum, 1% penicillin streptomycin, and 1% antibiotic antimycotic at 37° C/ 5% CO_2.

For treatment, a 6 mL sample of cells was transferred to a 25-cm^2 flask (the depth of media being no more than ≈ 3 mm); the plasma needle was inserted so that the tip was ≈ 1 cm from the surface of the media and treatment was started. The time parameters for this experiment were 0 (control), 15, 30, and 45 seconds. After exposure, cells were centrifuged down and the supernatant media was decanted so that the cells could be resuspended in fresh RPMI 1640 media. 24 and 48 hours post plasma exposure DNA from each sample was harvested using the Quiagen DNeasy® Blood and Tissue Kit and the obtained DNA was run on a 1.4% agarose gel and analyzed for a 250 bp apoptotic ladder or a necrotic smear.

RESULTS

FIGURE 1. Cell Death Over Time

(A) THP-1 Cell Death Over Time
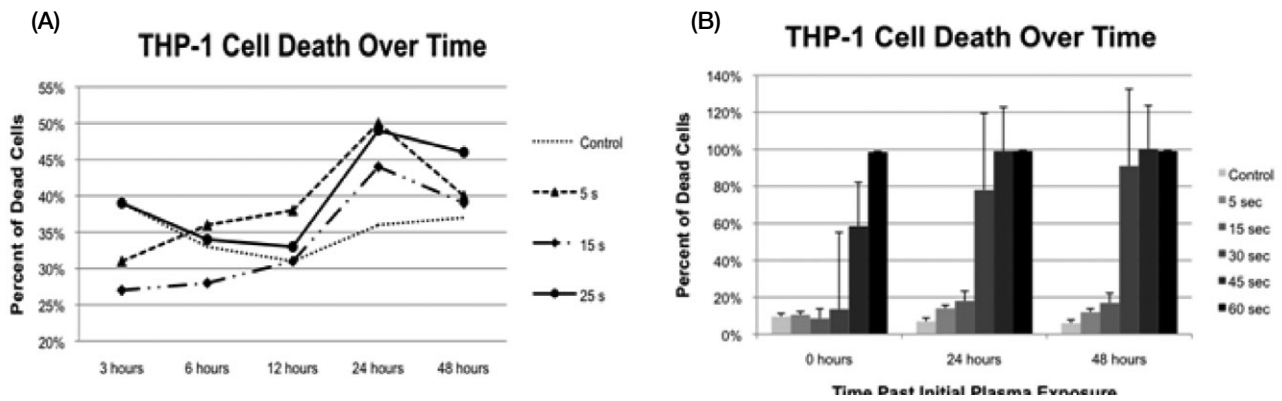
(B) THP-1 Cell Death Over Time

FIGURE 2: Trypan Blue Exclusion Assay: Images of THP-1 cells stained with trypan blue 48 hours after initial plasma exposure. Increased plasma exposure increases cellular death.
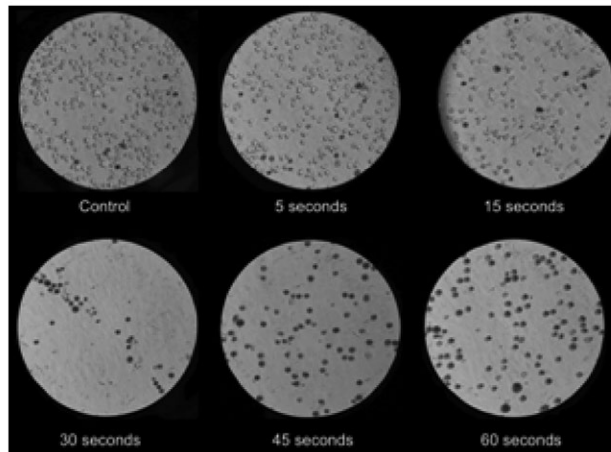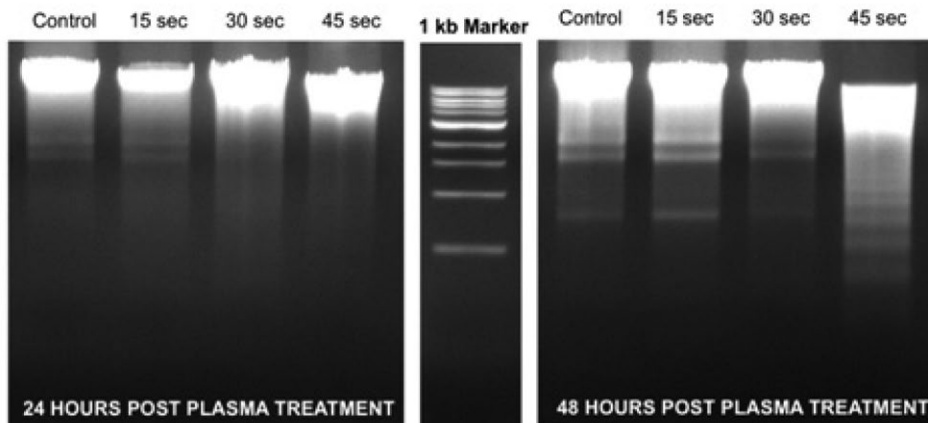

FIGURE 3: DNA Isolation: 1.4% agarose gel electrophoresis of DNA harvested from THP-1 cells 24 and 48 hours after plasma exposure.

DISCUSSION

The ionized plasma employed in this experiment induced death in THP-1 cells not only initially, especially at higher exposures, but also over time. The kill curve and assessment of death over time (Figures 1A and 1B) show this specifically. Figure A suggests that cellular death increased between 12 and 24 hours and peaked at 24 hours and then declined as surviving cells continued to proliferate. This is interesting because it could possibly be indicative of apoptosis, since cellular death was not immediate, but of course more experiments need to be conducted in order to confirm this as a prospect. The experiment represented in Figure A must be repeated and extended to longer plasma exposures, but could also be extended over time, perhaps up to 72 hours post treatment, to analyze how sufficiently surviving cells would be able to revive the cellular population. Figure B shows how higher plasma exposures (45 and 60 seconds) caused more immediate cellular death, indicating that these treatments were more likely to induce necrotic behavior particularly in the 60 second sample. Interestingly, though, the 30 second sample did not initiate significant cellular death immediately but more so at the 24 hour marker, which could also be a possible indication of apoptosis.

Figure 2 serves as a reiteration of the aforementioned conclusions. It is important to look at cellular staining and morphology because this provides some hints as to what types of processes the cells may be going through. Relatively speaking, the control, 5, and 15 second samples had a great deal in common as far as staining and overall cellular morphology is concerned. That is, most of the cells in these samples remained unstained and did not seem to be affected by the plasma, since there was no more cellular death here than in the control. In the 30, 45, and 60 second samples the majority of the cells were stained blue indicating cellular death. Morphologically some cells in the 60 second samples appeared to be larger, possibly indicating signs of necrosis. Because these photographs were taken 48 hours post plasma exposure, it was expected that there would be a degree of recovery present, but that was not necessarily the case since nearly no unstained cells were seen.

The results obtained from the DNA harvest (Figure 3) indicate that apoptosis was present in the 45 second/ 48 hour sample because of the presence of an apoptotic ladder. This was promising because the 45 second treatment was one of the higher exposures and apoptosis was successfully detected; although necrosis could not be ruled out as a possibility. More accurate testing needs to be conducted not only to confirm this but also to possibly detect apoptosis in the other samples. Further testing also needs to be conducted to see if necrosis can be detected conclusively in any of the samples.

Much more needs to be done in ascertaining the mechanisms behind the effectiveness of using ionized plasma on eukaryotic cells and biological tissues. Deciphering long term effects of plasma on the surrounding tissue and on the host that is being exposed is crucial if plasma treatment is to be employed successfully. Hopefully in the future non-thermal plasma will be used to treat individuals with melanoma and other forms of skin cancer in a quick and inexpensive way.

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TEXAS A&M UNIVERSITY-CORPUS CHRISTI
A BRIEF HISTORY

Texas A&M University – Corpus Christi began in 1947 as the University of Corpus Christi (UCC) which was affiliated with the Baptist General Convention of Texas. In 1970, Hurricane Celia causes more than $1,000,000 dollars in damage to the campus. In 1971, the Baptist General Convention of Texas sold UCC to the state of Texas and the Texas Legislature authorizes the Texas A&I University System to establish a state-supported upper-level institution of higher education in Corpus Christi. In 1973, Texas A&I University at Corpus Christi opens its doors on 4 September 1973 to 969 students as an upper-level institution of higher education. In 1977, the Texas Legislature changes the name of the University to Corpus Christi State University. In 1989, Corpus Christi State University joins the Texas A&M University System. In 1993, the Texas A&M University System Board of Regents renames the institution Texas A&M University – Corpus Christi and a year later it becomes a four-year comprehensive university and enrollment increases to 5,000 students. In 2004, the Board of Regents approves the College of Nursing and Health Sciences which opened in 2005. In 2005, Dr. Flavius Killebrew becomes President/CEO and initiates Momentum 2015, a ten year plan to establish Texas A&M University – Corpus Christi as the flagship university of South Texas. Today the University has over 10,000 students.

Today Texas A&M University – Corpus Christi is not only a proud member of the Texas A&M University System but it is also the premier public university in the region and is currently the only university in the United States to be situated on an island. Texas A&M University – Corpus Christi is currently a member of the Southland Conference under the NCAA division I.

All information on this page can be found at http://www.tamucc.edu.

To the Island & Beyond

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