

McNAIR SCHOLARS

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TEXAS A&M UNIVERSITY
CORPUS CHRISTI

TRiO
RONALD E. McNAIR
POST-BACCALAUREATE
ACHIEVEMENT PROGRAM

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

TABLE OF CONTENTS

Biography of Dr. Ronald E. McNair 1

Statements

 Dr. Chris Markwood 4

 Dr. Gerardo “Gerry” Moreno 5

McNair Scholars Program Staff

 Dr. Patricia Spaniol-Mathews, Program Director 6

 Ms. Margarita Cooper, Senior Secretary 6

 Ms. Anabel Hernandez, Program Coordinator II 6

 Mr. Bilal Siddiqui, Graduate Assistant 6

Journal Editors

 Mr. Ethan ???, Senior Editor 7

 Ms. Margarita Cooper 7

 Ms. Anabel Hernandez 7

 Dr. Patricia Spaniol-Mathews 7

2014 McNAIR RESEARCH ARTICLES

Taking One for the Team: Malleable Beliefs as a Predictor of Willingness to Sacrifice 10
 DANIELLE AGUILAR
 MENTOR: DR. ???

Project Read 3: The Effects of a Family Literacy Project on the Early Reading Skills
 of Three-and Four-Year Olds 16
 MARLENA GARCIA BUSH
 MENTOR: DR. CORINNE VALADEZ

The Effect of Negative Information on the Justification of Chosen Alternatives 26
 AMIE MacKAY
 MENTOR: DR. ???

Design and Development of Carangiform Pipe Inspection Device	32
CASSANDRA MANZATO	
DR. LEA-DER CHEN	
Do Parents Pick More Than A Name? First Name Phonemes and Personality Traits	37
CORREY D. MILLER	
MENTOR: DR. AMY HOULIHAN	
John Embree's Transpacific Career: Social Science, Suye Mura, and the War Relocation Authority, 1936-1946	43
ARTHUR OADEN	
MENTOR: DR. MICHAEL JIN	
Group Member Selection and Interpersonal Attraction Based on Life Status	52
CORTNEY PARKHURST	
MENTOR: DR. ???	
Individualistic Priming on Donation Choices	59
MEGAN E. PERKINS & MIGUEL A. MORENO	
MENTOR: DR. ???	
The Relationship between Visual Skills and Batting Performance of Professional Baseball Players	69
ABBY QUIÑONEZ	
MENTOR: DR. FRANK SPANIOL	
Design and Development of a Semi-autonomous Fixed-Wing Aircraft with Real-time Video Feed	74
CODY TORNO AND LUIS RODOLFO GARCÍA CARRILLO	
MENTOR: DR. ???	
Recognizing Hidden and Imperiled Coral Reef Fish Biodiversity in the Coral Triangle	84
SAMANTHA VALDEZ, LUKE TORNABENE, MARK ERDMANN, FRANK PEZOLD	
MENTOR: DR. ???	
The Representation of Latinas in America's Most Watched Shows	89
AMARISSA VERA	
MENTOR: DR. ISABEL ARAIZA	

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A handwritten signature in cursive script, appearing to read "Chris", written in black ink on a light-colored background.

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2014
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TAKING ONE FOR THE TEAM: MALLEABLE BELIEFS AS A PREDICTOR OF WILLINGNESS TO SACRIFICE

by DANIELLE AGUILAR



ABSTRACT

Willingness to sacrifice has been shown to be a component of healthy romantic relationships (Mattingly & Clark, 2010). Additional research on intimate relationships suggests that individuals who have malleable beliefs about relationships are more likely to adapt and grow with their partner (Knee, Patrick, & Lonsbary, 2003). It was reasoned that relationship partners who hold more malleable beliefs put more effort into their relationships and should be more willing to make sacrifices for their partner than those holding more fixed beliefs. To investigate this, 201 students (63 males, 138 females) completed a survey that assessed their willingness to sacrifice in a relationship, couple identity, relationship satisfaction, empathy, and malleable/destiny beliefs about relationships. Consistent with expectations, willingness to sacrifice was found to be positively related to satisfaction,

couple identity, empathy, and malleable beliefs. Fixed beliefs did not predict willingness to sacrifice, satisfaction, couple identity, or empathy.

INTRODUCTION

People differ in what they consider creates a successful relationship, and it is unclear how people's beliefs about relationships may be related to other aspects of their personality. Previous research on intimate relationships suggests that individuals who have malleable beliefs about relationships are more likely to adapt and grow with their partner. However, data suggests that individuals with destiny (fixed) beliefs are less likely to cope with changes throughout the relationship and have a tendency to have a very fixed belief as to what they expect from a partner (Knee, Patrick, & Lonsbary, 2003). One study found that people identify sacrifice as part of their conception of a loving relationship (Noller, 1996). Willingness to sacrifice has been said to occur when individuals are committed to their relationship (Agnew, Van Lange, Rusbult, & Langston, 1998) and is also positively associated with relationship satisfaction (Van Lange, Rusbult, Drigotas, Arriaga, Witcher, & Cox, 1997). With these findings, the present study explores what aspects of an individual's personality can affect their specific relational beliefs.

MENTOR

Dr. ??

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Implicit Theories of Relationships

Implicit belief theories (Knee, Patrick, & Lonsbary, 2003) imply that there are two theoretical frameworks when it comes to relationships. Individuals possess malleable or fixed belief systems that they inherently bring to their interpersonal encounters. It has been established that people's implicit theories regarding the nature of relationships involve malleability, such as growth and change, or destiny characteristics, such that people are either destined for one another or they are not (Cobb, DeWall, Lambert, & Finchman, 2013; Burnett, O'Boyle, Vanepps, Pollack, & Finkel, 2012; Finkel, Burnette, & Scissors, 2007; Franiuk, Pomerantz, & Cohen, 2004; Knee, 1998; Knee, & Canevello, 2006; Knee, Nanayakkara, Vietor, Neighbors, & Patrick, 2001; Knee, Patrick, & Lonsbary, 2003; Knee, Patrick, Vietor, & Neighbors, 2004). These relationship beliefs have the potential to guide individuals in their relationships by impacting attributions, motivations, goals, and behavior (Cobb, et al., 2013; Knee, et al., 2003; Knee 1998).

Willingness to Sacrifice

Willingness to sacrifice is exhibiting altruistic and positive forms of social behaviors towards your partner. One researcher found that the more closely a person is connected to someone, the more likely that person is to sacrifice something in an effort to help the other (Bar-Tal, 1976). Willingness to sacrifice has been found to be associated with superior couple functioning (Van Lange, Rusbult, Drigotas, Arriaga, Witcher, & Cox, 1997) as well as satisfaction. Preceding research has discovered that sacrifice in the context of a romantic relationship is synonymous with relationship commitment (Stanley & Markman, 1992). Another variable associated with sacrifice is stability. It is stability, high couple functioning, commitment, and satisfaction that have built the theoretical background for willingness to sacrifice (Whitton, Stanley, & Markman, 2002). Earlier research found that couples who resolve conflict by sacrificing their needs for their partner's needs experience greater personal satisfaction (Neff & Harter, 2002). Neff and Harter (2002) also found that someone who is willing to sacrifice for their partner is also more likely to display conflict resolution behaviors. Consequently, the couples

that illustrate conflict resolution and sacrifice in order to maintain a healthy relationship are usually more satisfied in their relationships. The effects associated with an individual's willingness to sacrifice for their partner are a good predictor of longevity. Couples who are more likely to become distressed in their relationship overtime are also the ones who show less inclination to sacrifice for their partner. (Stanley, Whitton, Sadberry, Clements, & Markman, 2006). Much research has examined the strong link between commitment and sacrifice in ongoing relationships (Van Lange, Agnew, Harinck, & Steemers, 1997). When exploring this relationship variable, it is important to consider the role of activity importance in a partner's willingness to sacrifice. Findings suggest that an individual's inclination to sacrifice might be motivated by the activity, and the activity's importance may determine if or when to sacrifice (Mattingly & Clark, 2010).

Satisfaction

When evaluating intimate relationships, it is explicitly important to assess the overall satisfaction of the interaction. Those that are satisfied and gain fulfillment from their interpersonal connections are more likely to stay invested in that relationship. As previously stated, satisfaction has been positively associated with commitment and willingness to sacrifice. Neff and Harter (2002) found that individuals who sacrifice their individual desires for those of their partners experience greater personal satisfaction.

Couple Identity

Earlier research ensures that satisfaction with sacrifice is connected to having a concrete sense of couple identity. Further research conducted on relationships has illustrated that a strong sense of couple identity has a significant correlation to the amount of commitment couples have for one another. Couple identity demonstrates that a person is willing to be united with their partner and not segregated from them. Couple identity can be personified in the way people think about how occurrences affect them. Those that have a strong sense of couple identity with their partner tend to view occurrences as affecting both the individual and the partner. On the contrary, those with weak views of identity look at how occurrences affect them

individually. Couple identity is a true battle amongst the “me” and “we.” Commitment, in the form of couple identity, is essentially a promise to be loyal and unified with someone or something. Therefore, couple identity shows unification and commitment to a significant other (Lambert, Fincham, & Stanley, 2012).

Empathy

A key component of numerous healthy relationships is empathy. Empathy plays an essential part in interpersonal relationships. The word empathy literally means “in-feeling.” The personality component is based on an individual’s internal feelings towards another person (Gerdes, Lietz, & Segal, 2011). Data has shown that individuals who possess a high level of emotional empathy are less likely to engage in aggressive behaviors and more likely to engage in helping behavior when they notice others in distress (Mehrabian & Epstein, 1972). This data suggests that couples who hold higher amounts of empathy exhibit less aggression and more proactive helping. Due to the personality attribute empathy, partners engage in facilitation towards one another. This trait falls hand in hand with individuals exhibiting malleable beliefs. Feelings that can correspond with empathic concern are tenderness, sympathy, compassion, and soft-heartedness (Davis, 1980). When people engage in intimate relationships, they are usually cognizant of the general welfare of their significant other. Current research on empathy has placed huge significance on self-awareness and emotion regulation in experiencing the fullest magnitude of empathy (Gerdes, Lietz, & Segal, 2011).

The purpose of the present study was to examine the relationships between implicit beliefs about relationships, willingness to make sacrifices, couple identity, empathy, and relationship satisfaction. It was predicted that malleable beliefs about relationships would be associated with greater willingness to sacrifice, greater empathy, a stronger sense of couple identity, and higher relationship satisfaction.

METHODS

Sample

Two hundred and one undergraduate students from Texas A&M University-Corpus Christi were used as a convenience sample for this study. All students were

currently enrolled at the university at the time of the study. Of the participants, 138 were female and 63 were male. The ages of the participants ranged from 18 to 56 with a median age of 24.16. Participants answered the survey based on either their current relationship partner or their most recent partner. The percentage of participants that reported being in a committed relationship was 61.2%. Of the sample, 104 identified ethnically as White, 73 reported being Hispanic, 11 said they were Asian, 8 African American, and the remaining 5 identified as Other.

Measures & Procedures

This correlational study utilized six scales that measure five relationship variables including satisfaction, empathy, couple identity, willingness to sacrifice, and fixed and malleable beliefs. The measure for satisfaction (Hendrick, 1988) contained seven total questions that were rated on a 1-5 scale (1= Lowest, 3= Neutral, 5= Highest). The reliability of the satisfaction measure was high. Previous research found reliability of .79 (alpha) for this measure (Rodriguez, Ratanasiripong, Hayashino & Locks, 2014). The measure for couple identity contained six total questions that were scored on a 1-5 scale (1= Disagree, 3= Neutral, 5= Agree). The reliability of the **empathy** questions was substantial and previous research stated a reliability of .90 (alpha) (Stanley, & Markman, 1992). The empathy measurement had a total of fourteen questions that were also scored on a 1-5 scale (1= Disagree, 3= Neutral, 5= Agree). Reliability of this measure was high and earlier research on empathy found reliability for both males and females (Davis, 1980). Willingness to sacrifice contained five scenarios containing two parts each. The first part of the willingness to sacrifice measurement was looking at activity importance and it was rated on a 1-7 scale (1= Not at all important, 4= Neutral, 7= Very important). The second section of this measure was the likelihood you would do this task for your partner and it was rated on a 1-7 scale also (1= Not at all likely, 4= Neutral, 7= Very likely). Both measures illustrate high reliability and past research has demonstrated reliability of .77 (alpha). The implicit theories measurement contained a total of 22 questions: 11 destiny belief questions and 11 malleable belief questions that interchanged between destiny and malleable beliefs. Both measures were rated on a 1-5 scale (1= Disagree, 3= Neutral, 5= Agree). Each

relationship belief scale has been found to be reliable (Destiny beliefs' reliability (alpha) = .82, Growth beliefs' reliability = .74). Participants received an information sheet preceding their decision to contribute to the study. Upon consent from each student, they were given 30 minutes to complete the 61 questions on the relationship survey.

RESULTS

Reliability analyses concluded that the scales for relationship satisfaction (alpha = .823), couple identity (alpha = .829), empathy (alpha = .809), destiny beliefs (alpha = .847), and malleable beliefs (alpha = .734) were all reliable. The willingness to sacrifice scale (alpha = .624) failed to meet the common reliability standard of alpha = .7. Since all inter-item correlations were above +.2, the mean for all willingness to sacrifice items was still used for analysis. Independent t-tests found that female participants ($M = 3.11$) reported greater empathy than male participants ($M = 2.68$), $t(198) = 4.84$, $p < .001$. Participants reporting that they were in a committed relationship were found to score higher in willingness to sacrifice, $t(198) = 3.65$, $p < .001$, couple identity (identified themselves as "us" or "we"), $t(198) = 8.35$, $p < .001$, and relationship satisfaction, $t(198) = 10.03$, $p < .001$. The means for these analyses are presented in Table 1. The relationships between destiny beliefs, malleable beliefs, willingness to sacrifice, relationship satisfaction, couple identity, and empathy were then explored by calculating the correlations between the variables. Table 2 displays the correlation matrix for this analysis. Growth beliefs were found to be correlated with greater willingness to sacrifice, $r(n = 201) = .225$, $p = .001$.

DISCUSSION

We predicted that malleable beliefs would be associated with a greater willingness to make sacrifices within a relationship. The results of the present study support this expectation. Relationship partners who believe that the quality of their relationship depends on the amount of effort they put forth in the relationship are also likely to believe that making sacrifices are part of such an effortful strategy to maintain good relationships. This result extends Knee, Patrick, and Lonsbary's (2003)

conclusions that growth beliefs are a quality of more successful relationships.

We also predicted that malleable beliefs would be associated with a greater sense of empathy. The results of the current study support this notion. Thus it appears that empathy may be a characteristic trait of people with malleable beliefs. Empathy would likely help identify relationship problems and allow a person to work toward repairing such issues. The results of the present investigation add further support to the idea that empathy promotes proactive behaviors (Mehrabian & Epstein, 1972).

We further predicted that malleable beliefs about relationships would be associated with a greater sense of couple identity. This expectation was also supported by the results of the present study. Couple identity shows unification with and commitment to your significant other (Lambert, Finchman, & Stanley, 2012). Couple identity may be the result of high amounts of relationship work done by the partners in a relationship. Partners with malleable beliefs are more likely to put forth such effort in relationships. Future studies might explore this idea by developing a measure of long-term sustained effort in a relationship and exploring such a measure's relationship with relationship commitment.

Finally, it was predicted that malleable beliefs would be positively related to relationship satisfaction. The results of the present study provide strong evidence for this relationship. As suggested by Knee et al. (2001), those with higher growth (malleable) beliefs and lower destiny (fixed) beliefs appear more able to maintain satisfaction in a relationship despite the identification of less than favorable characteristics in their partner.

The results of the present study provide evidence that people's beliefs about their relationships are linked to the quality of the relationships they experience and the personality traits that are assets in relationship maintenance. Specifically, people who establish a mindset that relationships are fluid require great amounts of effort and sensitivity (empathy) to maximize satisfaction and establish a strong sense of couple identity. Future research should further explore the dynamics of relationship beliefs and their connection with maintaining positive relationships.

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TABLE 1.
Means and Standard Deviations for Satisfaction, Willingness to Sacrifice, and Couple Identity as a function of Relationship Status

Measure	Not in a committed relationship			Currently in a committed relationship		
	N	Mean	Standard Deviation	N	Mean	Standard Deviation
Satisfaction	77	2.0785	.87597	123	3.1812	.67157
Willingness to Sacrifice	77	3.3532	1.26153	123	4.0179	1.24690
Couple Identity	77	2.1987	1.03474	123	3.1924	.65008

TABLE 2.
Correlations between Malleable beliefs, Destiny beliefs, Willingness to Sacrifice, Satisfaction, Couple Identity, and Empathy

	Malleable Beliefs	Destiny Beliefs	Willingness	Satisfaction to Sacrifice	Couple Identity	Empathy
Malleable Beliefs	-	.112	.225*	.028	.243	.180
Destiny Beliefs	.112	-	-.021	-.033	-.120	-.065
Willingness to Sacrifice	.225**	-.021	-	.305**	.320**	.233**
Satisfaction	.028	-.033	.305**	-	.542**	.164*
Couple Identity	.243**	-.120	.320**	.542**	-	.174*
Empathy	.180*	-.065	.233**	.164*	.174*	-

NOTE: * = $p < .05$, ** = $p < .01$, *** = $p < .001$ N=201

PROJECT READ 3: THE EFFECTS OF A FAMILY LITERACY PROJECT ON THE EARLY READING SKILLS OF THREE-AND FOUR- YEAR OLDS



by MARLENA GARCIA BUSH

ABSTRACT

A mixed-methods research design study was used to measure literacy acquisition in children age three to four in a family literacy program. Purposive sampling was used to select 11 families (n = 11). Data was collected from the 16 child participants (n = 16). Paired-samples t-tests were used to analyze the mean of Lee's Modified Version of Assessing Book Knowledge scores. Content analysis was used to analyze the depth and complexity of journal writings. Significance was found in the following areas: Understand terms such as story, page, cover, and title, show the front and back of the book, point to a capital letter, and point to a lower case letter. Gains were not found in children's writing development, but on day three and four their writing clearly reflected the story read.

MENTOR
Dr. Corinne Valadez

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INTRODUCTION

Defining family literacy is challenging because it has so many elements and **has been** a relatively new concept in research (Morrow, 2001). What has been agreed upon is family literacy encompasses activities to promote literacy growth through the interaction between family members, not only in a governmental or company financially sponsored program, but also in the home environment. Morrow (2001) states that family literacy is communication between family members that occurs during routines in order to complete daily tasks. Activities in family literacy and family literacy programs include oral language with speaking and reading to children, writing for both parents and children, drawing, songs, and providing parents with reading strategies and other resources in literacy to promote not only their children's literacy growth, but their own as well. In addition, family literacy programs should meet the needs of the families involved, including cultural, community, and literacy learning aspects.

The first family literacy program, Even Start, was founded by the United States government in 1988 with the knowledge that parents are their children's first teacher. Family literacy programs are typically constructed much like the Even Start programs with four components: parent literacy education, child literacy education, parent-child interaction time, and parent

education. Parent literacy education involves providing parents with the necessary skills and strategies to share with their children within the program construct and in their own home environments. Examples of parent literacy education are teaching parents how to make reading aloud to their children more effective and how to promote oral language in their children's daily lives. Child literacy education teaches children about books and language through the use of songs, literacy activities, writing, and reading aloud to them. Parents may then utilize the knowledge they have attained through family literacy programs to share with their children during parent-child interaction time. Parents are teaching their children not only the function of books, but are also teaching them language and how to communicate with activities during parent-child interaction time. The parent education component provides parents with information about how they may continue their own education including assistance with attaining their high school GED, information about college costs and entrance, employment opportunities, and other social concerns.

The Effects of Family Literacy on Literacy Development

Several studies found parents should be provided with the skills and strategies to share with their children while reading at home (Doyle & Zhang, 2011; Lawson, 2012; Sukhram & Hsu, 2012; Lee, 2011). Research conducted on family literacy programs **have** found a common desire by parents to equip themselves with the necessary literacy skills to share with their children. Providing such skills to parents enabled them to promote literacy in a positive way (Sukhram & Hsu, 2012). According to Lee (2011), "Parents may understand which age-appropriate strategies will help build their child's literacy skills so that parents can assist in the vital role in fostering precursors of formal literacy skills" (p. 286). Family literacy programs offer various literacy tools and practices for parents to share with their children, including ways to make reading aloud to their children effective. Lawson (2012) indicates, "If parental reading aloud is an indicator of children's later academic success, it may be effective not only in helping children to develop pre-reading skills but also in developing more complex skills and behavior" (p. 258).

The Contribution of Parent and Child Attitudes to Learning

Attitudes of both parents and children contribute to how much they learn in a family literacy program. In Doyle & Zhang's 2011 study, they indicated that, "Some parents [also] stated that the connection made between why home literacy practices were important and how to effectively implement these practices had a significant impact on their learning" (p. 227). The study also confirmed that the different ways parents interacted with their children with literacy practices were found to be pleasurable for both parent and child, which made the learning experience positive (Doyle & Zhang, 2011). One way parents can interact with their children is reading aloud to them. However, parents may feel uncomfortable reading to their children because they do not have the experience or techniques to use while reading (Lawson, 2012). This should not prevent parents from reading to their children. The act of reading to their children explicitly exposes how books and language work as well as the nature of storytelling: "The more the child experiences being read to, and read to well, the greater will be the strength of memory trace for that experience and its associated feelings of pleasure, pleasure that is directly linked to hearing the musical sounds of the poetic discourse of the narrative written language" (Lawson, 2012). Furthermore, Mullan (2010) found that reading aloud builds positive attitudes. While reading aloud, parents displayed an enjoyment of reading which was then transferred to their children.

Significance of Reading Aloud

Trelease (2001) makes a very clear statement about reading: the more you read, the better you become at reading. He notes how words, which parents can offer to a child free of charge, have value and are beneficial to their child's development. Books provide multiple opportunities for growing and learning about language and its functions. Lane and Wright (2007) confirm that reading aloud to children allows parents to share a love of stories, and by spending time reading aloud, they spend meaningful time together. Trelease (2001) talks about how parents are the advertisers of reading. Like many commercials children view on television promoting their product or show, he states parents should be selling the love for books to their children. In

addition, Trelease states, “Every time we read to a child, we’re sending a ‘pleasure’ message (glue) to the child’s brain” (p. 7).

Print and Phonological Awareness

Justice and Pullen (2003) agree emergent literacy should pay special attention in teaching phonological, written language, and other areas of literacy including children’s knowledge of vocabulary words and should help them be motivated to learn literacy skills. According to Lefebvre, Trudeau, and Sutton (2011), skills in print awareness allow children to understand that “print carries meaning; being aware of environmental print; being able to handle books properly; understanding the directionality of print; being familiar with major book elements such as the cover, title or author; and know the letters of the alphabet.” A 2002 study conducted by Justice and Ezell assessed the acquisition of print recognition, words, and alphabet knowledge and found that children in reading sessions that focused on print showed better performance in post-test measures compared to children who participated in a picture focused session.

METHODS

Participants and Sampling

Purposeful sampling was used to select a total of 11 families (n = 11) with children who were three to five years old. Social media, specifically Facebook, was used to recruit families to participate in the study. While the study was open to both parents and/or caregivers, all of the parent participants for this study were the mothers of the children. In addition, there were 16 children who participated in the study, but data was collected from only 13 of the children participants (n = 13) for the qualitative component of this study. Data collected from three of the children was incomplete and therefore was not included in the study. For the qualitative component of the study, all of the children provided journal samples and data was collected, analyzed, and reported for the purposes of this study.

Instruments

Several instruments were used to collect data for this study. First a pre- and post-activity parent perception survey was administered to assess parents’ perceptions of family literacy practices. Lee’s Modified Version of

Assessing Book Knowledge was used as a pre- and post-activity measurement of children’s awareness of books. Finally, parent journals as well as the children’s journals were used to measure the depth and complexity of children’s journal writing.

Research Design and Analysis

A mixed-methods research design was used for this study. A paired-samples t-test was used to analyze the mean of Lee’s Modified Version of Assessing Book Knowledge scores for the pre-and post-tests with an alpha level of .05. Content analysis was used to analyze the depth and complexity of journal writings by the parents and children. Finally, the pre- and post-activity parent perception surveys were analyzed for patterns and themes.

Procedures

Families participated in a week-long family literacy project. The Family Literacy Project included three main components: parent time, child time, and parent/child together time for a total of two hours per day. During the parent time, thirty minutes was spent on literacy activities parents could use at home with their child as well as using journals to communicate with their child about a shared reading. Thirty minutes of parent time was used to feature a guest speaker. Each day featured a different guest speaker. Topics included literacy, wellness for the family, community resources, and health. Child time consisted of four 15 minute blocks: journaling, songs/movement, literacy activities, and art. Parent/child time was the final 30 minutes and consisted of parents reading to their child and incorporating strategies learned during Parent Time. Families received three free books each day for four of the five days of the program for a total of twelve books. Families completing the five-day program received a \$25 gift card from an area grocery store.

RESULTS

Research Question One

Question one of this research study asked how parent involvement in a family literacy project affects the early literacy skills acquisition of three to four-year olds.

Parents’ initial and final reading perception survey responses (Appendices B & C) adapted from Sukhram

and Hsu's 2012 study were evaluated for themes and patterns. A content analysis on the initial and final parent perception survey yielded the following themes: program, book choice, motivation, reading to children, and concerns.

Program

In the category of program, parents were very receptive to information provided to them about different genres of reading and literacy activities to use while reading aloud. The parents displayed an appreciation and found value in the program, as many of them stated they wished the program was longer. Parents stated the guest speakers were enjoyable and found the daily literacy activities to be helpful for both the children and parents. In the final parent reading perception survey, parents answered with entries about what they have learned from the reading program. Many of the parent responses included having learned how to engage and involve their children in the story while they are reading aloud. Parents responded that they learned to ask their children questions related to the story while reading in efforts to "expand your child's thinking ability" as one parent stated. Three parents responded in the survey that they found learning from the program to be positive reinforcement validating the activities and behaviors they had already been practicing with their children while reading at home. One parent, who responded differently from all other parents stated, "I never realized that children this little could journal. I was amazed at her journals."

When parents were asked to answer what they liked most about the reading program, six parents responded to having liked how their children were excited about attending and actively engaged in the daily literacy activities. For example, one parent responded, "I love that her confidence in reading was built up" while another parent noted "how excited my son was to be a 'reader' and to go to school." Three parents responded with appreciation for the guest speakers who spoke to the parents on varied topics including reading, health and nutrition, and continuing their own education. Two parents included in their responses what they liked most was what they learned about how to teach their children to read and what to focus on when reading aloud. Three parents expressed their love for the

program as well as their gratitude for having been able to participate.

Book Choice

From the initial parent surveys, every parent stated they allow their children to choose the books they read to them. Books were commonly read from the home library and in three households, families read books chosen from their local library. A couple of parents stated the choice of books the children picked to have read to them were not interesting. The books were not interesting to the parents because they were either too long or the subject matter of the book was not interesting to the parent.

Motivation

The reading program was found to influence parents by motivating them to ask their children questions while reading and to read to their children more often. One parent noted what influenced them was learning the importance of reading while another parent stated that the program influenced them "to make a conscious effort" to read to their child.

Reading to Children

Overall, the families found reading to their children important. In all eleven households, every parent agreed that they enjoyed reading with their children. Reasons for parents enjoying reading time with their children varied from spending time together to seeing the interest and inquisitive behaviors the children displayed while being read to. One parent stated, "I enjoy one-on-one time with him and how he wants to know more and his 'Why's?'" Overall the parents answered that the reason they know their children enjoy reading is because the children ask to be read to. Parents also stated they see their children display excitement when interacting with books which also confirms their beliefs that their children are enjoying reading time. When parents were questioned what special times they read to their children, eight parents responded with "before bedtime" while the remaining three parents responded with different entries included during school time, between two to four times a week, and every morning or when the child asks to be read to. Parents were asked to respond to a question asking what they found least interesting about reading to

their children. Three parents stated that what was least interesting to them was when their children wanted to be read the same story over several times.

Concerns

Parents were asked to express their concerns about reading, and a majority of parents showed concern over approaching instruction for teaching their children how to read. Furthermore, two parents expressed interest in learning more about the relationships between print and phonemes. Of the eleven parents questioned, five parents responded with no concerns pertaining to reading. When parents responded by offering suggestions for future family literacy programs, the responses were positive and displayed a desire for the duration of the literacy program to be longer. One parent suggested having the program earlier in the day, instead of the afternoon, which would be better for other parents' schedules and attendance. Three parents stated they would like to know more about future family literacy programs.

Children's Book Knowledge Assessment

Paired samples t-tests were used to analyze the pre- and post-measures of Lee's Modified Version of Assessing Book Knowledge Assessment (Appendix A) to evaluate the impact of a family literacy project on three- and four-year-olds' literacy acquisition skills. In the category of book knowledge (Table 1), significance was found in the following areas: understand terms such as story, page, cover, and title, show the front of the book, and show the back of the book. For understanding terms such as story, page, cover and title, there was a statistically significant increase from pre-assessment ($M=.85$, $SD=.69$) to post-assessment ($M=1.38$, $SD=.65$, $t(12)=-2.50$, $p<.028$). The eta squared statistic (.34) indicated a large effect size. For showing the front of the book, there was a statistically significant increase from pre-assessment ($M=1.30$, $SD=.95$) to post-assessment ($M=1.77$, $SD=.60$, $t(12)=-2.14$, $p<.053$). The eta squared statistic (.28) indicated a large effect size. For showing the back of the book, there was a statistically significant increase from pre-assessment ($M=1.30$, $SD=.95$) to post-assessment ($M=1.77$, $SD=.60$, $t(12)=-2.14$, $p<.053$). The eta squared statistic (.28) indicated a large effect size. In the category of print knowledge, significance was found in the following areas: point

to a capital letter and point to a lower case letter. For pointing to a capital letter, there was a statistically significant increase from pre-assessment ($M=.30$, $SD=.75$) to post-assessment ($M=1.0$, $SD=1.0$, $t(12)=-2.64$, $p<.022$). The eta squared statistic (.37) indicated a large effect size. For pointing to a lowercase, there was a statistically significant increase from pre-assessment ($M=.85$, $SD=.99$) to post-assessment ($M=1.30$, $SD=.95$, $t(12)=-2.14$, $p<.053$). The eta squared statistic (.28) indicated a large effect size.

Research Question Two

Question two of this research study asked how participation in a family literacy project affected the depth and complexity of children's journal responses to reading aloud.

This study sought to analyze the depth and complexity of children's writing and the impact the family literacy project would have on their wiring. The data collected did not show evidence to support whether or not their participation in this project would lead to growth in their writing due to the short duration of the study. While students engaged in journaling activities, there was not an increase in the amount of writing produced by the children. All children remained at the same level of writing development in which they entered the study (see Table 3). However, while there was a not gain made in their writing development, it is interesting to note that on day three and four their writing very clearly reflected the story read.

On day three, the story read was *Chicka Chicka Boom Boom*. Almost every writing sample collected for that day included a drawing of a tree, letter, or letter like strings. Day four, the story was *The Very Hungry Caterpillar*; again every writing sample collected had drawings that included butterflies, caterpillars, or the food consumed by the caterpillar in the story. Both examples (see figures 1 & 2) clearly demonstrate that the children's journal writing was in response to the story read.

TABLE 1.
Paired Samples T-Test Book Knowledge

Question	Mean	Standard Deviation	t	df	Sig. (2-tailed)
Hold book in upright position?	-.077	.77	-.37	12	.72
Turn pages left to right?	.23	.73	1.15	12	.27
Look at left page before right page?	.15	.69	.81	12	.44
Indicate top edge or toward top?	.00	.41	.00	12	1.00
Indicate bottom edge or toward bottom?	.00	.41	.00	12	1.00
Use cover illustration to predict story?	-.38	.77	-1.81	12	.10
Use illustration to make predictions?	-.38	.77	-1.81	12	.10
Use book title to predict what story is about?	-.38	.87	-1.60	12	.14
Understand terms such as story, page, cover & title?	-.54	.78	-2.50	12	.03
Show the front of the book?	-.46	.78	-2.14	12	.05
Show the back of the book?	-.46	.78	-2.14	12	.05
Show where the title is?	-.69	1.18	-2.11	12	.06
Show where the story begins?	-.15	.99	-.56	12	.58

TABLE 2.
Paired Samples T-Test Print Knowledge

Question	Mean	Standard Deviation	t	df	Sig. (2-tailed)
Point to pictures to show where you read?	.38	1.04	1.33	12	.21
Point to words to show where you read?	.46	1.13	1.48	12	.17
Point to pictures on left page and right page using finger?	.08	.86	.32	12	.75
Point to words on left page and right page using finger?	.31	1.03	1.08	12	.30
Understands print proceeds from top to bottom?	-.38	.87	-1.60	12	.14
Know where a letter is?	.15	.80	.69	12	.50
Know where a word is?	.08	1.12	.25	12	.81
Understand pictures are viewed/print is read?	.00	.71	.00	12	1.00
Point to a capital letter?	-.69	.95	-2.64	12	.02
Point to a lowercase letter?	-.46	.78	-2.14	12	.05

FIGURE 1.

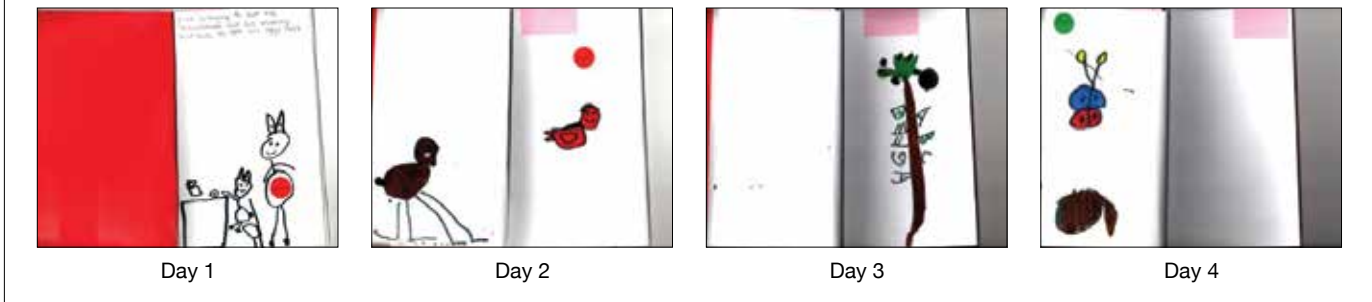


FIGURE 2.

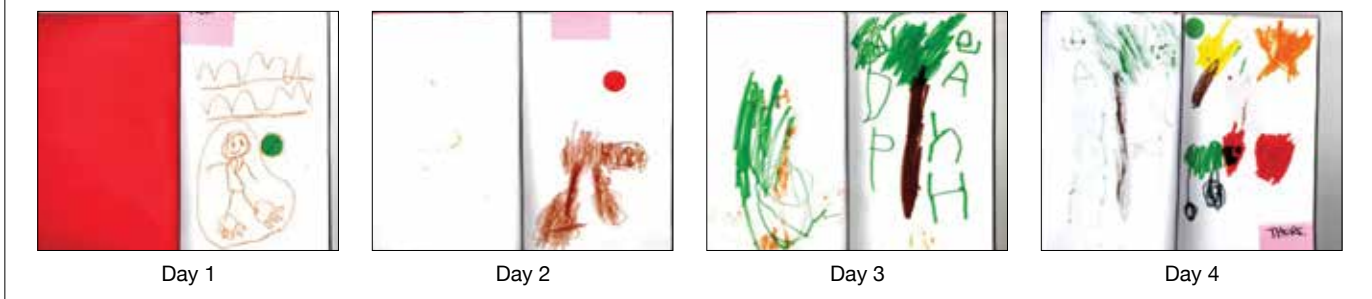


TABLE 3.
Assessment of Students' Writing Ability

Child	Age	Day 1 Monday <i>Max's Breakfast</i>	Day 2 Tuesday <i>Brown Bear Brown Bear, What Do You See?</i>	Day 3 Wednesday <i>Chicka Chicka Boom Boom</i>	Day 4 Thursday <i>Very Hungry Caterpillar</i>
1	5	D/S	D/S	D/WLU or LS	D
2	2	D/S	D	D/S	D/S
3	4	D	D	D/LLF	D
4	4	S/LLF	D/S	ABSENT	D/S
5	4	LLF	D	D	D
6	4	D/S	D	D/LLF	ABSENT
7	4	D/LLF	D	D/NLU or LS	D
8	3	D	D	D	D/S
9	4	LLF	S/D	D/LLF	D
10	4	D/S	D	D/WLU or LS	D
11	5	D	D	D/WLU or LS	D
12	4	D	D	D/LLF	D
13	3	S/LLF	D/S	D/S	D/S
14	2	S	S	S	S
15	4	ABSENT	D/S	D	D/S
16	3	ABSENT	D/S	S	ABSENT

Stages of Writing Ability as Identified by Sulzby (1985).

D = Writing via drawing | S = Writing via scribbling | LLF= Writing via making letter-like forms
 WLU or LS = Writing via reproducing well-learned units or letter strings | *IS = Writing via invented spelling
 *CS = Writing via conventional spelling | *not applicable due to children's stage of writing

DISCUSSION

The focus of this study was to determine how parent involvement affects the literacy acquisition of three- and four-year-olds in a family literacy program. In addition, this study examined the complexity of the children's journal drawings in response to stories read aloud. The findings of this study conclude that parental involvement has had significant impact on the development of literacy in children in a family literacy program. The findings are consistent with Doyle & Zhang's (2011) study of participation structure and parent engagement in family literacy programs in which different interactions between parents and children were found to be enjoyable for both, thus making the learning experience a positive one. The parent surveys displayed a substantial amount of support for reading and books. The major findings were that children are able to learn book knowledge concepts such as understanding terms like story, page, cover, and title in a short period of time. While the children were able to understand these terms, they could not identify the title. In addition, children were also able to learn the directional function of books such as knowing where to locate the front and the back of the book. Furthermore, the results display that children were able to learn and distinguish both capital and lower case letters. The complexity of the children's drawings did not change while participating in the family literacy project. The journal entries displayed writing stages such as drawing, scribbling, letter-like forms, and reproducing well-learned units or letter strings. Although the children's drawings exhibited both constant and multiple stages of ability, there was not enough evidence to demonstrate that children were able to attain substantial growth in their writing ability. Parents recognized the value of repeated readings and discovered their children were actually able to journal, which they found surprising. Increases in literacy are often due to children's maturation. In this case, the program duration was only five days, which can't be attributed to maturation and therefore can't be generalized. There needs to be further studies to investigate intensive purposeful instruction in the areas of directionality, ability to distinguish capital and lower case letters, identifying titles, and so forth, which did have an impact in the participation in this study. These findings show potential for teaching children who lack literacy skills due to low social-economic status or other reasons with concentrated instruction in family literacy programs to prepare them for entering pre-school.

LIMITATIONS

The study contained several limitations. First, the Read 3 program, which was new to the area, does not have sufficient advertising to recruit families into the program. Another significant limitation to the study was the time period in which it was held. In the past, the program ran for a total of six weeks. In this study, however, the program was held for only five days. The Read 3 program curriculum was created to focus primarily on nutrition with the use of books which limited the ability to focus on literacy activities. The research required the researcher to modify the curriculum to include both Read 3 curriculum design and literacy activities focusing on print, phonemic awareness, and book knowledge.

CONCLUSION

According to Mullan (2010), parents are an important element and are influential in helping their children learn how to read. Moreover, parents leave a positive influence on the development of their children's reading (Mullan, 2010). A family literacy program allows parents and children to interact socially with each other and develop positive attitudes and experiences towards literacy. Family literacy programs provide techniques for parents to use while reading to their children. When parents share reading a book with their child, they are not only modeling a pleasure for reading, but they are also teaching their children the sound qualities and relationships that involve letters and words (Lawson, 2012; Trelease, 2001). We might think that learning to read starts at school from teachers' explicit instruction, looking at books, and reading aloud. Learning to read, at its emergent stages, from book handling, to letter recognition, to print knowledge, actually starts in the home with parental involvement. Parents serve as a child's first teacher. Thus, teachers must value the impact parental influence has on a child's literacy development. Teachers and parents working together, building reading skills including **phonological, print, and book awareness**, while reading aloud to children, can help them gain necessary emergent literacy skills. Parents who gain effective literacy skills through a family literacy project and share that knowledge with their children by modeling positive attitudes towards reading can greatly benefit their literacy development and prepare them for academic success.

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APPENDIX A:**Lee's Modified Version of Assessing Book Knowledge**

Book handling knowledge

This child can....

- Hold book in an upright position
- Turn pages left to right
- Look at left page before right page
- Indicate top edge or toward top when asked if s/he can show me the top of the page
- Indicate bottom edge or toward bottom when asked if s/he can show me the bottom of the page
- Use cover illustration to predict what the story is about
- Use illustration to make predictions
- Use book title to predict what the story is about
- Understand or use terms such as story, page, cover, or title
- Show me the front of the book
- Show me the back of the book
- Show me where the title is
- Show me where the story begins (where to start reading)

Print knowledge

This child can....

- Point to pictures when asked to show me where s/he reads
- Point to words when asked to show me where s/he reads
- Pointing to pictures on the left page and the right page by using a finger when asked to show me where s/he reads
- Pointing to words on the left page and the right page by using a finger when asked to show me where s/he reads
- Understand that print proceeds from top to bottom
- Know where a letter is (name or point to a letter when asked; use the term conventionally during conversations)
- Know where a word is (name or point to a word when asked; use the term conventionally during conversations)
- Understand that pictures are viewed and print is read
- Participate in reading when the language is predictable
- Attempt to match voice with print
- Point to a capital letter when asked
- Point to a lowercase letter when asked

APPENDIX B:**Initial Parent Reading Perception Survey**

Parent's Name: _____

Child/Children's Name: _____

1. ___ How do you select a book to read with your child/children?
2. ___ Do you enjoy reading with your child/children? Why/ Why not?
3. ___ What do you enjoy the most about reading with your child/children?
4. ___ Are there special times when you read with your child/children?
5. ___ What is the least interesting thing about reading with your child/children?
6. ___ Does your child enjoy reading? How do you know this?
7. ___ What questions or concerns do you have about reading?

APPENDIX C:**Final Parent Reading Perception Survey**

Parent's Name: _____

Child/Children's Name: _____

1. ___ What did you learn from this reading program?
2. ___ What did you like the most about the program?
3. ___ How has this program influenced how you read with your child/children?
4. ___ What suggestions do you have for us about the program?

THE EFFECT OF NEGATIVE INFORMATION ON THE JUSTIFICATION OF CHOSEN ALTERNATIVES

by AMIE MACKAY

ABSTRACT

In a study of the justification of unethically manufactured goods, 93 female undergraduate students were asked to rank order the quality of 3 similar shirts. After completing this task, participants were told that their top choice was made by an Italian designer, a Los Angeles Designer, or in an Indonesian sweatshop (unethical practice). Participants then made ratings of the quality of each shirt. It was expected that learning that the top-choice shirt was made in a sweatshop would generate aversive tension (dissonance) that participants could relieve by rating the shirts higher in quality. Results confirmed this expectation. Top-choice shirts that participants were told were made in a sweatshop were judged to be higher in quality than the other shirts, $F(2, 91) = 4.02, p = .02$. Results are discussed in terms of the role attitude justification may play in the perpetuation of unethical behavior.

MENTOR

Dr. ??

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xx

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The Effect of Negative Information on the Justification of Chosen Alternatives

As consumers, we pride ourselves on our ability to judge the quality of the products we choose to make our own. As part of this process, we weigh the pros and cons of our different options. For example, in choosing a cell phone we have dozens of options. We take into consideration the appearance of the phone, its features, and the reputation of the product's manufacturer. Eventually we identify what we believe to be the best option and defend our decision to the world. What would happen, however, if we found out after publically announcing our chosen alternative that the product's manufacturer operated in a very unethical manner? Would we immediately reevaluate the quality of the product in a negative way so that we distance ourselves from such a purchasing decision? Or would we, on the other hand, choose to justify our decision by reevaluating the quality of the product in a positive way? The present study attempts to explore these questions in the context of fashion choices that people make.

The garment industry has historically utilized and thrived on the use of sweatshop manufacturing. Sweatshop factories hire employees that work extensive hours in unregulated working conditions while receiving low wages (Arnold & Bowie, 2003). Profits gained during the manufacturing process are *sweated out* by forgoing

health, safety, and infrastructure regulations and maximizing human productivity by paying employee wages that are below sustenance and forcing overtime (Radin & Calkins, 2006). Sweatshop employees are required to work as much as 80-90 hours per week, earning wages between \$0.10 and \$0.20 per hour (Emmelhainz & Adams, 1999). Roughly 250 million children ages 5-14 are working as forced laborers in developing countries (Basu, 1999).

Garment factories are attracted to undeveloped countries for their availability of cheap laborers, low taxes, and lenient rules governing the world textile trade. According to Rudell (2006), the expansion of international trade and increased globalization of business have facilitated increasing amounts of sweatshop manufactured goods to be imported to the U.S. According to the National Labor Committee, employees sewing NBA jerseys make \$0.24-\$0.29 for a jersey that will later be sold for \$140. (Lorette, 2014). Domestically, companies have progressively sought cheap labor from foreign manufacturers—increasing from 2% of imported goods in 1960 to 66% of imported goods in 2001 (Powell & Skarbeck, 2006). As long as the industry continues to expand and globalize and consumers demand low-priced goods, apparel produced in sweatshops will continue to exist (Greenhouse, 2002).

Due to repeated allegations of manufacturing through the use of foreign sweatshops, large corporations – Nike, The Gap, Disneyland, Wal-Mart— have started to require that their factories are inspected and employees are interviewed. Due to insufficient personnel staff for supervision, these attempts at ensuring safety, health, and infrastructure standards have been futile at best (Pastor, 2005). Stock markets convey information rapidly, enabling public disclosure campaigns to contribute to declining corporation revenues resulting from disclosure of sweatshop manufacturing (Rudell, 2006; Rock, 2003). In an anti-sweatshop movement conducted on college campuses, students demanded that merchandise with their school's emblem be produced by factories with regulated working conditions (Pookulangara, Shephard, & Mestres, 2011). A study investigated consumer preferences on apparel manufacturing and found that 86% of participants were willing to pay more for products produced from No Sweat manufacturers that guaranteed safe and fair labor

conditions for employees. Around 66% of participants indicated their willingness to boycott companies that practiced unregulated working conditions (Dickson, 2001).

According to Festinger (1957), cognitive dissonance is the unpleasant experience resulting from the realization of maintaining two incongruent cognitions—thoughts, beliefs, or perceptions. Cognitive dissonance is an unpleasant drive state—similar to thirst or hunger—that motivates the person experiencing the discomfort to reduce the dissonance by justifying their behavior or reassessing external circumstances. The greater a person's commitment or involvement is to a behavior, the fewer resources they will find available for supplying external justification. This scenario results in a strong unpleasant drive state that necessitates robust self-justification, in order to effectively reduce dissonance. Prominent dissonance requires powerful validation of the self as being morally good in order to convince the self that no deception or immoral behavior was involved (Aronson, 1969).

According to Aronson (2004), people are initially rational when they are about to make a decision, seeking out information for weighing relevant advantages and disadvantages for each option. After a decision has been made, people stop considering information about all options and instead focus on features of the option they have selected. Brehm (1956) examined post-decision dissonance in a study where participants were asked to rate the attractiveness of various kitchen appliances. Following their initial evaluations, each participant was allowed to select which appliance, out of two similarly rated options, they would like to take home. After making their decision, participants were asked to rate all the appliances again. After receiving their gift, participants focused on the desirable aspects of their appliance of choice, while disregarding the desirable aspects of the appliance they did not select.

Bandura (1999) explains that people attempt to belong as moral agents in society by following moral conduct for self-regulatory behavior. In this paper we suggest that when a person learns that a judgment they have previously made public is later tainted by information suggesting that his or her judgment has a connection to immorality, dissonance will result. Dissonance

reduction, the process of decreasing uncomfortable psychological states that arise from discrepancies of cognitive systems (Bastian, 2011), should then motivate self-justification in a way that will best preserve one's sense of being a moral agent. Of particular relevance to the present study, dissonance theory suggests that the individual will alter the perception of the behavior to correspond with their self-concept in order to relieve the aversive arousal generated by inconsistent cognitions.

In the current study, the participants were asked to examine three similar articles of clothing (shirts) and decide on which shirt they liked best. Later, some of these participants found out that the shirt they publically announced liking the best was made in an unethical manner (in an Indonesian Sweatshop). For such participants, the cognition that they selected the shirt they found most appealing is dissonant with the fact that the shirt was manufactured in a sweatshop. In addition, the positive aspects of the alternative shirt options are dissonant with the participant's cognition that they did not select a shirt from a company with ethical manufacturing practices. One possible way for participants to reduce dissonance is by focusing on the desirable features of their favored shirt, while paying little attention to undesirable features. Following a decision, people look for evidence that reaffirms confidence in their decision and reassures the merit of their judgment (Ehrlich, Guttman, Schonbach, & Mills, 1957; Aronson, 2004).

The present experiment attempted to examine the effect on post-decision evaluations of participants' favored shirts after informing participants that their shirt of choice was manufactured in a sweatshop. We predicted that participants who received information that their chosen shirt was made in a sweatshop would rate their favorite shirt more favorably than if told that the shirt was made in a manner not associated with immorality.

METHOD

Participants

One hundred and eleven female students enrolled at Texas A&M University-Corpus Christi were recruited to participate in a "shirt quality evaluation" study. Of those, 93 (age range 18-33 years; $M = 24.98$) participants were included in the final analysis. The participant sample

consisted of 41.5% students who identified themselves as Hispanic or Latino and 34% students who identified themselves as white or Caucasian. Participants were randomly assigned to the experimental conditions.

Materials and Procedure

Participants were provided with an information sheet that explained the nature of the survey and task that they were asked to complete. The experimenter read the information sheet aloud to participants. Following this, any participants that did not wish to continue with the study were excused. Participants were then asked to examine three women's shirts and indicate which shirt was their personal favorite. All three shirts were turquoise, button-up, collared, lightweight, and were comparably sufficient for the purposes of this study. The favored shirt was recorded by the researcher, who then disclosed the companies from which each shirt was manufactured. The favored shirt of the participant was, in itself, arbitrary. Regardless of the participants' first choice, participants were randomly assigned to one of three conditions. A third of the participants were told that their favorite shirt was manufactured by a contractor from an Indonesian sweatshop. Another third were told that their favorite shirt was manufactured by an American designer in downtown LA. The final group of participants was told that their favorite shirt was manufactured by a fashion designer in Italy. Participants were also told that their second and third choices were manufactured by the other designers not already identified.

The researcher instructed participants to read three short paragraphs providing background information on each company and then to fill out the remainder of the *experimental survey/questionnaire*. The description of the Indonesian sweatshop included information that clearly identified that the shirt was made in an unethical manner. The descriptions of the other two companies contained no such information.

The survey itself was composed of basic demographic questions—gender, age, ethnicity, and field of study—followed by shirt quality survey questions. All participants remained anonymous throughout the data collection process involved with this study. Following the demographic component of the survey, participants used 5-point Likert scales, with endpoints 1 (dislike completely) and 5 (agree completely), to assess the quality of each shirt. Participants' answers reflected

the extent to which they agreed or disagreed with the following statements:

1. *I enjoy looking at the shirt-- It is aesthetically pleasing.*
2. *I am pleased with the way the shirt was manufactured.*
3. *I am fond of the fabric used in this shirt.*
4. *I believe the manufacturing of this shirt allows for long-term use of the shirt-- It is durable.*

After assessing shirt quality, participants were asked to indicate the dollar amount that they considered appropriate for each individual shirt. Participants completed ratings and estimates for each shirt. After completing the survey, participants were thanked for their participation and excused.

RESULTS

Participants' top choice shirt ratings (aesthetic, manufacturing, fabric, durability, and price) were analyzed using a series of one-way ANOVAs and planned contrasts designed to compare sweatshop means with the other two shirt manufacturers. The means for these analyses are presented in Table 1. These analyses revealed that participants rated first choice shirts higher in aesthetic quality when they were told that the shirt they had chosen was manufactured in an Indonesian sweatshop as compared to a LA designer, $t(91) = 7.608, p < .001$, or an Italian designer, $t(91) = 7.009, p < .001$. Similarly, participants rated first choice shirts higher in fabric quality when they were told that the shirt they had chosen was manufactured in an Indonesian sweatshop as compared to a LA designer, $t(91) = 2.434, p = .017$. The difference between the sweatshop and Italian designer approached significance in the expected direction, $t(91) = 1.909, p = .059$. Participants' price estimates for shirts was found to be higher for first choice shirts when they were told that the shirt was manufactured in a sweatshop as compared to a LA designer, $t(91) = 2.044, p = .044$. An overall index of first choice rating scores was calculated by standardizing each rating and then calculating the mean of all five standardized ratings. Overall ratings (see Figure 1) were found to be higher for shirts they thought were manufactured in an Indonesian sweatshop as compared to a LA designer, $t(91) = 2.753, p = .007$, or an Italian designer, $t(91) = 2.05, p = .043$.

DISCUSSION

It was predicted that participants who were told that their favorite shirt was manufactured in a sweatshop would be motivated to justify their decision by rating the quality of those shirts higher than participants whose favorite shirts were manufactured in downtown LA or Italy. The results of the present study were supportive of this prediction. Participants who were told that their favorite shirt was made in an unethical manner (Indonesian sweatshop) rated the shirt higher in quality than participants who did not receive such information. As such, the findings of this study are consistent with that of previous research on post-decision dissonance (Brehm, 1956; Ehrlich, Guttman, Schonbach & Mills, 1957).

As absurd as it may seem, the results of the present study suggest that receiving information that casts a negative shadow on previous judgments may actually strengthen our conviction in those initial judgments. Historical examples of devotion to post-decision justifications provide insight into our dedicated to poor choices. Throughout religious sects, various promises and prophecies have been made by leaders that later prove to be fictitious. Proceeding from these instances of deception, religious followers often become more united with the group and strengthened in their confidence and adherence to their beliefs.

Knox & Inkster (1968) have demonstrated the significance of irrevocability by interviewing people on their way to and from placing bets on a race. Participants who were returning from placing their bets indicated greater confidence and certainty than those who had not yet made their final bets. Prior to making a commitment, justification of one's decision is unnecessary. Dissonance occurs when a difficult decision cannot be changed or remade, which motivates individuals to reduce the dissonance in order to reassure themselves that they have made a wise and sensible choice. Once a commitment has been made, people are more likely to engage in subsequent behaviors that require even greater commitment than the initial decision (Freedman & Fraser, 1966).

Results of this study could be furthered through subsequent studies that examine the actual apparel purchasing behaviors of participants. The present study was limited because it did not examine participants' attitudes concerning sweatshop manufacturing. The

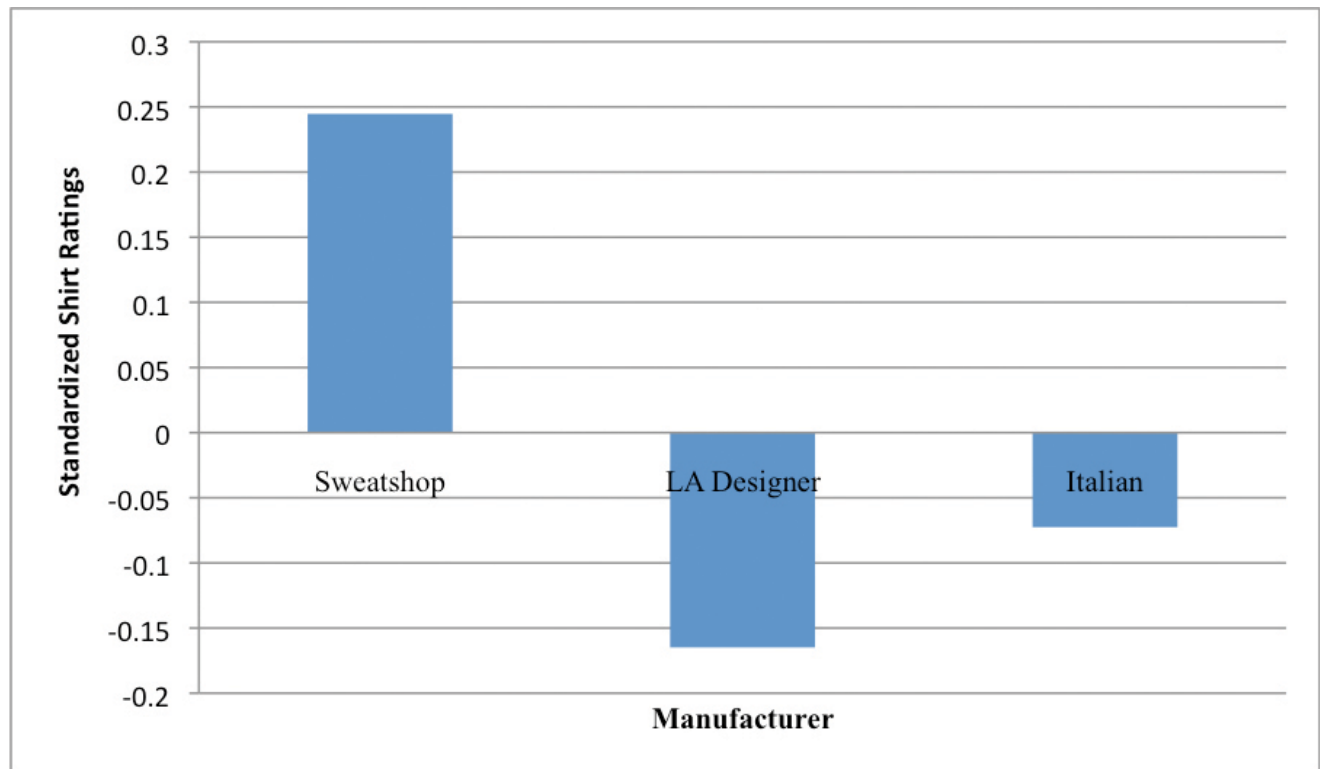
present study could be extended through multiple variations of the experimental design. Surveying participants about their apparel purchasing background and their intentions for future purchases would provide further insight into the processes of post-decision dissonance. Additionally, the present study could increase the salience of the stimuli by informing participants that they would be allowed to keep the item they selected (Brehm, 1956). Future studies could include male participants and their evaluations of the quality of shirts for men.

As consumers, we are confident in our abilities to assess product quality and select products that best suit our needs. By understanding the effects of post-decision justification on consumer behavior, we enable ourselves to become more knowledgeable, responsible, and ethical consumers.

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FIGURE 1.
Average Standardized Shirt Ratings as a Function of Manufacturer Feedback



APPENDIX A.
Means and Standard Deviations for
Shirt Ratings as a Function of Manufacturer

Rating	Manufacturer		
	Sweatshop	LA Shop	Italian Designer
	M(SD)	M(SD)	M(SD)
Aesthetic Quality	4.81(.40)	3.03(1.14)	3.10(1.08)
Fabric Quality	3.61(1.20)	2.91(1.64)	3.04(1.11)
Manufacturing	1.65(1.28)	1.91(1.11)	2.21(2.19)
Durability	2.23(1.12)	2.59(1.18)	2.41(1.20)
Price	16.81(5.70)	13.68(6.90)	15.38(5.73)

DESIGN AND DEVELOPMENT OF CARANGIFORM PIPE INSPECTION DEVICE

by CASSANDRA MANZATO



ABSTRACT

The major problem in nuclear power plants is pipe corrosion and degradation. The failure of pipe function leads to dangerous facility environments and dangerous health conditions for the workforce. With close inspection and documentation of pipe conditions and quality, preventable measures can be taken. Currently many power plants use pipe inspection devices for detection of cracks and leakages, but these devices are large and cumbersome during the turn-around period of plant shutdown where time is critical. This paper investigates the function of smaller inspection devices that allow for easier application and monitoring of the water feed piping system for the power plant. Application is used from previous pipe inspection gadgets, and inspiration for a new type of movement is taken from carangiform locomotion. Geared with sensors for thermal source detection

and infrared, the fish-like robot will have more agile motion than previous in-pipe inspection gadgets.

INTRODUCTION

Nuclear power plants utilize extensive piping systems in electric generation, but the pipes and other components for the plants are subject to factors of degradation, deterioration, and imperfections that can major damage due to failures. A thorough inspection process is needed before rupture and leakage occurs to save time and resources for power plant facilities. Currently, pipeline condition inspection occurs with the use of Inline Inspection tools (ILI). These ILI tools have various abilities and recording possibilities for later data analysis. Such detection technologies range from using magnetic flux leakage to ultrasonics. The first intelligent ILI was run by Shell Development in 1961 and was a self-contained electronic instrument that traversed pipelines while measuring and recording wall thickness and used electromagnetic fields to sense wall integrity. Many ideas have been developed for in-pipe inspection devices, and designing a shape for the use of detection is the purpose of this research. Determining a favorable shape and driving motion, along with setting the potential of additional sensors is the objective of this research.

MENTOR
Dr. Lea-Der Chen

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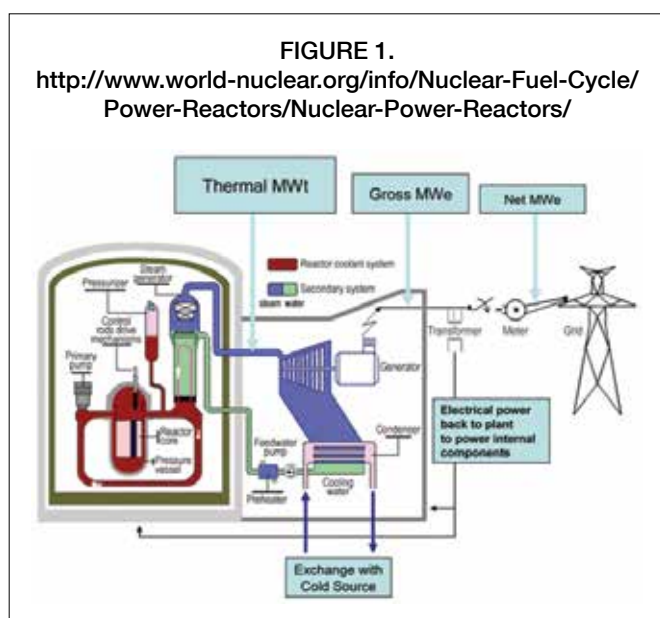
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Dept. of Science and Engineering

BACKGROUND

The purpose of nuclear power plants is to utilize a nuclear reaction in which large amounts of energy are dispelled and used as heat to make steam that rotates a turbine for electrical generation.

The large amounts of heat are dispelled from the reactor, and coolant is needed to transfer the heat into a usable source of energy. The heated coolant is transformed into steam which runs through a turbine and rotates a generator that produces the electricity. Another heat exchange is used with the feed water to absorb any extra heat from the coolant before it returns to the reactor.



Nuclear power plants have a history of failures due to pipe damage. These failures, if not caught in the early stages, could result in massive destruction of the plant itself and the health of the employees. Although some pipes do not carry reactive waste, failure of these pipes still cost the plant time in operation. In October of 2011, the Karachi Nuclear Power Plant imposed a seven-hour emergency shutdown after coolant leaked from a feeder pipe to the reactor (Aziz, 2011). Other recent reports of accidents are attributed to degrading pipe metals, such as the deteriorated underground pipes in Vermont Yankee Nuclear Power Plant that leaked radioactive tritium into groundwater, and the weakened storage tanks that leaked one million gallons of reactor byproducts into the Columbia River in Washington (Vermont Department of Health, 2014). To prevent disaster from occurring, continuous safety

checks and close inspections are necessary. For full safety inspections, a plant is shut down. This period is known as a turnaround. All machinery is checked, inspected, and measured for any indications of deterioration, life span, and potential dangers. The plant is then reassembled and restarted, and no further inspection of the pipes to such a degree is done until the following turnaround.

Common causes of pipe failure are from construction, manufacturing, and constant daily wear, causing corrosion and degradation.

During the construction process of power plants, pipes can be damaged during installation due to use of levers to align pipes, cracks due to chloride stress corrosion, cracking caused by leftover vinyl tapes from the construction stage, excessive stress caused during installation, insufficient wall thickness due to slight eccentricity between pipe and thinning machine, and leakage from a plastic effluent pipe due to incorrect pipe material. Other construction factors such as welding play a part in potential rupture, as crack indications between bi-metallic welds are misinterpreted specifically between the buttering and base material (Zerger & Noel, 2011).

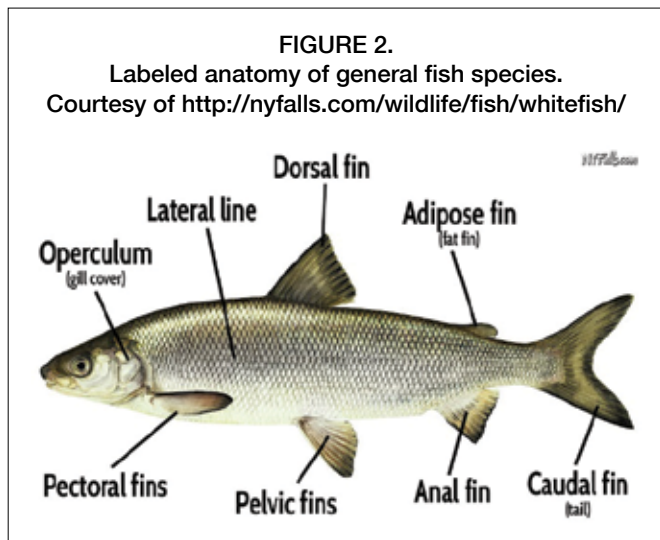
Corrosion for the water feed pipe system is the largest trigger for failure in the area consisting of the feed water pump, heat pumps and steam generation. In 1989, after a severe piping rupture at Surry Power Station, new regulations were initiated on pipe inspections to prevent failure from erosion/corrosion damage. The evaluation method is based on thickness measurements through the carbon steel piping system. The equation for measuring erosion/corrosion wear is the difference in the piping thickness: $T_{ec} = (\text{previous measured thickness}) - (\text{present measured thickness})$. The difference will support total wear. To find the rate, the total wear (T_{ec}) is divided by the number of hours since operation between measurements (Ting & Ma, 1999). Using these equations it was formulated that the section from the feed water pump to the heat pump has a life of 16 years. Comparatively, this life span is in the lower end of the equipment life cycle. This is the reason for focus of the research, to understand when and where most of the corrosion occurs in the system with degradation and pipe thinning.

BODY TYPE

Determining a favorable shape for the inspection device and procuring a favorable driving motion along with setting the potential of additional sensors requires a combination of inspiration and ingenuity.

The slender form of a fish body meets the requirements for a pipe inspection device. The smooth undulating motion and low drag during movement are evolutionary traits to exhibit efficient motion. (Triantafyllou, Michael, & George, 1995). Taking into consideration the winding pipe system, an agile body is needed to quickly turn and rotate. A fish's body is designed for such action.

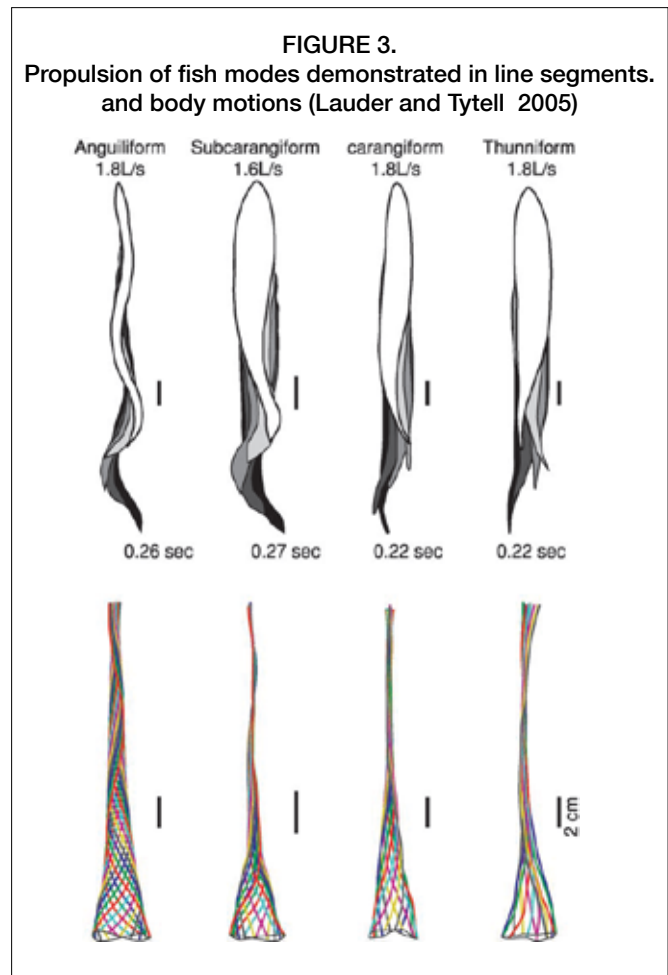
The evolutionary characteristics of motion of the fish in marine environments make it an ideal design to navigate the feed water system piping. The buoyance of the body keeps it aligned and straight within the fluid flow. The caudal fin generates thrust through a vortex motion that propels the fish forward. The stability of the fish's body comes from air pockets inside the fish to keep right side up; a similar approach will be used in the robotic version. However, the pectoral fins will not be included in the robotic version, as appendages will increase the drag and potential for snagging inside the pipe system.



LOCOMOTION

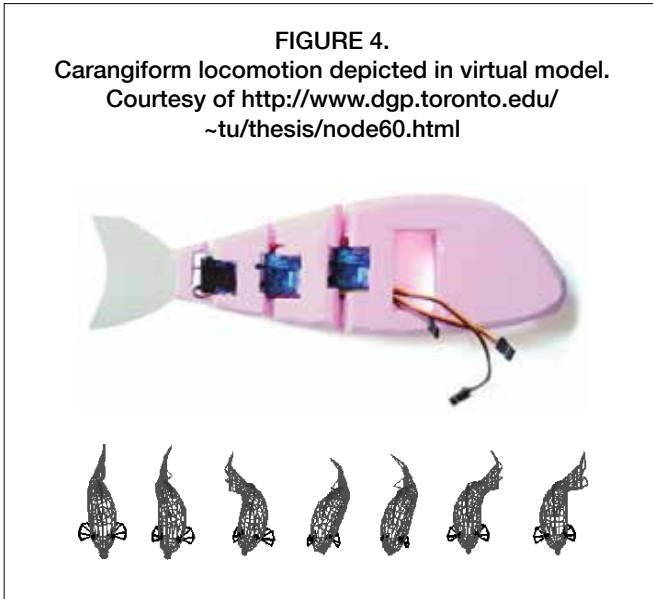
What separates the different styles of fish bodies is the caudal fin and locomotion style.

Fish are characterized by “modes” of swimming. The types include anguilliform, thunniform, carangiform, and subcarangiform. Examples of these movements are noted in eels for anguilliform, where large portions of the fish's body undulate during propulsion (Gray, 1933; Gillis, 1996). The thunniform is based on the tuna body. It has a high tail oscillation with little body movement (Donley and Dickson, 2000). Carangiform motion is between the anguilliform and thunniform modes, as the caudal fin moves as much as in the thunniform mode. The difference in the two modes is amplitude of the tail. In Figure 3, the propulsion of each mode can be seen more clearly. The carangiform motion can be noted as the best motion for the device, as the sensors require still placement for detection and location marking. Figure 3 demonstrates that the carangiform is the most effective in a volumetric flow rate of 1.8 liters per second based on a 2-inch long fish (Lauder & Tytell, 2005).



The carangiform motion is also depicted in the image below, a sway from the center to one extreme to the other. The image below depicts the motion in segments. It can be noted that the head of the fish stays centered to the motion. This area is the best location for the sensor devices.

FIGURE 4.
Carangiform locomotion depicted in virtual model.
Courtesy of <http://www.dgp.toronto.edu/~tu/thesis/node60.html>



The fish, its body being long and slender, is parted into segments that act in a chain reaction, each segment of the fish tail bending at an angle to produce a flip or flick similar to the carangiform mode. Figure 5 illustrates the partition of the body and the degree changes in chain order. By using servo motor controls at a delayed trigger, the motion will be mimicked.

Various types of other motion were considered, such as ionic polymer-metal composite, ball and piston actuation, chemical combustion of azide, and memory alloys. However, the best motion continued to be the use of servo motors to simulate the carangiform with the greatest torque and thrust to achieve dependable motion. The image below depicts a rough estimate of how the fish module would be modeled, the difference being within the body shape, as more oval thickness would replace the rigid shape of the pictured fish. Also, infrared sensors would be attached within the head.

PROTOTYPE COMPONENTS

Due to the small size of the device, an even smaller controller is required. The size of a microcontroller will have to be a few centimeters long. An ideal microcontroller would be the Adafruit Trinket Mini

FIGURE 5.
Illustrated into segments of fish body and angles to produce a carangiform motion.

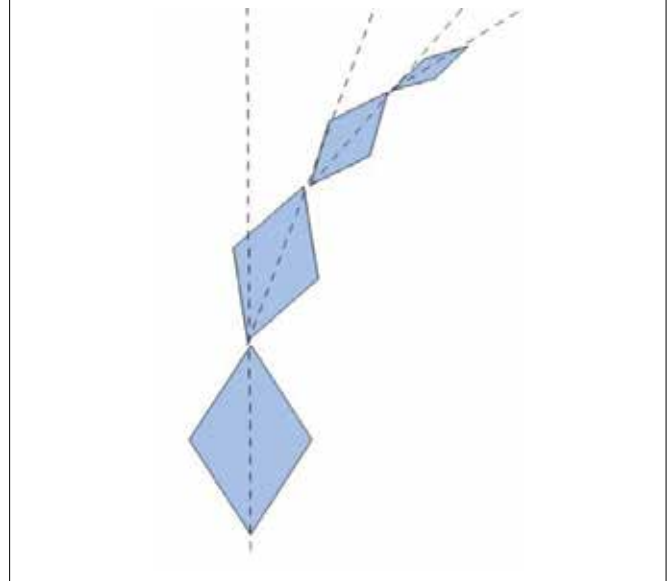
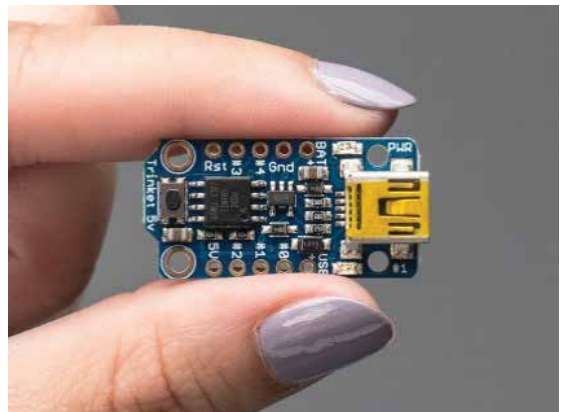
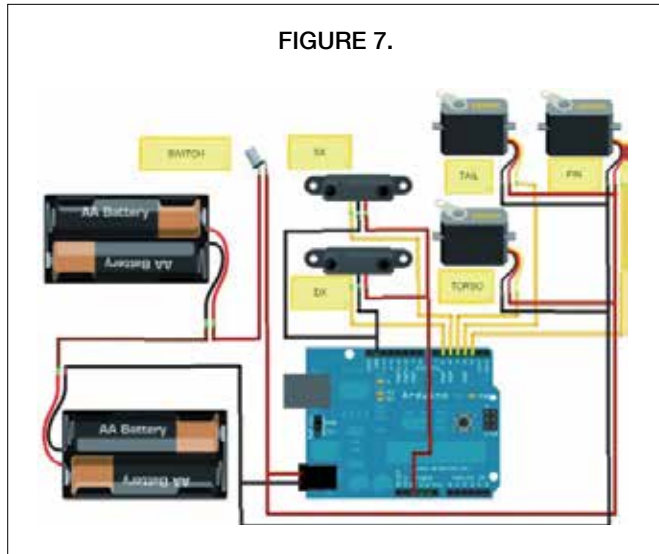


FIGURE 6.
Adafruit Trinket Mini size comparison to relative hand size.
Courtesy of <http://www.adafruit.com/products/1501>



Microcontroller with dimensions of 31mm x 15.5mm x 5mm. The projected formulation of the microcontroller and wiring inside the fish body is seen in the below image. This rough image shows how the components will fit together. At each break the caudal tail will be connected with a servo motor, run by an Adafruit Trinket.

The program **for** microcontroller will initiate movement through the tail. The servo motor will bend one section



of the tail at a time. The servo motor and tail pieces will coordinate to function smoothly to mimic the carangiform mode. Demonstration of how the wiring will be constructed is pictured in Figure 7. The servo motors will be lined along the caudal fin of the plastic body of the fish. Once timing has been perfected and forward motion is set, the next step is attaching sensors for thermal imaging capture. If thermal peaks are documented anywhere along the pipe or at connections, those areas should be of interest to the facility for further analysis, as these weakened points could cause further failures.

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DO PARENTS PICK MORE THAN A NAME? FIRST NAME PHONEMES AND PERSONALITY TRAITS

by CORREY D. MILLER

ABSTRACT

The purpose of this study was to explore possible connections between the phonemes in first names and personality characteristics. Participants (N = 50, 68% female, mean age = 23.4) completed an inventory assessing the Big Five personality traits. They were then video/audio recorded stating their first name. The phonemes comprising each name were identified using the International Phonetic Alphabet. T-tests were conducted to compare the personality traits of people whose names contained a certain phoneme vs. those whose names did not. People with the /n/ phoneme had lower scores on neuroticism (in particular, less depressive and immoderation traits) than people without this phoneme, and people with the /n/ phoneme had higher scores on neuroticism (particularly higher anxiety and vulnerability traits) than people without that phoneme. Future studies should replicate the study with a larger sample size.

MENTOR

Dr. Amy Houlihan

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Do Parents Pick More Than a Name?

Do parents pick more than just a name? Does the sound of a person's name have anything to do with the personality they develop? Previous research on names and personality have focused on characteristics attributed to a person by others on the basis of one's name or on the placement of specific letters in one's name, as well as how people feel about their names and the life outcomes and expectancies as bearers of that name. To date, no research has examined the phonetic qualities of a name (i.e., the specific sounds of a name) and their relation to personality characteristics, which was the goal of the current study.

The Five Factor theory, first proposed by McCrae and Costa (1985), maintains that personality is comprised of five basic dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. These Big Five characteristics have been the focus of personality research since its introduction and have been empirically validated with supporting research for nearly thirty years (Chang, Connelly, & Geeza, 2012).

Names and Interpersonal Impressions and Communication

Scientists have studied how names can affect personal outcomes in life and interpersonal communications with others. The name-based interpersonal neglect hypothesis states that negative names create negative interpersonal reactions, which influence people's life outcomes and experiences (Gebauer, Leary, & Neberich, 2011). This research showed that more people had interests in others with positively viewed names rather than culturally common names. They called this the "Kevinism effect," which is discrimination against people who have culturally devalued names due to them becoming common (Gebauer et al., 2011).

Names and Perceived Personality Characteristics of Others

Several studies have examined characteristics that others attribute to a bearer of a specific name. For example, people tend to attribute less ethical caring traits (e.g., trustworthiness, loyalty, sensitivity, and kindness) and more successful characteristics (e.g., intelligence, ambition, assertiveness, and creativity) to men's names than to women's names (Mehrabian, 2001). In addition, Laham, Koval, and Alter (2011) explored the phenomenon called "the name pronunciation effect," which states that people bearing names that are easier to pronounce in that culture are viewed more positively than people with names that are more difficult to pronounce. This is due to the fact that easy-to-pronounce sounds are processed more easily in the brain, according to the hedonic marking hypothesis, which states that processing fluency creates a positive state that is attributed to the easy-to-process stimuli (Laham et al., 2011). This has real world implications in that many higher-ranking partners in law firms have easier-to-pronounce names (Laham et al., 2011).

In another study, the perception of names based on previous experience with people bearing that name was studied. Ofek and Pratt (2008) examined responses to the name stimuli as measured by the Peripheral Arterial Tonus (PAT). The PAT shows an autonomic response to the stimulus name through electrodes placed on the body. These signals are sent by the autonomic system when the subject hears the name. The authors also created a questionnaire for quantifying the subjective significance of the name the person hears. The subjective significance of names was rated higher if the

subject knew and cared for someone bearing that name, if they had recently had an interaction with someone bearing that name, or had recently come into contact with someone bearing that stimulus name. The PAT also showed activation if the subject had a negative experience with a bearer of the same stimuli name (Ofek & Pratt, 2008). All of these studies measured the biases that people hold for names as a result of life experiences with others.

Names and Self-Reported Personality Characteristics

In contrast to measuring perceptions of others, additional research has examined the relation between one's self-reported personality characteristics and liking of personal names. One study (Joubert, 1999) aimed to identify how the liking of names is associated with the Big Five personality characteristics. Participants completed a personality inventory before they were asked to rate a preselected list of 60 male names and 60 female names. The list contained common, uncommon, dated, and rare names. The results showed that common names were preferred to less common, dated, and rare names; less common names were preferred over rare names, and overall, no one really liked rare names. Participants who scored higher in agreeableness and extroversion reported liking more personal names. Higher scores in both agreeableness and extroversion were associated with stronger preference for both common and less common names, but not for rare and dated names (Joubert, 1999). The current study expands upon this research by measuring 30 different personality characteristics of each participant, allowing for a more detailed analysis of personality.

The study that is most similar to the current research, by Marlar and Joubert (2002), measured the liking of participants' own personal first and middle names and how it related to self-esteem as well as the Big Five personality characteristics. This study discovered that the liking of one's own first name is positively correlated with conscientiousness. In addition, it showed that self-esteem was positively correlated with scores on agreeableness, conscientiousness, and extroversion and negatively correlated with neuroticism (Marlar & Joubert, 2002).

One of the more unique forms of analyzing names and personality characteristics, called Neimology (Wyeth,

2012), predicts personality characteristics solely by where the letters fall in a name. According to Neimology, the placement of each letter is crucial to specific traits, and each vowel also has its own characteristics associated with it depending on where it falls in a name (Wyeth, 2012). For example, if the first vowel in a name is an 'a' then the person with that first vowel is likely to want people to be honest with them, value justice and wisdom, and be fairly self-reliant (Wyeth, 2012). However, there is not currently any empirical data to support this theory. Rather than examining the letters of names, the current study focused on the phonemes that comprise each name. In other words, it examined the actual articulation of the sounds that make up the name and their relation to self-reported personality traits. In addition, participants in the current study were not asked to report their legal name but whatever name their parent/guardian called them most often. Thus, some participants' phonemes were selected from a nickname or family name.

Phonetics is the scientific study of the sounds of language, not the rules or grammar of the language. Phonetics deals just with the sounds themselves, and identifies the sounds using the International Phonetic Alphabet (IPA). The IPA is a comprehensive set of symbols that allows for transcription of the sounds of all the languages of the world by differentiating the sounds based on the physiology used to create the sounds. These individual and unique sounds are called phonemes.

Summary and Rationale for the Current Study

Several studies have explored associations between names and perceived personality traits of others as well as self-reported personality traits. People make inferences about others' personalities based on their names (Meharbian, 2001). People with higher scores on agreeableness and extraversion tend to report greater liking of names (Joubert, 1999), and liking one's own first and middle names correlates with conscientiousness (Marlar & Joubert, 2002). To date, no research has investigated any relationship between personality and the phonemes of a person's name. Although Wyeth's method for identifying personality characteristics is lacking empirical support, her book comes relatively close to seeking to identify what the current study is suggesting. No one has yet studied any

relationships between personality and the phonemes of each person's name. The current study aimed to identify any personality characteristics that may be associated with specific phonemes of the names that participants report being referred to by their parents/guardians.

METHOD

Participants

Participants were students enrolled at Texas A&M University-Corpus Christi (TAMUCC). The study consisted of 16 male and 34 female participants whose ages ranged from 18-53 years old (M age = 23.4). The ethnic composition of the sample was: 45% Caucasian/White, 38.3% Hispanic/Latino, 6.6% African American/Black, 3.3% Asian/Asian American, 5% American Indian/Alaskan Native, and 1.1% Other.

Procedure

Potential participants were informed about the current study by the researcher who made announcements in classes. Students who were interested in participating were asked to provide their contact information. The researcher later contacted each participant with instructions about the date, time, and location of the study.

Upon arrival, participants were asked to read and sign an informed consent form indicating their consent to participate as well as certifying that they are both students of TAMUCC and at least 18 years of age. Students were then given a questionnaire containing demographic information and a personality inventory. Students were given as much time as needed in a conference room to rate how well 120 statements described them. Students were instructed to ask for clarification on any statements that they did not understand and to skip any statements that they did not wish to answer.

When the personality inventory was completed, students then began the second part of the study. They were asked to walk with the researcher next door and instructed to read the following sentence: "Hi, my name is (FIRST NAME) , and I am a student at Texas A&M University-Corpus Christi." while being video and audio recorded. The recording provided accurate and proper pronunciations and articulation of the participants' names. After the recording was finished,

the participants were thanked for their participation and were free to leave the lab.

Measures

Demographic characteristics. Subjects were asked to identify their ethnic identity from the following categories: Caucasian/White, Hispanic/Latino, African American/Black, Asian/Asian American, Native Hawaiian/ Pacific Islander, American Indian/ Alaskan Native, or Other and then asked to specify. They were also asked to indicate the language their parents spoke when the participants were growing up. Lastly, participants were asked to report their age and gender.

First name. Participants were asked to print the name they were most often referred to by their parent(s)/ guardian(s) during childhood and adolescence.

Personality inventory. Johnson's (2011) "The Items in Each of the 4-Item IPIP Scales Measuring Constructs Similar to Those in the 30 NEO-PI-R Facet Scales" was used to assess participants' personality traits. This inventory includes 120 statements that are indicative of 30 separate personality traits. For each item, participants rated the extent to which the statement described them on the following scale: 1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, 5 = strongly agree. The 30 traits are: anxiety ($\alpha = .81$), anger ($\alpha = .83$), depression ($\alpha = .71$), self-confidence ($\alpha = .79$), immoderation ($\alpha = .75$), vulnerability ($\alpha = .82$), friendliness ($\alpha = .80$), gregariousness ($\alpha = .80$), assertiveness ($\alpha = .82$), activity level ($\alpha = .69$), excitement seeking ($\alpha = .82$), cheerfulness ($\alpha = .85$), imagination ($\alpha = .86$), artistic interests ($\alpha = .64$), emotionality ($\alpha = .83$), adventurousness ($\alpha = .60$), intellect ($\alpha = .75$), liberalism ($\alpha = .70$), trust ($\alpha = .88$), morality ($\alpha = .76$), altruism ($\alpha = .75$), cooperation ($\alpha = .83$), modesty ($\alpha = .83$), sympathy ($\alpha = .77$), self-efficacy ($\alpha = .87$), orderliness ($\alpha = .85$), dutifulness ($\alpha = .17$), achievement striving ($\alpha = .68$), self-discipline ($\alpha = .78$), and cautiousness ($\alpha = .90$).

The thirty personality traits are derivatives of the Big Five personality traits. Neuroticism is the combination of anxiety, depression, anger, self-consciousness, immoderation, and vulnerability ($\alpha = .89$). Extraversion is the combination of friendliness, gregariousness, assertiveness, activity level, excitement-seeking tendencies, and cheerfulness ($\alpha = .89$). Openness is the combination of imagination, artistic interests,

emotionality, adventurousness, intellect, and liberalism ($\alpha = .80$). Agreeableness is the compilation of trust, morality, altruism, cooperation, modesty, and sympathy ($\alpha = .80$). Conscientiousness includes self-efficacy, orderliness, achievement striving, self-discipline and cautiousness ($\alpha = .90$). Dutifulness is also included in this group, but it was omitted from the analyses in the current study due to poor reliability ($\alpha = .17$).

Phonetic Assessment. Each participant was video recorded by the researcher saying his/her own name in a sentence to help avoid cultural language and speech patterns biases. Names were then analyzed and broken down into their phonetic phonemes using the International Phonetic Alphabet (IPA). A complete list of all the phonemes present in the participants' names was compiled, and every participant was coded on the presence of these phonemes (1 = phoneme present, 0 = phoneme absent). Only the top 11 most common phonemes were included in the data analysis (see Table 2 for phonemes).

RESULTS

Descriptive Statistics

Table 1 contains the 30 personality characteristics with the mean scores, standard deviation, and the range of scores.

T-tests

Eleven phonemes were identified as having the highest reported frequencies (see Table 2). For each of the 11 phonemes, t-tests were conducted to compare each of the Big Five personality scores between people whose name contained the given phoneme and those whose name did not. In general, personality scores did not significantly differ between participants who had certain phonemes and those who did not ($p > .07$). However, participants whose name contained the /n/ phoneme scored lower on neuroticism than those who did not ($t(48) = -2.25, p = .029$). In addition, people whose names contained the /n/ phoneme scored higher on neuroticism than those whose did not ($t(48) = 3.061, p = .004$).

To further explore these differences, we conducted t-tests using the facets that comprise neuroticism (anxiety, anger, depression, self-confidence, immoderation, vulnerability). For the /n/ phoneme, people whose name contained the phoneme scored significantly lower on

depression ($t(48) = 2.40, p = .020$) and immoderation ($t(48) = 2.63, p = .012$) compared to those whose name did not. For the /n/ phoneme, people whose name contained the phoneme scored significantly higher on anxiety ($t(48) = -3.38, p = .001$) and vulnerability ($t(48) = -4.061, p = .001$).

DISCUSSION

The purpose of the current study was to determine any relationship between the sounds of a name and personality characteristics. This study suggests that the phonemes /n/ (e.g., Nickel) and /ə/ (e.g., Appointment) are associated with neuroticism. Neuroticism includes sub-facets involving negative affective states (e.g., anxiety, depression, anger) as well as emotional instability (e.g., immoderation, vulnerability). It should be noted that any relationship between phonemes and personality characteristics does not indicate that having a certain phoneme causes a person to develop a certain personality trait. For example, a person may have a greater predisposition towards neuroticism not due solely to the sounds of his name, but because he has parents who have neurotic traits.

Limitations

The biggest limitation of the current study was the small sample size. With a relatively small number of names collected, there were not enough cases of certain phonemes to conduct the analyses. Therefore, it remains unknown whether those phonemes are associated with any particular personality traits. Furthermore, the study may have lacked power to detect differences even among the phonemes that were analyzed. In addition, the sample was comprised of primarily Hispanic and Caucasian young adults, limiting the variability of the phonemes present in the names collected.

Future Directions

To expand on the current data, future studies should replicate the study with a larger sample of more demographically diverse participants to tap into a broader array of names and phonemes. With an increased sample size, not only would the phonemes present most likely expand, but also the most common phoneme(s) may also change. These sample names would be influenced by cultures, which could suggest that the relationship between phonemes and distinct cultures may also need to be analyzed once the

phonemes and personality characteristics are examined. This data from a larger future sample may indicate a non-culturally/language defined pattern present due to sound integration and pairing with word meanings. If a relationship is present, future longitudinal studies may be able to determine if (and how) phonemes influence personality development and acquisition in children from the time they are infants. This would require frequent data collection and the analysis of parents' personalities and cultural influences.

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TABLE 1.
Personality facets, means,
standard deviations, and ranges

Personality facets	M	SD	Range
<i>Neuroticism</i>			
Anxiety	3.02	0.93	1.00 - 5.00
Anger	2.56	0.95	1.00 - 4.25
Depression	2.05	0.78	1.00 - 5.00
Self-Consciousness	2.70	1.05	1.00 - 4.75
Immoderation	2.84	0.94	1.00 - 5.00
Vulnerability	2.47	1.01	1.00 - 4.75
<i>Extraversion</i>			
Friendliness	3.78	0.85	1.75 - 5.00
Gregariousness	3.27	1.00	1.00 - 5.00
Assertiveness	3.83	0.84	2.00 - 5.00
Activity level	3.12	0.84	1.25 - 4.75
Excitement-seeking	3.49	1.01	1.75 - 5.00
Cheerfulness	4.10	0.82	2.00 - 5.00
<i>Openness</i>			
Imagination	3.90	0.95	1.50 - 5.00
Artistic interests	3.61	0.89	1.25 - 5.00
Emotionality	3.98	0.84	1.75 - 5.00
Adventurousness	3.08	0.74	1.00 - 4.50
Intellect	3.56	0.82	1.75 - 5.00
Liberalism	2.90	0.87	1.00 - 4.50
<i>Agreeableness</i>			
Trust	3.39	0.91	1.00 - 5.00
Morality	4.52	0.56	3.00 - 5.00
Altruism	4.42	0.60	2.75 - 5.00
Cooperation	3.95	1.00	1.00 - 5.00
Modesty	3.34	0.94	1.25 - 5.00
Sympathy	3.88	0.77	2.50 - 5.00
<i>Conscientiousness</i>			
Self-efficacy	4.26	0.64	2.75 - 5.00
Orderliness	3.38	1.14	2.50 - 5.00
Dutifulness	4.27	0.43	3.25 - 5.00
Achievement-striving	4.12	0.75	1.75 - 5.00
Self-discipline	3.72	0.87	1.50 - 5.00
Cautiousness	3.58	1.07	1.00 - 5.00

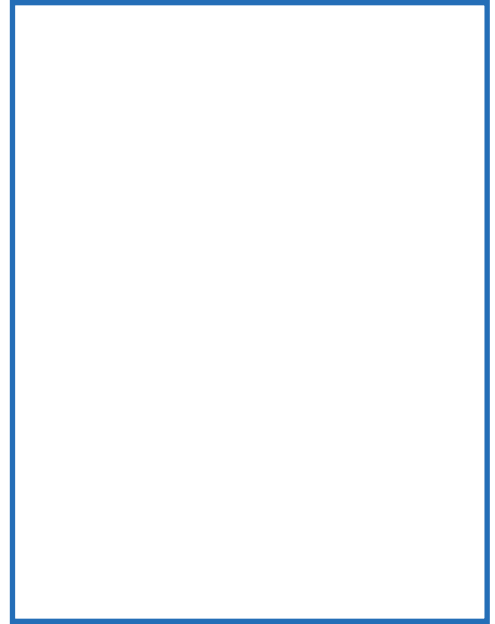
TABLE 2.
IPA usage, example words containing
the phoneme, and frequencies of the 11 phonemes
included in the current analyses

Phoneme	IPA usage	Example word	Frequency
/n/	Voiced dental or alveolar nasal	“ <i>Need</i> ”	24
/i/	Close front unrounded vowel	“ <i>marrY</i> ”	14
/I/	Transitional cardinal vowel	“ <i>Introduction</i> ”	14
/ə/	Mid central unrounded vowel	“ <i>Assembly</i> ”	13
/k/	Voiceless velar stop	“ <i>Caught</i> ”	18
/t/	Voiceless alveolar or dental plosive	“ <i>Tennis</i> ”	14
/ɹ/	Voiced alveolar or post alveolar approximant	“ <i>aRts</i> ”	12
/s/	Voiceless alveolar median fricative	“ <i>Swimming</i> ”	12
/l/	Voiced alveolar lateral approximant	“ <i>Less</i> ”	9
/æ/	Not fully open unrounded vowel	“ <i>Alias</i> ”	8
/m/	Voiced bilabial nasal	“ <i>Mummy</i> ”	8

NOTE: Phoneme sounds are illustrated by the italicized letter in the example word.

JOHN EMBREE'S TRANSPACIFIC CAREER: SOCIAL SCIENCE, SUYE MURA, AND THE WAR RELOCATION AUTHORITY, 1936-1946

by ARTHUR OADEN



John Embree, an anthropologist from the Chicago School of anthropology, played an important role in shaping American cultural understanding of Japan both before and after World War II. In 1936, he and his wife Ella Lury Wiswell engaged in a yearlong study of Suye Mura, a Japanese agricultural village. His work in Suye Mura involved extensive contact with Japanese sociologists and anthropologists, and established him as a Japan expert. During World War II, his career took a significant turn when his expertise and knowledge of Japanese culture came to the attention of the War Relocation Authority (WRA), the agency created by the United States government to supervise the internment and relocation of Japanese Americans from 1942 to 1946. Despite the significance of Embree's work to the

WRA, Embree deemphasized this part of his career and maintained the focus on Japanese culture that had defined his career from its start in Suye Mura. This article examines the nature of Embree's work, compares it to the work of other anthropologists in the internment camps during World War II, and analyzes Embree's approach to his career and his relationship to the WRA.

Japan and the United States had many interactions and intersections in the first half of the twentieth century. One significant period was the period from the 1930's until the late 1940's and the start of the Allied Occupation of Japan after World War II. During this time American policymakers and intellectuals were in the process of trying to understand and study Asian cultures, and Japanese immigrants and Japanese Americans became the subjects of their study. One area where Japanese and United States history intersected can be found in the work of John Embree, a prominent anthropologist and Japan expert in the mid-twentieth century.

Embree's work was important for both his early anthropological research on Japanese culture and society in the 1930's and also because of his later work studying the internment of Japanese Americans in the United States during World War II. In 1942, President Franklin Delano Roosevelt issued Executive Order 9066, which initiated the forced relocation of Japanese

MENTOR Dr. Michael Jin

Assistant Professor
Department of Humanities
College of Liberal Arts

Americans living along the West Coast. The internment of Japanese Americans, the majority of whom were United States citizens by birth, was a reaction to the perceived threat from those of Japanese ancestry. What began as a relocation order without plans for the long-term incarceration of Japanese Americans soon transformed into a large-scale project that involved incarcerating, regulating, and analyzing the lives of thousands of Japanese immigrants and American citizens that continued until the end of the internment in 1946.

The "Relocation Centers" were operated by the War Relocation Authority (WRA), the government agency that was organized to operate the 10 internment camps. The WRA created a division called the Community Analysis Section (CAS) to study the culture and behavior of Japanese Americans in the camps. John Embree became involved when he was hired by the WRA to work in the CAS because of the knowledge and expertise in Japanese culture he had attained in the course of his research and training and the WRA's interest in the unique perspective he could bring on Japanese immigrants to the United States. Although Embree's career and training was primarily focused on Japan and Japanese culture, the WRA asked him to provide anthropological expertise on Japanese Americans, a part of his career that Embree does not mention in his later work despite its significance. Embree's background was very different from that of other anthropologists who studied the internment, most of whom did not have the same level of experience studying Japanese culture. This study examines the relationship of John Embree's study of Japanese culture to his work in the internment camps by showing how Embree's career offers insight into the work of social scientists in the creation of wartime policy and how early twentieth-century social science was used by the War Relocation Authority to manage the internment of Japanese Americans during World War II.

After finishing his undergraduate education, John Embree pursued graduate study in anthropology at the University of Chicago, and in 1935, he obtained funding to pursue anthropological study in rural Japan as part of his doctoral thesis.¹ Embree and his wife, Ella Lury Wiswell, moved to the rural village of *Suye Mura* in northern Kyushu and made many observations of

daily life in that village. These observations were the basis for his book *Suye Mura*, which was published in 1939 and became a significant source of information on Japanese culture and society.

Embree's work is situated in the context of several significant intellectual currents of the 1930's. The first was the development of the Chicago School of Sociology, and its emphasis on the direct observation of people from cultural backgrounds different from that of the researcher, a theory that influenced contemporary anthropology. Henry Yu argues that this put a greater emphasis on analyzing mundane aspects of everyday cultural practices.² Anthropologists of the Chicago School considered this a way of gaining greater knowledge and understanding of daily life as a means of better understanding culture. This approach clearly influenced John Embree's work in *Suye Mura*, as he devoted attention to many areas of daily life, particularly word usage and terminology.³

Another influence on Embree was the anthropological work conducted in East Asia during and prior to his 1936 study. Before and after his work in *Suye Mura*, Embree requested advice and information from Japanese anthropologists. Akitoshi Shimizu analyzes and discusses the work of prewar and wartime Japanese anthropologists, and also discusses the work of American anthropologists including John Embree in his discussion of anthropology and its influence on the General Headquarters of the Allied Powers during the Occupation of Japan. Japanese anthropological work was mainly directed towards colonial subjects in territories such as Taiwan and Korea. Shimizu argues that Japanese anthropological approaches towards populations in Taiwan and Korea were different in character and led to different methods and approaches.⁴ Shimizu argues that anthropologists studying Taiwan most commonly focused on the study of non-Chinese populations from aboriginal tribes, while anthropologists in Korea had almost no access to any minority populations and instead focused on mainstream Korean populations. Shimizu suggests that this is a result of Japanese anthropology of the time being less advanced and therefore less prepared to study more complex societies.

Embree's consultation with Japanese social scientists when he was in the process of preparing for research in

Japan and also during preparation for the publication of *Suye Mura* would have given him some Japanese influence on his research. Analysis of Embree's work by Japanese anthropologists suggested there were limitations on his work given the conditions present in the late 1930's. His description of Suye Mura showed a village with norms separate from those of Japanese urban culture and society despite the influence of schools and the military upon society.⁵ Suzuki Eitaro, a Japanese sociologist who analyzed rural society, critiqued this as being an artifact of the village being more "old fashioned" than a typical Japanese village, but he did admire the research conducted and believed it showed a good methodology for the study of society and culture.⁶ Suzuki, like other Japanese authorities, found the research much more questionable before he saw the final status of his work and had originally argued against carrying out the study of Suye Mura when consulted earlier. Embree's communication with Suzuki was only part of his consultation with Japanese anthropologists. This effort was not just an important part of his research as an anthropology student but also cemented his position as a specialist in the study of Japanese culture and society.

Embree was hired by the Community Analysis Section of the War Relocation Authority in 1942 to provide his insights and help mitigate the problems related to the forced evacuation and resettlement of Japanese Americans. Embree's work in the internment camps was very different from his research in Suye Mura, and the responsibilities, influences, and procedures were much less academic. Many historians have studied the circumstances of the internment camps, particularly Alice Yang Murray. Her analysis discusses the various perspectives on the internment, and the role of researchers in the internment camps. One viewpoint that had to be taken into consideration was that of the internees themselves. In order to accommodate their attitudes and preempt possible feelings of inferiority, all anthropologists involved in the camps were called sociologists, to avoid implying that the Japanese Americans in the camps were being treated as if they were a "primitive people," the typical site of anthropological study at the time in the mind of the public.⁷ Additionally, not all of the anthropologists involved were employed by the War Relocation Authority, meaning that there

were conflicting perspectives on the use of social scientific research within the camps. Murray analyzes the role of the researchers involved in the camps, describes the work and actions of the Community Analysis Section, and compares its work to that of the Japanese Evacuation and Resettlement Study (JERS), an academic project to study the internment created by the University of California, Los Angeles.⁸ Rosalie Hankey Wax was one of the researchers employed by the JERS. This affected the conditions of the research because members of the JERS such as Wax were warned not to share data with members and staff of the WRA to avoid jeopardizing sources or corrupting research, as any leak of information could lead to potentially negative repercussions for the internees.⁹ She points out the relative freedom the JERS researchers had as non-governmental employees, who were better positioned to openly challenge government abuses. Members of the CAS also tried to assist internees, but had to work much more quietly.

One question to be answered is how deeply Embree's earlier work influenced the War Relocation Authority. Many aspects of Embree's work in the internment camps would have been drawn primarily from his graduate training in the Chicago School despite the government's interest in his work in Suye Mura and knowledge of Japan. His analysis of the village was situated in the context of an agricultural community whose people had settled there for years or had voluntarily relocated, in contrast to the internment camps which had been created deliberately by the government and had involved forcible relocation. Although he potentially had a more accurate perspective on Japan than other researchers in the camps, this perspective on Japan provided a narrower window than might be desired given the task.

Suye Mura

Embree's work in the village of Suye Mura would have given him a much more limited exposure to many of the more educated upper and middle-class people he encountered in the camps, including Japanese Americans who had lived and studied in Japan, some of whom were graduates from Tokyo Imperial University and other major Japanese academic institutions. Despite these potential limitations, his research allowed him and others to better understand the circumstances and

attitudes of Japanese nationals and Japanese Americans in the internment camps during the Second World War. His knowledge of Japanese culture allowed him to determine that the majority of those detained in the internment camps demonstrated a primarily American cultural orientation, and that this was widespread among those incarcerated even among groups that would generally have been considered less loyal.

Although Embree's work in Suye Mura allowed him to observe Japanese attitudes towards nationalist ideology and militarism, **these** were not the main purposes of his work in that village. It was instead directed at obtaining an overall understanding of Japanese village culture. However, it was those specific features of Japanese culture that became significant to his work in 1942, when he began work with the CAS and was tasked with the duty of observing these cultural features among Japanese Americans. Embree made many observations during his work in the internment camps, and he made it very clear that many of the people he was working with were not Japanese in cultural orientation according to his observations, including many who were *Issei*, or first generation Japanese immigrants, and *Kibei*, second generation Japanese Americans who had studied and lived in Japan.¹⁰ Embree's description of internee attitudes towards Japan and the United States shows they were heavily influenced by attitudes towards the internment itself and varied from day to day, rather than being predetermined by their general background.

Embree began conducting and completing his research on Japanese culture in Suye Mura in 1936. Daily life in Suye Mura was heavily influenced by state power, but not to the same extent as life in the internment camps. The village had been there for generations, and the villagers were in many respects more aligned with settled routines of life and their familial and interpersonal obligations than with the interests of the government. The state interceded only as a product of modernization, and its influence in Suye Mura was still limited in comparison to other parts of Japan. The internment camps, on the other hand, were entirely the product of the United States government's decision to relocate Japanese expatriates, immigrants and Japanese Americans in response to a perceived threat along the West Coast.

The premise of John Embree's study of Suye Mura was that the village was not artificial or an outlier, but it was nevertheless a unique area of study. The area is very mountainous, meaning it was more isolated than villages along coastal plains. Only in the decades before the study were increasing connections being made to the outside world. Several observations of Japanese culture were made as a result of his work in this village, and they showed the influence of state power on contemporary aspects of Japanese culture, the importance of government education, and also aspects of local culture that contradicted state-directed cultural tendencies that were in progress at that time.

Analysis of Suye Mura differed between Embree and his **wife Wiswell** as a result of the very different perspectives involved. Embree worked primarily through a translator and interpreter and did not have as extensive a set of connections with the women of the village as Wiswell. Additionally, Embree's interpreter was a man who had grown up in an urban setting rather than a farming village.¹¹ The interpreter was not comfortable with the sexual and social attitudes of many of the farmers, giving Embree a limited window into many of these affairs. Although this would have limited his ability to understand home life, the areas of nationalism and militarism were much more easily exposed to study.

Embree's work in Suye Mura shows he had a minimal exposure to the worst aspects of Japanese militarism, only noting its influence in daily life through state organs such as school and military drills, as well as the Army Reserve Organization. He also encountered very little xenophobia or hatred of Americans. Wiswell recounted only one incident that occurred when dealing with a soldier returning from Manchuria.¹² Nevertheless, he could see how government power and the work of the most educated middle-class professionals in Japan were serving to encourage reverence for the military and expand its importance throughout the community. The school system was a critical part of this and was the main source that spread these attitudes among the children and young people of the village. The school system also helped encourage support for expansion of the Japanese Empire through the use of maps and a rhetoric focused on Japan's limited natural resources. Other organizations that supported the increased prominence of the military and the government included

the Reservists associations as well as organizations like the Women's Patriotic Association.

Embree and Wiswell's analysis of Suye Mura showed the village to be primarily preoccupied with domestic concerns and still resistant on many levels to the various attempts to impose social change from a top-down approach. Suye Mura both adopted and resisted attempts by middle-class reformers and the state to observe and control daily life in that village. Both tendencies towards social reform and sexual restraint as well as support for nationalism and militarism came primarily from the schoolteachers of the village.

Embree noted many differences in social attitudes between schoolteachers and the rest of the village, the majority of whom were farmers. These differences point to the wide gulfs between farmers such as those in Suye Mura and other sectors of Japanese culture. The school's operation served to integrate Suye Mura and seemed to have had some success among younger people in the community, whose attitudes towards sex were much more reticent than in the past as can be seen by the decline of the Bon dance, a sexually charged dance traditionally conducted during the Bon season in summer.¹³

The school system was a central place in which the Japanese state attempted to bring children as well adult males and women into roles that were approved by the state. This can be seen in Embree and Wiswell's work in Suye Mura. Embree notes that nearly all organizations that aimed to assist women or encourage patriotic behavior, such as the *aikokufujinkai*, or Women's Patriotic Association, as well as the Buddhist association, were led by men. Women were largely not enthusiastic leaders in them, despite attending and participating in events.¹⁴ Women generally preferred to focus on domestic affairs in all senses of the word, as Wiswell observed. It was difficult for Embree or Wiswell to perceive significant female action in public affairs, particularly in organizations that involved the propagation of a nationalist worldview. Exceptions occurred when those organizations' activities intersected with the daily affairs of life, but they only served to give an official status to activities that were already being conducted independently of any governmental support, as Wiswell pointed out.¹⁵ Examples are the support for women's

work in community activities and the organization of official fire brigades which differed little from traditional civic actions undertaken by volunteers to put out fires.¹⁶ Despite these limitations, the local school principal who was the head of the *fujinkai* was also the head of a second organization called the *kokubofujinkai* or National Defense Women's Association which was founded as an attempt to promote women's support for soldiers and national defense. Another area where state power showed limitations was in the creation of the *Seinendan* and *Seinen Gakko*, Young Peoples Association and Young Peoples School, respectively. Both organizations did their best to provide extended education as well as military drill, but still had to fit the agricultural labor cycle which limited the time young people had for education.¹⁷

Embree and Wiswell both understood the tendencies toward nationalism as almost exclusively originating in the Japanese state as well as middle-class functionaries. He makes the point that all of the women's organizations were led by men, mainly by schoolteachers who wanted to see greater social reform.¹⁸ Additionally, Wiswell's analysis of the work dealing with women's society and its activities shows that even something as basic as the purchase of uniforms was a potentially difficult decision given the lack of funding.¹⁹

Embree's work primarily focused on the community as a whole and the work of the education system. His emphasis on aspects of language such as the terms for the principle grains, rice and barley, shows the influence of the Chicago School emphasis on daily life.²⁰ The rest of the document also shows a devotion to this approach, with extensive analysis of family life. Wiswell also had a similar background in anthropology, but her knowledge of Japanese allowed her to better interact with others without the need for an interpreter, and her sex gave her a closer relationships with the women of the village than Embree could have provided. This meant she could more easily see women's reasons for nonparticipation in state-building activities, such as the lack of time involved when one must devote oneself to agricultural labor and the management of the home.

One overriding aspect of Suye Mura's culture that Embree noted was its lack of individualism, which he considered the only disability that truly limited

a person's ability to participate in village life. When considering the relationship between Embree's work with Wiswell in Suye Mura and his work in the CAS, it is interesting to note a brief statement he made on the character of Japanese emigrants who moved to the United States, suggesting that the majority were among those individualist misfits who could not fit into village life. This gives an insight into his basic assumptions regarding Japanese American immigrants, who he could easily view as more susceptible to assimilation into American culture on average than the typical immigrant to the United States. After the start of World War II, Embree's work as an anthropologist came to the attention of the War Relocation Authority, as the administration could determine that he might have the background necessary to show that the Japanese American immigrants were not a threat to the United States or American culture.

Work and Research during the Internment

Embree's work is not commonly mentioned in the works and memoirs of those who worked in the centers, including the official publications of the WRA or the memoirs of its director, Dillon Myer. However, his work was clearly valued by Myer, who requested that all WRA staff read Embree's report *Dealing with Japanese Americans* in a note made when distributing it in October 1942.²¹ The WRA had a clear need for expertise that could help them find a strategy to manage the camps and return the internees back into American society while mitigating prejudice against them. WRA publications repeatedly objected to prejudice against Japanese Americans, and demonstrated examples of Nisei loyalty and patriotism.²² Additionally, Director Dillon Myer wanted to use the internment as an opportunity to encourage the internees to assimilate into mainstream American society as part of a paternalistic desire to improve the lives of Japanese Americans. Myer spearheaded this approach as director of the WRA, and understood that Embree could serve an important role both because of his reputation and his knowledge.

Embree worked to analyze the culture of the internment camps as well as the attitudes of the internees as part of his duties. These areas have some clear overlap with the world of academic study that he came from. Other aspects of his work are more clearly distinct. Embree's

work as an employee of the WRA meant he was not only an advisor to those who operated the camps, but was also called to discuss detailed policy matters as well. His analysis of the net manufacturing project at the Poston War Relocation Center in Arizona is particularly revealing in the depth to which he goes into the logistical ramifications and morale issues involved in running an industrial operation in a camp. He suggested that running an industrial operation in a camp with a limited number of men was not advisable, as a community of this size would require men to deal with local maintenance operations as well as mess halls and other domestic affairs.²³ This broad analysis of practical camp management shows that Embree was in a position very different from the typical academic social scientist, as he was clearly tasked with identifying and solving practical problems rather than solely analyzing cultural and social affairs. It is clear that Embree's wartime duties extended beyond anthropology despite the limited expertise he would have had in policy making prior to this work. There is very little obvious prior experience with this work, except in his observations and sponsorship of public works in Suye Mura, making this an area where a parallel between his work in Suye Mura and his work in the WRA can be found.²⁴

There were many other anthropologists who worked in the internment camps. One other anthropologist who provides an important contrast to John Embree is Rosalie Hankey Wax, a researcher who served as part of the JERS study. As an employee of the WRA, John Embree, in contrast to others such as Wax, was assigned only to report on the camps to the government, and all of his analysis was directed towards and constrained by these circumstances. He gave administrative advice and also was assigned to describe and analyze the culture of the people in the camps, including their problems and concerns and their basic attitudes towards the United States and Japan. In contrast, Wax's work had a primarily academic focus. Her only assigned duties were observation of culture and attitudes, and she was limited in the amount of information she exchanged with the government. In some respects, Wax's work would have been closer to Embree's earlier work in Suye Mura in some ways. She, like Embree in Suye Mura, was engaged in academic work rather than service as an advisor in a government agency. Much like Embree

in Japan, she had to operate within the restrictions and limitations imposed by perceived military need without being a government employee.

Wax had to carefully interact with the authorities in the camps during her work, as did her supervisor, Dorothy Thomas. There was always some tension between JERS and the WRA.²⁵ Many of those in the military and the WRA were suspicious of having researchers there who would not be useful to the work of the government. Wax entered the camps while a graduate student in anthropology.²⁶ She found the process of conducting research in the camp very difficult given the unfamiliarity of fieldwork and its attendant difficulties. The highlight of her work was her observations of Japanese nationals and Japanese Americans in the Tule Lake camp in Northern California, most of whom eventually asked for repatriation to Japan at the end of the war, an exception compared to other internment camps.²⁷ However, the focus of her article "Twelve Years Later" is primarily on her work at the Gila Center, a camp with a more average population of Japanese Americans.²⁸ Wax encountered several problems, such as the difficulty of finding a place to conduct conversations with evacuees given the restrictions authorities placed on her and **the distrust of internees.**

Wax's public face regarding her work in the internment camps was quite confident, and in "Twelve Years Later" she shows every indication of absolute confidence in her work, an attitude she later softened in her book *Doing Field Work: Warnings and Advice*. She was new to fieldwork, and had to make many methodological changes to her approach while at the camp. She had no access to any interpreters, and had to learn Japanese while at the camp.²⁹ This afforded her an opportunity to gain the trust of the internees she spoke to, allowing her to display her own language difficulties and gain a rapport.³⁰ Wax's work shows a much greater focus on the methodology behind research than Embree's work, who directed almost every aspect of his work to discussing the culture being studied.

Embree's main task as an anthropologist was still largely focused on analysis of culture, and his observations aligned with those of Wax. He understood that attitudes towards the confinement varied from day to day, and were not caused solely by a preexisting American or

Japanese cultural orientation or loyalty, as Wax observed as well.^{31 32} Embree noted the rumors that circulated amongst internees, and also noted the persistence within the camp guards and administration of the prejudices that placed Japanese American families in these camps, such as accusations of sabotage shouted by a guard at the Poston camp.^{33 34} Dillon Myer, researchers like Embree, and others knew that there was a definite need to reign in these problems if the goals of the WRA were to be accomplished.

Embree never stated his attitude towards internment outright, but it is obvious that he, like many others, was uncomfortable with any tendency to automatically group Japanese Americans together with enemy aliens, as he could recognize the clear cultural differences involved. However, he betrayed no clear political or moral stand regarding the internment order in his writing while part of the WRA or in his work on Japan afterwards.

In addition to his research in the camps, Embree's wartime work included completion of his study of Japanese culture, *The Japanese Nation*, which was published in 1945. This book covered a much broader range of topics than *Suye Mura*, and analyzed many areas from family life to politics. Some of these are areas covered in *Suye Mura*, in other cases he **went much more in depth.** One significant difference was that this was not a case study, and instead served as a reference. He drew on many sources beyond his own work in Japan that allowed him to analyze aspects such as political activism and government, areas which he could not cover in *Suye Mura*. He clearly emphasized a need for an objective study of Japanese culture based on observations of the country itself.³⁵ He discussed the diverse racial origins of the present-day Japanese population, an issue important to his work in the CAS, and also provided an overview of Japanese history.³⁶ *Nation* used many charts and maps to explain the society and government, in contrast to many fewer such pages in *Suye*.³⁷ Embree included no discussion of his work in the War Relocation Authority in this book's introduction or acknowledgements, which is understandable given the vast gulf between the mainstream of Japanese American culture and the culture of Japan, and also his desire not to discuss his work with the WRA. However, we can see that his work in the CAS would have been

influenced by his understanding of the complexity of Japanese culture.

John Embree's anthropological work is significant as a source of information on culture and daily life at the time these books were written and also on the roles and activities of anthropologists in the early and mid-twentieth-century United States. Embree's work had many connections to other researchers but was not commonly referred to by name in most documents, and camp operations and planning largely relied on general logistics work and bureaucratic work that did not show a significant change in their operations as a result of the presence of social scientists such as Wax and Embree. He was better positioned than social scientists such as Wax and others in the JERS to affect change, and clearly made a contribution to camp operations and logistical work. His work analyzing Japanese culture remains a much more lasting contribution, which is shown by the numerous reprints of *Suye Mura* over the past few decades. It remains significant not only as an analysis of rural Japanese culture but also a historical document allowing us to see the culture of 1930's Japan. By emphasizing direct analysis of Japanese culture *in situ* he managed to provide great support to anthropological field work as a methodology and emphasize the direct study of cultures.

There were few direct intersections between culture in *Suye Mura* and in the internment camps, according to Embree's work. He found limited connections between Japanese culture and that of the typical Nisei, who were almost entirely American, and there was little reason for a man who had anthropological training that emphasized language and local circumstances to find similarities in culture when the foundations that could lead to such similarities were not there. His knowledge of Japanese culture was significant to his work as part of the WRA precisely because it helped him confirm for himself and others that the people interned in the camps were for the most part not Japanese in terms of culture or national loyalty. It is difficult to determine at this time whether this would have smoothed the acceptance of Japanese Americans back into American society to any significant extent, given the limited profile that his work at the internment camps possesses. One of the most authoritative books on the internment and relocation conducted during World War II, *Impounded*

People, does not make any reference to Embree's work.³⁸ Also, Embree deemphasized his work in the internment camps, and never significantly discussed his work in the War Relocation Authority. This is in contrast to Wax and others, who not only published articles on her work but also reexamined her work again in her book *Doing Fieldwork*, where she critiqued and criticized some of her younger views. Embree's work as a student of Japanese culture was his primary academic and professional focus, and is what he clearly preferred to publicize and discuss.

CONCLUSIONS

John Embree's motivations for not discussing his work with the War Relocation Authority and the Community Analysis Section seem to be rooted in his desire to maintain the same career trajectory he established in *Suye Mura*, rather than become involved in the world of government and social work that he was involved with as part of the WRA. It may also be rooted in a desire not to become like the socially reformist and intrusive government employees he saw in *Suye Mura*, people whose work was frequently ineffective in the eyes of both himself and Wiswell. Working for the WRA may have been far too similar in approach, with its clear directive to manage the lives of Japanese American internees while influencing mainstream American attitudes towards race and culture. It is clear that his work in the WRA was a significant part of his professional career, but it is also clear that he may have been extremely uncomfortable with or dismayed by the nature of his work. Although his work in the United States is distant from his work in *Suye Mura* both geographically and culturally, it nevertheless has value as a source of information on the nature of work in the social sciences, and on the nature of the WRA and Dillon Myer's work administering the relocation of Japanese Americans during internment. John F. Embree will remain significant as an anthropologist and his work will continue to be a source of understanding for students and researchers interested in the cultures and circumstances he analyzed and studied.

NOTES

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- ³ John F. Embree, *Suye Mura: a Japanese Village*, (Chicago: The University of Chicago Press, 1939), 37-38.
- ⁴ Akitoshi Shimizu, ed., *Anthropology and Colonialism in Asia and Oceania*, (Richmond, Surrey: Curzon Press, 1999), 135.
- ⁵ Embree, *Suye Mura*, 55, 102.
- ⁶ Smith, Wiswell, *The Women of Suye Mura*, xvi-xvii.
- ⁷ Alice Yang Murray, *Historical Memories of the Japanese American Internment and the Struggle for Redress*, (Stanford: Stanford University Press, 2008), 144.
- ⁸ Murray, *Historical Memories*, 142-144.
- ⁹ Rosalie Hankey Wax, *Doing Fieldwork: Warnings and Advice*, (Chicago: The University of Chicago Press, 1971), 65.
- ¹⁰ John F. Embree, "Dealing with Japanese Americans", October 1942, WRA Documents Section, C-1258 of 7-BU-COS-WP, William C. Carr Papers, Box. 55, Japanese American Research Project, University of California Los Angeles, 3.
- ¹¹ Smith, Wiswell, *The Women of Suye Mura*, xxxiii.
- ¹² Smith, Wiswell, *The Women of Suye Mura*, xxxi- xxxii.
- ¹³ Embree, *Suye Mura*, 105.
- ¹⁴ Embree, *Suye Mura*, 168.
- ¹⁵ Embree, *Suye Mura*, 167.
- ¹⁶ Embree, *Suye Mura*, 170-171.
- ¹⁷ Embree, *Suye Mura*, 50.
- ¹⁸ Embree, *Suye Mura*, 55.
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- ²⁰ Embree, *Suye Mura*, 37-38.
- ²¹ Dillon S. Myer, introduction to "Dealing with Japanese Americans" by Embree.
- ²² War Relocation Authority, WRA: *A Story of Human Conservation*, (New York: AMS Press, 1975),xvi.
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- ²⁴ Smith, Wiswell, *The Women of Suye Mura*, Introduction.
- ²⁵ Murray, *Historical Memories*, 157.
- ²⁶ Rosalie Hankey Wax, "Twelve Years Later: an Analysis of Field Experience," *American Journal of Sociology* 63, no. 2, September 1957, 134. *Publisher Provided Full Text Searching File*, EBSCOhost (accessed February 4, 2014).
- ²⁷ Murray, *Historical Memories*, 505.
- ²⁸ Wax, *Twelve Years Later*, 134.
- ²⁹ Wax, *Twelve Years Later*, 135.
- ³⁰ Wax, *Twelve Years Later*, 136.
- ³¹ John F. Embree, "Dealing with Japanese Americans," 3, 6.
- ³² Wax, *Twelve Years Later*, 134.
- ³³ Embree, "Note on the Net Project at Poston."
- ³⁴ John F. Embree, "Registration at Central Utah," February 1943, WRA, Community Analysis Series No. 1, Claremont Colleges Special Collections, Box 2 Folder 2, Claremont CA.
- ³⁵ John F. Embree, *The Japanese Nation*, (New York: Rinehart & Company, 1945), vii.
- ³⁶ Embree, *The Japanese Nation*, 9-12.
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GROUP MEMBER SELECTION AND INTERPERSONAL ATTRACTION BASED ON LIFE STATUS

by CORTNEY PARKHURST

ABSTRACT

The author of the present investigation studied correlations between sex, relationship status, and parental status. Three hundred and fifty college students were presented with photographs of an adult male or female and were asked to make judgments of the attractiveness of the person pictured. In some of the pictures, the target person was presented with an apparent relationship partner. In others, the person was presented with a 1-year-old child. A 2 (participant sex) x 2 (relationship status) x 2 (parental status) x 2 (target sex) between-subjects ANOVA revealed that female participants made higher attraction ratings across each scenario. In addition, the female target was viewed as more attractive than the male target. No other effects were found.

Group Member Selection and Interpersonal Attraction Based on Life Status

When working on a project it is beneficial to have multiple people working alongside each other and encouraging each other. College students report that group work is generally a satisfying and productive way to learn (Espey, 2010). However, students report they do not prefer to work with individuals who do not have the same expectations or show a lack of concern about the group grade (Myers & Goodboy, 2005). To alleviate these issues, the option of self-selecting group members would allow the group to select members whom they believe hold similar expectations on how the group should be conducted. Myers (2012) found that when given the option to self-select one's group members, the group members did not differ in their helping, civic virtue, or citizenship behaviors, although the groups self-reported higher commitment, trust, relational satisfaction, and cognitive learning than a randomly assigned work group. Once college students graduate and enter the work force, they no longer receive the option to have a classroom setting with randomly assigned or self-selected work groups. This does not mean they lose group work though. Instead, human resources select the potential "class mates" in what is defined as personnel selection. The goal of personnel

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selection is to hire the most qualified candidate for a job to join the work group. The decision on employee selection for a job position or a salary would ideally be based on objective criteria to avoid problems associated with discrimination laws. The United States government has 10 protected classes that include race, color, sex, national origin, religion, age (over the age of 40 years), disability, pregnancy, Vietnam veteran status and, most recently, sexual orientation. Title VII of the Civil Rights Act of 1964 prohibits employment discrimination based on race, color, religion, sex, or national origin. Despite the legislation, discrimination may occur in a more subtle way. For example, personnel selection may discriminate against a single male or a male with a child and show favoritism toward a married male. Employers may also select a single female to accept a job promotion over a female who recently got married or had a child. The present investigation attempts to look at the correlation between interpersonal attraction with sex, relationship, and parental status.

Interpersonal Attraction

Interpersonal attraction is the desire to approach, communicate, and interact with another individual. Interpersonal attraction is a multidimensional construct and can be measured in multiple ways including the McCroskey and McCain (1974) survey that measured physical, social, and task attraction. Physical attraction is attractiveness based on the person's looks and only their looks. A physically attractive individual is perceived to be better and more likeable than someone who is considered unattractive (Brewer & Archer, 2007). When selecting a partner to mate with, physical attraction contributed the most to interpersonal attraction and selection. A pilot study for this project found the targets of the study to be physically attractive using the physical attraction section of the McCroskey and McCain (1974) survey. The female target ($M = 4.32$) was rated as being slightly more attractive than the male target ($M = 4.08$) (Parkhurst, 2014). Interpersonal attraction is not just limited to physical attraction but can also be social and task attraction as well. Social attraction is the desire to interact with an individual on the basis of friendship in a social setting without the desire to mate or date the individual. The third construct used to define interpersonal attractiveness in the McCroskey and McCain (1974) survey was task attraction. Task

attraction, also referred to as the respect dimension, is the individual's attractiveness in a work environment. To modify interpersonal attraction in the business setting, it is important to measure social attraction, task attraction, and group attraction. Group attraction is similar to task attraction, but group attraction focuses more on the desire to select the individual as a group member, similar to how a college student self-selects for the work group.

Sex, Relationship, and Parental Status

On June 10, 1963, the Equal Pay Act of 1963 was approved and put into effect. This legislation was intended to ensure women and men are paid equally and to eliminate sex-based wage discrimination. Even with this legislation, women still experience problems associated with the glass ceiling effect, which often negatively affects a woman's ability to obtain a higher position after a certain age, marital status, and education level (Subramaniam, Arumugam, & Akeel, 2014). In Subramaniam et al. (2014), the authors found a significant relationship between a woman's manager career development and age, marital status and education, although there was no significance due to the amount of children the woman had. Jordan and Zitek (2012) found that, in a situation where someone had to be laid off and the choice was between a recently married man and a recently married woman, the recently married woman would be more likely to be let go, supporting the idea that sex discrimination still exists. Etaugh and Kasly (1981) found that males are rated more competent than women for a job. Married applicants were received more favorably than were single applicants, and the applicants who did not have children were favored over applicants who did have children. Males were judged more favorably when they were considered married than women who were married. At the age of 30 and upon getting married or having a child, women begin to experience the glass ceiling effect and feel the impact in their careers reducing their opportunities for higher management positions (Subramaniam, Argumugam, & Akeel, 2014).

People are more likely to hire a male who is married than a single male. In a situation where individuals were forced to choose whether to lay off a married male or a single male, the individuals chose to lay off the single male instead of the married male (Jordan &

Zitek, 2012). This phenomenon may occur because of a stereotype that a single male is less extroverted, agreeable, conscientious, physically attractive, satisfied with their lives, social than partner targets, and has a lower self-esteem. In addition, they are seen as more neurotic and open to new experiences (Greitemeyer, 2009). Employers tend to view married men as having characteristics that would make them more valuable to the company. Men that are married are more likely to receive a higher wage and often get more promotions. The idea that they are more likely to receive a higher wage contributed to the fact that the married men were more likely to be selected for higher-paid occupations than the unmarried men (Petersen, Penner, & Hogsnes, 2011). This idea may be due to their perceived higher competence for a job (Etaugh & Kasley, 1981). A longitudinal study done between 1966 and 1976 (Bartlett & Callahan, 1984) found that workers in the urban market made significantly more money than those in rural labor markets. Married men made 19.5 percent more than divorced, widowed, or separated male workers, and 32 percent more than the single or unattached males. Contrary to men, women are more likely to be hired when they are single, rather than when they are married or have a family. Single women are more desirable for hiring and will be more likely to progress in their careers compared to married women. Contrary to what one may believe, there is not a difference in job and work-family culture satisfaction between women and men. A study found that women who were married became less interested in extrinsic rewards over time, unlike single women (Johnson, 2005).

A pilot study for the project found that people were more socially attracted to families instead of a couple or single individual (Parkhurst, 2014). Even though social attraction may increase with a family, in the business world having a child may be considered a complication, because priorities change to focus on the children and not just the job.

In the business setting, group work is a requirement for most jobs. For this reason, students often learn to participate in groups and select team members wisely, similar to how personnel selection is done for a job. To reduce social loafing, people select team members they believe will bring the most to the group and will

put effort into the project, similar to how someone would select an individual for a position or select how much compensation the individual should receive. Attraction towards someone is determined within 100 milliseconds of stimulation with the person (Willis & Todorov, 2006). Although many people may try to avoid making judgments about others based solely on appearance, it is impossible to avoid this process and is necessary to simplify the amount of information someone takes in. In some instances, the person can manipulate the perception and judgments of others onto them. Hiring and wage selection can be positively or negatively affected by someone's relationship status, parental status, and sex.

The present investigation attempts to explore whether a person's attractiveness within a group work scenario varies as a function of that person's sex, relationship status, and parental status. It was predicted that if a male is considered to be in a relationship then his attractiveness would increase. In addition, it was predicted that a single female would be considered more attractive than a female in a relationship. Further, it was predicted that if someone has a child, his or her attractiveness would decrease. Finally, it was predicted that a male would be viewed as more attractive than a female.

METHOD

Participants

In the present investigation, 350 individuals over the age of 18 were selected to participate. In this study, 71.7% of the participants were female and 27.7% of the participants were males. Participants ranged in age from 18 to 54 years old, with a mean age of 21.9. The participants in this study were Caucasian (N= 156), Latino (N= 127), African American (N= 27), Asian (N= 24), Native American (N= 5), Asian-Indian (N= 3), Puerto Rican (N= 3) and other (N= 2). Out of 350 participants, 188 of the participants considered themselves to be single, 135 considered themselves to be in a committed relationship, 17 participants were married, 3 were separated, and 3 were divorced. Of the participants, 91.4% of them did not have a child and 8.6% of the participants had at least one child.

The researcher entered classrooms upon professors' approval and used a convenient sampling method to determine participants for the study. Participation was voluntary and no record was kept of information that could be used to identify any or all subjects. A limitation to using convenience sampling was the rare chance of demographic traits coinciding with the sample chosen.

MEASURES AND PROCEDURE

The survey consisted of 19 questions and used 12 questions from an established attraction survey to measure social and task attraction (McCain & McCroskey, 1974). The survey was modified by deleting the questions on physical attraction, and the researcher designed seven questions to determine group attraction and added the questions to the previous survey.

Photographs of the targets were taken by the experimenter in a town four-hours driving distance away from where the study was conducted to ensure protection of the targets and avoid compromising the validity of the study. Targets signed consent forms and understood how their picture would be used. Upon the professor's approval, the researcher entered selected classrooms and handed out an information sheet, demographic sheet, and a survey to all students. Students were asked not to disclose their names and were told that participation was voluntary. Then a picture (of either a female, male, female and male together, female with a child, male with a child, or a female and male with a child) was projected on a screen for everyone to see. The participants were asked to fill out a demographic sheet, asking about their sex, age, ethnicity, year in college, major, relationship status, parental status, sexual orientation, and desire for children. After the demographic sheet was filled in, students were asked to complete the survey on either the male or female in the selected photo. Once participants were done with their demographic sheet and survey, the experimenter collected their materials and the participants were then dismissed.

RESULTS

The attraction scale scores were found to be highly reliable ($\alpha = .869$). The mean attraction score was calculated for each participant and served as the primary dependent variable for the study. Means and standard

deviations for the different conditions are presented in Table 1. It was predicted that males would be more attractive when information indicated that they were in a close relationship. The results of this study failed to support this hypothesis. Male targets who were in a relationship ($M = 4.09$) were not found to be any more attractive than male targets not in a relationship ($M = 4.07$), $t(173) = .277$, $p = .782$. It was also predicted that female targets who were single would be rated as more attractive than female targets who were in a close relationship. No support was found for this hypothesis. Female targets that were single ($M = 4.39$) were not found to be any more attractive than female targets in a relationship ($M = 4.25$), $t(171) = 1.422$, $p = .157$. Furthermore, it was expected that targets with a child would be viewed as less attractive than targets with a child. No support for this hypothesis was found. Targets that were pictured with a child ($M = 4.22$) were not found to be any more attractive than targets that were not pictured with a child ($M = 4.18$), $t(346) = .735$, $p = .463$. Finally, it was predicted that male targets would be rated as more attractive than female targets. The results of the present study found exactly the opposite of this prediction. Female targets ($M = 4.32$) were rated as being more attractive than male targets ($M = 4.08$), $t(346) = 3.76$, $p < .001$.

DISCUSSION

The purpose of this study was to examine the effects of a target's sex, relationship status, and parental status on attractiveness ratings made by male and female participants. The hypotheses were that a male in a relationship would be considered more attractive and that a single female would be considered more attractive. It was also predicted that if someone had a child, his or her attractiveness would decrease. The results of this study failed to support these hypotheses. At least for our study, it did not matter whether a person was in a relationship or that he or she was a parent in regards to ratings of attractiveness.

The results found in this study also failed to support the final hypothesis that a male would be viewed as more attractive than a female. Contrary to this expectation, the results of the present study suggest that females are rated more attractive than males. This contradicts the idea of men being more likely to be selected for

a position than a female (Schultz, D. & Schultz, S., 2002). In addition, female participants made higher ratings of attractiveness for targets across all scenarios.

Implications of this study indicate a possible shift from the traditional stereotypes used for hiring and personnel selection to a more open-minded and less judgmental criteria used to determine a group member. Similar implications of the study indicate that interpersonal attraction is not as multidimensional as predicted in the McCroskey and McCain (1974) survey. The female target was viewed as slightly more physically attractive than the male target in the pilot study. Consistent with the pilot study, the female target in this study was viewed as slightly more attractive (not physical attractiveness) than the male target. People perceive that what is “beautiful” must be good (Lemay, Clark, & Greenberg, 2010). If interpersonal attraction was multidimensional, then the male target should have had the same interpersonal attraction level as the female target. If interpersonal attraction is one-dimensional, then the female target’s physical attractiveness being slightly higher would make her more attractive in task, social, and group attraction due to the idea that physically attractive individuals are perceived as better than those who are unattractive even if they are only slightly more attractive (Brewer & Archer, 2007).

A possible limitation of this study is that the task did not present a competitive position in which participants had to select only one person from multiple choices of people. This may have potentially caused distribution errors such as the strictness error, central tendency error, and the leniency errors (Aamodt, 2013). These three errors may have occurred, causing a biased result from the participants. Future studies may want to investigate group member attraction by making participants select between targets or doing a paired comparison of the two targets. A paired comparison forces the individual to select between two targets and allows the researcher to find a ranking for the individuals.

Previous research (Barlett & Callahan, 1984; Greitemeyer, 2009; Parkhurst, 2014; Peterson, Penner, & Hogsnes, 2011) indicated that males who were considered to be in a relationship or married would be seen as more attractive than single men, while single females would be viewed as more attractive than

females in a relationship (Jordan & Zitek, 2012). It is possible that the results of this study failed to support this hypothesis due to the age of the participants and the age of the target. Legislation protects against age discrimination with the Age Discrimination in Employment Act of 1967, also referred to as ADEA. This legislation prohibits discrimination toward people over the age of 40. Although passing this legislation has been productive in helping to prevent companies from only hiring younger people, it still has not helped in certain types of jobs and the progression of individuals. Age is a protected class that could influence the decision of group member selection. The targets in this study were young adults, which could have had an influence on the participants. The participants were also college students, which may have had an impact on the attraction ratings. Future studies should investigate the attraction scores of targets and participants of different ages.

Limitations of this study also include a high number of female participants. The female participants ranked higher attraction scores across all scenarios. People tend to find similarity attractive (Fletcher & Simpson, 2000). Attraction is usually associated with partner selection but can also be associated with group member selection. Another limitation of this study is that the majority of the participants being female may have caused attraction to females to be higher than males. Future research should investigate the likelihood of a sex being more interpersonally attracted to a member of their same sex.

Understanding discrimination and stereotypes is essential for selecting members of a group. Expanding the knowledge of team selection and stereotypes can provide a more efficient and effective work environment and allow teams to select members based on their capabilities rather than their physical attractiveness, sex, relationship, and parental status.

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TABLE 1.
Mean Attraction for Different Target Sex, Relationship Status, and Parental Status based on Participant Sex

Rel. Status	Parent Status	Participant Sex	Female Target			Male Target			Total Target		
			M	SD	n	M	SD	n	M	SD	n
Single	Children	Male	4.11	0.42	5	4.05	0.69	10	4.07	0.60	15
		Female	4.36	0.56	37	4.14	0.71	33	4.25	0.64	70
		Total	4.33	0.54	42	4.12	0.70	43	4.22	0.63	85
	No Children	Male	4.15	0.52	11	4.01	0.61	9	4.08	0.55	20
		Female	4.53	0.55	36	4.03	0.40	41	4.26	0.53	77
		Total	4.44	0.56	47	4.03	0.44	50	4.23	0.54	97
	Total	Male	4.13	0.56	16	4.03	0.64	19	4.08	0.56	35
		Female	4.44	0.56	73	4.08	0.56	74	4.26	0.58	147
		Total	4.39	0.55	89	4.07	0.57	93	4.22	0.58	182
In Rel.	Children	Male	4.27	0.89	15	3.93	0.61	21	4.07	0.74	36
		Female	4.48	0.59	28	4.16	0.54	21	4.34	0.58	49
		Total	4.41	0.70	43	4.04	0.58	42	4.23	0.67	85
	No Children	Male	3.78	0.80	13	3.74	0.47	13	3.76	0.64	26
		Female	4.23	0.45	28	4.34	0.41	27	4.29	0.43	55
		Total	4.09	0.61	41	4.15	0.51	40	4.12	0.56	81
	Total	Male	4.04	0.87	28	3.85	0.56	34	3.94	0.71	62
		Female	4.36	0.53	56	4.26	0.47	48	4.31	0.51	104
		Total	4.25	0.67	84	4.09	0.54	82	4.17	0.62	166
Total	Children	Male	4.23	0.79	20	3.97	0.63	31	4.07	0.70	51
		Female	4.14	0.57	65	4.15	0.64	54	4.29	0.61	119
		Total	4.37	0.63	85	4.08	0.64	85	4.22	0.65	170
	No Children	Male	3.94	0.69	24	3.85	0.53	68	3.90	0.62	46
		Female	4.40	0.53	64	4.16	0.43	22	4.27	0.49	132
		Total	4.27	0.61	88	4.08	0.47	90	4.18	0.55	178
	Total	Male	4.08	0.74	44	3.92	0.59	53	3.99	0.55	251
		Female	4.40	0.55	129	4.15	0.53	122	4.28	0.66	97
		Total	4.32	0.52	173	4.08	0.56	175	4.20	0.60	348

INDIVIDUALISTIC PRIMING ON DONATION CHOICES

by MEGAN E. PERKINS & MIGUEL A. MORENO



ABSTRACT

Previous research suggests that money priming increases self-focused behaviors. The current study investigates whether money priming influences the donation of necessity versus luxury products. Overall, we predicted participants will donate necessity products more than luxury products and that money-primed participants would donate luxury products less than necessity products. Although participants did donate necessity products more than luxury, money-primed participants showed less distinction between the two. Although money priming did not influence behavior as expected, there is a clear influence of money priming on donations. Whereas the tendency in general is to focus on utilitarian needs over hedonic wants, money priming may distort this bias.

Individualistic Priming on Donation Choices

Money, even just the mere presence of it, has the ability to influence a wide variety of effects. Money's presence can influence a range of behaviors and cognitions including social relations, consumer decisions, donation decisions, ethics, morals, politics, emotions, and motivations (Briers, Pandelaere, Dewitte, & Warlop, 2006; Caruso, Vohs, Baxter, & Waytz, 2013; Chatterjee & Rose 2012; Chatterjee, Rose, & Sinha, 2012; Liu & Aaker, 2008; Ma-Kellams & Blascovich, 2013; Mogilner, 2010; Mogilner & Aaker, 2009; Roberts & Roberts, 2012; Tong, Zheng, & Zhao, 2013; Vohs, Mead, & Goode, 2006; Vohs, Mead, & Goode, 2008; Kouchaki, Smith-Crowe, Brief, & Sousa, 2013; Zhou, Vohs, & Baumeister, 2009). The focus of this study is the behavioral influences of money on donation and product type.

Effects of Money Priming: The Self-Sufficiency Effect

Often, behavioral influences occur with little to no awareness of the subtle exposure to money. Activation of an idea or concept by a stimulus with little to no participant awareness is known as priming. The subtle presence of money may prime participants to non-consciously remind them of ideas and concepts strongly associated with money (Vohs et al., 2006). In this study, the presence of money is intended to activate

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tangible concepts rather than abstract concepts (e.g. assets, property or services).

Vohs et al. (2006) conducted nine experiments investigating money priming on various behaviors. Based on their results, Vohs et al. concluded that money priming reduces helpful attitudes towards others, increases preference for solitary activities, and decreases sociability. However, money priming also increases willingness to take larger workloads and motivation to work longer. Overall, money-primed participants demonstrated more independent, individualistic type behaviors compared to non-primed participants. Vohs et al. (2006) used the term “self-sufficiency” to describe these individualistic behaviors prompted by money priming. Interestingly, priming concepts of financial struggles or smaller currencies eliminated the self-sufficiency effect (Vohs et al., 2006).

The Mechanisms of the Self-Sufficiency Effect

Lea and Webley (2006) propose two explanations as to why humans pursue money: tool theory and drug theory. Tool theory suggests that humans pursue money because of money's functional ability to be exchanged for goods and services. Tool theory has been the primary explanation of the human desire for money. Lea and Webley support tool theory yet provide many examples in which tool theory fails to fully explain the desire and use of money. Drug theory then supports where tool theory fails. According to drug theory, money is neither valuable nor significant to human survival, evolution, or biology. Yet by biologically mimicking an evolutionarily instinct, money becomes valuable. Drug theory proposes that money acts as a drug by activating, or over-activating, brain areas dedicated to reciprocation and trade processes. Trade processes are assumed to be an instinctual drive. Since money, in the modern ages, is used to satisfy these drives in place of previous evolutionary processes used (reciprocation), these drives have now become conditioned with money. Because money has been conditioned with trade drives, it is able to activate trade centers in the brain, making one anticipate trade possibilities and advantages when there are none present. With money, our brain centers for trade are falsely activated, and in a sense, tricked into an illusion of trade (Lea & Webley, 2006). However, some researchers, such as Dewitte (as cited in Lea & Webley, 2006), have challenged this idea, proposing

autonomy as the instinct money acts upon rather than trade. In this explanation, money may allow an increase in autonomy yet simultaneously diminish interpersonal dependency.

Social relationships may have developed through the trade process due to their evolutionary survival benefits (Lea & Webley, 2006). A barter system of trade requires intimate awareness of others' needs in order to acquire goods for service. Trade based on money reduces the requirement to know what others need. Money may be a tool that allows trade with less personal involvement. Therefore, trade using money emphasizes egocentric needs and desires rather than the others' needs. Assuming there are trade centers in the brain, money may act as a drug to stimulate the brain without requiring socially dependent trade (Lea & Webley, 2006). Vohs et al. (2006) offers similar reasoning, explaining that as societies developed, communal relations may have been severed and individualism enhanced due to one's ability to independently attain desires and needs through money.

Both tool and drug theories assume a social relations aspect tied to trade. If money use is linked to social drives, then we would expect models that involve interactions between social and economic variables. In Fiske's (1991) model, market pricing is a type of human social interaction which causes one to view their social relations as transactions in terms of benefits to the self. Since money is the primary mode of exchange in market pricing, priming a person with money should cause activation of this mode (Vohs et al., 2008). Activating this mode may result in insensitivity to other's needs mediated by an increased focus of the self (Vohs et al., 2008). Interestingly, yet not surprisingly, the mode representing intimate relations lies opposite the market pricing mode, suggesting these modes are opposites. Therefore, behaviors and effects associated with each will most likely conflict (Fiske, 1991; Vohs et al., 2008).

Effects of Money Primers on Donation Decisions

Altruism. A controversial topic that has puzzled humans for centuries is altruistic behavior (Andreoni, as cited in Cappellari, Ghinetti & Turati, 2011). Much research has been conducted questioning motivations of altruistic behavior. Hamilton (1964) explains altruism through kin selection, meaning we are altruistic due to our

genetic relations. Reciprocity theory suggests humans are altruistic because it is beneficial to the self and society (Nowak & Sigmund, 2005). However, theories such as pure altruism and empathy-altruism theory suggest altruism is due to empathy for the recipient in need, rather than possible benefit to the self (Andreoni, as cited in Cappellari, Ghinetti & Turati, 2011; Batson, as cited in Van Lange, Bekkers, Schuyt & Vugt, 2007). Lea and Webbly (2006) suggest humans may even contain an altruistic drive, explaining why humans barter and trade.

Altruism may be involved in donation behaviors which may in fact be described as altruistic behavior. Some models encompass a wide range of possible factors influencing altruistic behaviors. Benabou and Tirole (2006) provide a model that explains how factors influencing altruism relate to the donation process. These factors include intrinsic motivation, self-image, and social esteem as donation motivators.

The current study aims to explore whether money priming and product type influences individualism and altruism when making donation decisions. Results of the current study may aid in explaining why humans are altruistic.

Donations and money primers. Research concerning money primers and donations often suggest money primers decrease one's donation likelihood. Roberts and Roberts (2012) conducted an experiment exploring the effects of money primes on adolescents' donations and donation attitudes. The findings implied that money primes decrease the amount of donation and depress attitudes towards donating. In a similar study, Vohs et al. (2006) found that participants primed with money donated significantly less money than those not primed.

Donations, empathy and money primers. Empathy is a significant predictor of one's likelihood of donating. Prosocials, that is, those with high levels of empathy, donate larger amounts and donate more frequently than individualists and competitors (i.e. those lower in empathy) (Van Lange et al., 2007; Verhaert & Poel, 2011). Research implies positive correlations between generosity and empathy, suggesting that empathy is an important factor in donation decisions (Bekkers, 2006; Verhaert & Poel, 2011). Therefore, it's likely that empathy may be a factor interacting with the

self-sufficiency effect. Studies examining the effect of financial incentive on one's ability to determine another's emotions (empathy) suggested that monetary incentive may decrease empathy due to one viewing themselves as less relational to others (Ma-Kellams & Blascovich, 2013). Therefore, the self-sufficiency effect mediated by impairment in empathy and elicited by money primes may lead to a decreased likelihood of donating and possibly a decreased donation amount as well.

Product Type

Product type, consumer decisions, and donation decisions. Although money priming is predicted to influence donation decisions, these decisions may also be influenced by what is being donated. The product type may influence decisions and alter the influence of money priming.

Most research concerning product type influence has been conducted in the field of cause-related marketing, in which companies donate a percentage of their profits from consumers' product purchases to charities (Varadarajan & Menon, 1988). Strahilevitz (1999) investigated influences of product type and donation size on consumer decisions. Consumers were more willing to purchase hedonic, rather than utilitarian, products when donation incentives and price differences were large. When assessing smaller donation incentives and price differences, (e.g. choosing a \$25 product with 5% profit to charity or a similar product sold at \$20 with no profit to charity), product type (utilitarian or hedonic) did not influence one's decisions (Strahilevitz, 1999; Strahilevitz & Myers, 1998). Strahilevitz (1993, 1999) termed these results as affect-based complementarity.

Strahilevitz explained his results in terms of the emotions hedonic products elicit (pleasure and guilt) and the emotional states elicited by donating. In cause-related marketing, hedonic products work well when raising charity funds because the emotions associated with hedonic products are counterbalanced with emotions elicited by donating. For example, one is more likely to purchase a \$500 television rather than a \$500 furniture set if \$100 of the television cost (hedonic product) goes to charity, because the donation emotions (positivity, empathy) complement the hedonic product emotions (guilt, pleasure). According to cause-related marketing donations, the emotional stimulation elicited by the

hedonic product facilitates a high-cost purchase. In a low-cost situation, donating a small amount seems to be a small, worthy sacrifice to make. Therefore, emotional stimulation elicited by hedonic products does not seem to effect these decisions (Carson & Mitchell, 1993; Strahilevitz, 1993, 1999).

When activating the concepts of money versus time, Mongilner and Aaker (2009) found that money primes led participants to feel more personally connected and favorable towards products associated with high social status. High-prestige products often have hedonic attributes. Therefore, according to Strahilevitz's (1993) and Mongilner and Aaker's (2009) results, one may be more likely to favor a hedonic product rather than a utilitarian one in certain situations, such as large charity incentives or priming with money.

Luxury, or hedonic, products may also be more favorable than necessities due to their designed ability to appeal to **consumer's** self-concept and worth (Tasi, 2005; Vigneron & Johnson, 2004). Since individualistic, self-focused behaviors are produced when one is primed by money and luxury products encourage individualism, one primed by money may be more likely to favor luxury products rather than necessity products.

Overall, we predict a higher level of donation likelihood for necessity (utilitarian) products compared to luxury (hedonic) products. If decisions to purchase utilitarian products are driven by "should" (rationally reasoned, practical associations) or "ought to" (emotionally driven, hedonic associations) preferences, then utilitarian products should be perceived as "should" items in donation decisions (Shiv & Fedorikhin, 1999; Wertenbroch, 1998).

HYPOTHESES

Based on the previous studies discussed within this article, the current researchers propose three hypotheses: (1) the group primed with money will donate less than the non-primed group; (2) most donated products will be necessity items; (3) the money-primed group will donate more necessity items.

METHOD

Participants

One hundred and forty-five undergraduate students from Texas A&M University-Corpus Christi participated in this study according to approved IRB procedures. All participants were recruited with instructor approval and were 18 years old or older.

Stimuli

Two pilot studies were conducted prior to the experiment in order to define the terms luxury and necessity. Forty-four participants participated in the first pilot study. Thirty-four participants participated in the second pilot study.

Each pilot survey displayed a product image with four items addressing the necessity and luxury value, acceptability of purchasing, and frequency of use of each product. The items included one yes-no item and three 5-item Likert-scale type response options (1= very unlikely, 5= very likely). Product presentation order was randomized while the response items remained consistent with each product image. The pilot studies differed only in product images. The second pilot survey was necessary due to a number of products in the first pilot survey yielding unusable results. Based on the results from the pilot surveys, 10 luxury-necessity product pairs were matched on value: lotion-soap, instruments-sports equipment, olive oil-butter, dress shoes-running shoes, cake-bread, a paper shredder-a printer, alcohol-medical alcohol, a tablet-a laptop, and coffee-milk. Each product image was brand-ambiguous. The images used were taken by the primary researcher from freedigitalphotos.net or from the noncommercial reuse section of Google images.

The primary researcher visited classes to recruit participants. All participants were read a short speech informing them of the study and encouraging them to participate if possible. Participants were then given a piece of paper with the survey website and contact information of the researchers. Participants were instructed to connect to the website at any location and on any device with internet connectivity. The first page displayed on the surveys was the information sheet, which participants read and understood before beginning. Pilot participants then completed the 5-10 minute survey.

Materials

The materials used in this study included photographs of products, survey questions, and an image of currency.

The experimental survey consisted of three sections addressing participant demographics, willingness to donate product items, and willingness to donate hypothetical money to a donation organization of the participants' choosing. Items assessing participants' willingness to donate product objects included one 5-item Likert-scale type response option (1= very unlikely, 5= very likely). Section three provided ten donation organizations, as well as an eleventh choice, in which participants could write in a preferred donation organization. Participants were allowed to hypothetically donate two dollars to one organization, donate two dollars to two separate organizations (one dollar going to one organization, while the other dollar goes to a different organization), donate one dollar to an organization and keep the other dollar, or keep both dollars. The only difference between the neutral and money-primed groups' surveys was the background displayed. The neutral group's survey background was a grey, neutral background. The money-primed group's survey background displayed U.S. currency in the form of cash.

Qualtrics was the survey program used to create all surveys used in this experiment. Qualtrics allowed participants to be assigned a random, anonymous IP address, so participant's identities could not be linked to their results.

Procedure

The experiment participants were given the times, locations, and dates of study sessions and encouraged to attend one that complied with their schedule. Data collection was done according to these procedures in order to avoid complications of collecting identification information. The experiment consisted of 145 participants; 66 participants took part in the money-primed group and 79 took part in the neutral group. The money-primed group was primed by a survey background image of U.S. currency. The survey background image for the neutral group displayed the survey program's usual background, being a plain, grey background. So that the money-primed group would not find the money background suspicious, which may

have altered their results, the survey was conducted within the business department on campus. Due to the surrounding environment, which often displays a theme of economic and business endeavors, researchers assumed a money background would not seem out of the ordinary. The neutral group study sessions were held in a classroom building on campus. The rooms reserved for the money-primed and neutral groups had a similar environment and structure, which allowed for avoidance of confounding variables. When participants began arriving to their chosen study session, they were instructed to choose any seat that provided them with a computer. Participants were then asked to connect to the survey website via their computers. The first page displayed on the surveys was the information sheet, which participants read and understood before beginning the experiment. Participants then completed the 5-10 minute survey. Upon completion, participants were thanked and excused.

RESULTS

The study included a 2×2 experimental design with product type (luxury vs. necessity) and group (primed vs. neutral) as the independent variables. Product type was a within-subjects variable, while group type was a between-subjects variable. The dependent variables were the rating of how likely participants were to donate an item which ranged from one (very unlikely) to five (very likely) and the frequencies of donating hypothetical money.

Survey completion times were assessed for each participant. Nine out of 145 participants (6.2%) had completion times of less than two minutes. Completion times of less than two minutes had questionable reliability. Therefore, these participants' data were removed from the study.

The average donation ratings and standard deviations for necessity and luxury items by group (neutral vs. primed) are shown in Table 1. An ANOVA was conducted to analyze subject data. There was a main effect found for the product type, $F(1, 134) = 29.72$, $p = .000$, $\eta_p^2 = .182$. Overall, participants rated their likelihood to donate necessity items higher than luxury items. So, we reject the first null hypothesis which predicts no difference in likelihood of donating luxury

or necessity items. Overall, there was no difference in the likelihood of donating between primed and neutral groups, $F(1,134) = .076$, $p = n.s.$ There was a marginally significant interaction found between group and product type, $F(1,134) = 3.48$, $p = .064$. Priming with money reduced the magnitude of the product type effect. In other words, those primed with money treated luxury and necessity products more similarly in their likelihood of donating than those not primed.

TABLE 1.
Mean donation rating by group and product type

Group	Product Type	
	Necessity	Luxury
Neutral	3.50 (0.72)	3.17 (0.73)
Money-Primed	3.44 (0.71)	3.28 (0.73)

NOTE: Standard deviations are reported parenthetically

Hypothetical Donations

The distribution of participants who chose to donate one dollar, two dollars, or none was compared between the primed and neutral groups using a chi-square analysis. Overall, most participants chose to donate two dollars, and few participants chose to not donate or to donate only one dollar. This pattern was not significantly different between the primed and neutral groups.

DISCUSSION

The study results conform to our first hypothesis, that participants are more likely to donate necessity products than luxury products. These results on donations are consistent with results on consumption. Interestingly, when examining hedonic versus utilitarian consumption, buyers tend to purchase utilitarian products more often. One possible explanation for the difference is that utilitarian product purchase seems to be easier to justify and more socially acceptable (Dhar & Wertenbroch, 2000; Okada, 2005; Kivetz & Zheng, 2006; Tong et al., 2013). Societies tend to satisfy basic, utilitarian needs before hedonic wants, as utilitarian needs are seen as more essential (Berry, 1994). Perhaps the priority of utilitarian needs transfers to donating

behavior in an attempt to assure society's utilitarian needs are met first. Moreover, the justifiability of utilitarian purchases may transfer to donations of utilitarian products. Future research may compare the likelihood of donation of products that differ specifically on consumer justification to determine if the current results may be explained by such a transfer.

The way in which the researcher posed the survey questions may have also affected the types of products donated. For example, people tend to keep a more hedonic product in a forfeiture choice task, in which one chooses to lose an item previously in their possession. However, people tend to select utilitarian products in an acquisition choice task, in which one chooses to gain an item previously not in their possession (Dhar & Wertenbroch, 2000). In the current study, a forfeiture choice was asked in both treatments, which according to Dhar and Wertenbroch (2000), would increase the likelihood that participants would hold onto the hedonic (i.e. luxury) products. However, forfeiture and acquisition choice task influences on product type have not been examined in combination with the effects of money primes. If priming a money concept increases self-interest, then future studies may investigate how money priming changes the task effect (forfeiture vs. acquisition) on choice decisions. Yet, in the current study, both groups were presented with a forfeiture task, so any change in donation likelihood can only be attributed to the activation of a money concept. Interestingly, in the primed group, participants donated slightly more luxury products than in the neutral group, which may have been due to the money primes.

We found no support for our hypothesis that money priming would decrease the likelihood of donating products. The hypothetical donation rates were examined for each group, and the proportions of participants donating no dollars, one dollar, or two dollars differed little between the groups. These results conflict with previous research, which suggests that people primed with money usually donate less than those not primed with money (Roberts & Roberts, 2012; Vohs et al., 2006). They may therefore be due to error within the current study.

It was hypothesized that activating a money concept would change the likelihood of donating necessity

versus luxury items, which was supported in part by the interaction. The neutral group had a wide margin between likelihood of donating luxury versus necessity products, with the likelihood of donating necessity products being higher. The primed group showed this same effect, yet the margin between likelihood of donating luxury versus necessity products decreased. One interpretation of this interaction is that the activation of a money concept minimized the distinction between necessity and luxury products. This result presents a surprising oddity to the researchers, as it has not been evidenced in previous research to the current researcher's knowledge. Therefore, it is difficult to understand the underlying mechanisms producing this effect. Because the interaction was only marginally significant, more research is needed to verify if the interaction is a reliable pattern.

Errors

A possible explanation for the difference between our results and the hypotheses derived from previous studies are the errors in the current study. For example, subtle difference in irrelevant image features (lighting, background, etc.) may have contributed to the error obscuring the true effect. However, it is unlikely that such subtle differences would be sufficient to change that pattern of data.

The way in which survey questions were asked also poses a possibility for error. Dhar and Wertenbroch's (2000) results, indeed, support the claim that the way in which a choice is posed can alter one's decision. It would have been wise to have specified that the products shown in the images referred to that type of product (not the exact product in the image), that the product was able to be donated (product was clean, intact), and that the receivers of the donations had the means to efficiently store the donations (i.e. refrigerate, freeze, store, etc.), as some participants desired specifications in these areas. It would have also been interesting and wise to provide a free response section in which participants explained the significance of their response; this may have provided more insight in understanding participants' decisions.

The factor which most likely caused the greatest error was the types of money primes used. The U.S. cash currency survey background and the building

the primed group surveys were held in (business and economics) acted as the money primes. The prime of money as a background has previously produced significant results suggesting the self-sufficiency effect (Roberts & Roberts 2012; Vohs et al., 2006). It's possible that in the current study participants were not exposed to the prime for a sufficient amount of time to produce any significant effect. However, in previous research studies, participants were subtly and briefly exposed to the money primes, yet still yielded significant results (Roberts & Roberts, 2012; Vohs et al., 2006). A sufficient time of exposure to money primes has also not been suggested by previous work. So, although the length of time of exposure to money primes may have affected results, it seems less attributable than other factors. A more attributable factor is the types of money primes used. The money primes used may not have been frank enough to produce a significant effect. Vohs et al. (2006) stated that the self-sufficiency effect is not produced when thoughts of minor finances are activated. In order for the self-sufficiency effect to be produced, thoughts of larger amounts of wealth need to be activated. It may also be possible that the money primes used encouraged a different effect than expected. Zhou et al. (2009) showed that, depending on the consumer and situation, one may associate money primes with personal strengths or threats and losses. Further evidence does suggest that when thoughts of minor finances are activated, feelings of loss and threat are produced, therefore creating a more concrete mindset in which one aims to avoid undesirable outcomes (Hansen, Kutzner, & Wänke, 2013; Tong et al., 2013). This type of mindset is known as prevention focus. Activation of prevention focus leads to an increased likelihood of focus on utilitarian aspects (Tong et al., 2013). Tong et al. (2013) studied prevention versus promotion focus's effects on product type when one is primed with money. Their results suggested that when money primes activate prevention focus in a choice task, the utilitarian product has a higher likelihood of being chosen. This evidence may provide more insight as to why the current study's participants had a higher likelihood of donating necessity products rather than luxury products.

Limitations

Many limitations were present in the current study. One limitation was sample size. Although a decent amount of students participated, a larger sample size would have been ideal. The distribution of participants among the two treatments was fairly equivalent, yet exact equivalence would have been ideal. The current study also dealt with a limited sample location. The study could have benefitted from expanding and diversifying locations, so that results could be applicable to many differentially located samples. However, the similarity of participants being part of the same community and location also provided a benefit. This allowed researchers to have higher certainty that a manipulated variable was causing a difference in the experiment, rather than participants' individual differences.

Further Implications

The current researchers believe it may be beneficial to the field of behavioral economics to replicate this study in the future with changes made to accommodate errors. The current researchers hope to find and inspire

more research in topics exploring money priming's effects on types of products donated and why. A wealth of research has been conducted on effects of money primes. However, less research has been conducted on types of products donated, and even less considered how money primes affect what one donates. The research that has been conducted in those areas often applies to consumers rather than donors. This was of some help to the current study, yet was cautiously approached due to the possibility that consumer decisions and donation decisions may operate by different processes. Attention should be paid to these areas of research as the significance of such research is great. Further research should be conducted in these areas aiming to understand the effects and significance of those effects produced by money primes, types and reasoning of products donated, and how money primes influence types of products donated. Many people involved in donation sectors could greatly benefit from this research including those donating, those receiving donations, donation organizations, and companies.

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THE RELATIONSHIP BETWEEN VISUAL SKILLS AND BATTING PERFORMANCE OF PROFESSIONAL BASEBALL PLAYERS

by ABBY QUIÑONEZ

ABSTRACT

Visual skills training has become a widely debatable topic regarding its effect on an athlete's ability to enhance performance within a sport. While some evidence has shown that visual skills can show a direct correlation in performance of a sport, it is unknown if all sports alike show an increase in performance. The purpose of this study was to investigate the relationship between visual skills and the batting performance of professional baseball players. Participants included 352 professional baseball players evaluated on their visual skills as compared to batting performance variables during the 2013 minor league baseball season. Visual skills were assessed using the Vizual Edge Performance Trainer® (VEPT), a commercial software program designed to assess eye alignment, depth perception, flexibility (convergence and divergence), visual recognition, and visual tracking. Upper and lower quartiles were created based on each player's overall VEPT score. The final VEPT score was then

compared to six batting performance variables including batting average (BA), base on balls percentage (BB%), strikeout percentage (SO%), on-base percentage (OBP), slugging percentage (SLG) and on-base plus slugging (OPS). Descriptive statistics were used to provide the analysis of each player's performance based on their visual skills. The results of the study indicated significant differences for BA (.268 to .253), SO% (.226 to .260), OBP (.334 to .283), and OPS (.713 to .667) for the upper and lower 25% quartiles. The analysis of the upper and lower 10% quartiles of VEPT scores showed greater disparities in BA (.272 to .250), SO% (.226 to .260), and SLG (.398 to .381). The results of the study concluded that there is evidence to support the importance of implementing visual skill training into an athlete's routine training programs. Due to the significance of visual skills found in the batting performance variables and other important areas within baseball, it is suggested that programs such as VEPT be used in training regimens to assess baseball players' performance on and off the field.

Keywords: VEPT, batting performance variables, visual skill, professional baseball players



MENTOR
Dr. Frank Spaniol

Professor
Department of Kinesiology
College of Education

INTRODUCTION

Visual skills play a large role in the outcome of the sport or the likeliness that the player drafted will become a successful athlete. Hand-eye coordination and reaction time are greatly impacted by athletes' visual skills. Vision serves as a medium used by athletes to interpret their

surroundings and response time to certain situations. Thus, having enhanced visual skills can lead to a greater performance (du Toit et al., 2010).

Many sport ophthalmologists and sport experts define sport vision as “a group of techniques directed to preserve and improve the visual function with a goal of enhancing performance through a process” (Maman, Gaurang, & Sandhu, 2011). It often involves training the athletes’ eyes to learn the acquired vision behaviors necessary to be successful within their sport (Labib, 2014). Visual training that utilizes Visual Edge Performance Trainer (VEPT), Dynavision, or other general vision testing techniques can lead to improved performance compared to athletes who do not partake in vision training (Spaniol et al., 2008). The question of whether vision exercises can enhance visual skills and motor performance is still very debatable. Many experts do agree that vision training can enhance performance, while others credit test familiarity and talent to improved performance results (du Toit et al., 2011).

VEPT is a software program designed to test five areas of vision including visual alignment, depth perception, visual flexibility (divergence and convergence), visual tracking, and visual recognition (Visual Edge, 2012). Through VEPT, researchers, developers, and coaches are provided with each of the subject’s test scores for each of the five visual categories. VEPT can enhance an athlete’s speed and efficacy with regular use of the software (Review of Optometry, 2008). Through the use of VEPT, researchers may determine if professional baseball players can achieve improved performance with the appropriate visual training. For this study, only the final VEPT scores will be taken into consideration when determining the performance outcome. VEPT training sessions can last anywhere between 6-30 weeks with 1-3 days of training each week (Review of Optometry, 2008). Previous studies suggest visual training can improve sport performance. However, it is noted that more research is needed focusing on other sports in order to allow generalizability (Maman, Gaurang, & Sandhu, 2011). In order for generalized visual testing to be perceived as effective in sport performance, a significant improvement in both the vision and motor performance of the athletes should be recognized. Any improvement that is established through research should be credited to the gained familiarity of visual skills and not the gained familiarity of visual testing (Abernethy & Wood, 2001).

The purpose of this study was to investigate the relationship between visual skills and the batting performance of professional baseball players. Participants included 352 professional baseball players evaluated on their visual skills as compared to batting performance variables during the 2013 minor league baseball season. Batting performance variables included batting average (BA), bases on ball percentage (BB%), strikeout percentage (SO%), on base percentage (OBP), slugging percentage (SLG) and on base plus slugging percentage (OPS). Results were compared to their batting performance variables during the 2013 minor league baseball season.

LITERATURE REVIEW

Vision in Sports. Research in sports such as baseball requires multiple studies to determine the effect and need of vision exercises for athletes of all levels. Each study provides insight on how improvement in athlete development within the sport increases when vision training was incorporated into the training regimen.

Sports vision is defined as a “group of techniques directed to preserve and improve the visual function with a goal of enhancing performance” (Maman, Gaurang, Sandhu, 2011). Numerous studies have been conducted to acknowledge the importance of incorporating visual training into sport training programs. These studies have worked to showcase that athletes exhibit a heightened visual sense when compared to non-athletes. Likewise, professional-level athletes’ parameters are better than athletes of lower skill (Zwierko, 2007).

A study conducted by Clark et al. (2012) tested the reliability and validity of visual skills on athletes to determine if an improvement in vision after high performance training was noted. Players participated in a pre-season and in-season visual training regimen using equipment such as Dynavision® and near far training (Clark et al., 2012). In comparison to the results from past seasons, the team increased their batting average and on-base percentage. This study indicated that visual skills exercise, implemented into the athletes’ daily routine, improved team batting performance. In addition to Clark’s study, Oudejans (2012) conducted research on elite female basketball players by comparing the results of their visual control training. The study consisted of each player shooting 50 free-throw shots and Plato LC goggles were used for both the control

and experimental group for their pre-test and post-test results. Oudejans concluded that an increase (6-18%) in vision control was demonstrated in the experimental group when compared to the pre-test and post-test.

Visual Skills. Generalized vision programs, often used by sport optometrists, concentrate on three key assumptions to determine the validity of the program: vision is directly related to sport performance, visual attributes can be trained for sport use, and lastly, vision training will increase performance within the sport (Abernethy and Wood, 2001). Although research is being conducted on the role of visual skills in sports, it has been shown that vision plays a significant role in determining an athlete's response time, hand-eye coordination, balance, and spatial orientation (Maman, Gaurang, Sandhu, 2011). Knowing the benefits of visual training and performance can result in more data-driven decisions during the recruiting and drafting process. Vision may be a strong indicator that can influence the physical performance of an athlete (Jafarzadehpur and Yarigholi, 2004). Therefore, visual skills testing may be a determining factor in the assessment of the visual skills of athletes.

Vizual Edge Performance Trainer®. Vizual Edge Performance Trainer (VEPT) is a computer-based vision test that is used to enhance an individual's visual skills using 3D equipment and five test areas including visual recognition, visual tracking, flexibility, depth perception, and eye alignment (Vizual Edge, 2012). VEPT is also used as a trainer for individuals and athletes (Review of Optometry, 2012). Through VEPT, subjects are tested pre- and post-season to determine if visual training actually improves performance during season play. Previous studies have been conducted testing the reliability and validity of visual skills testing with athletes in order to determine a correlation between high performance and visual skills in athletes (Clark et al., 2012). VEPT is the primary visual training program used for this study. Through VEPT, researchers will gain a better understanding of the benefits associated with vision training.

METHODS

Subjects and Sampling

The data necessary for this project was archival and collected from 352 professional baseball players who participated in the 2013 minor league season.

Additionally, the data was collected as part of a pre-draft assessment process.

Instruments

Visual skills were assessed by VEPT. Scores from each of the five visual elements were combined and calculated to provide a comprehensive VEPT score for all subjects. Testing occurred prior to the start of the 2013 minor league season. The final VEPT score was then analyzed and compared to the **player's** batting performance.

Research Design and Statistics

Independent t-tests and Pearson's correlation coefficient (r) were used to determine if a statistically significant difference existed between group means for batting average (BA), bases on balls percentage (BB%), strikeout percentage (SO%), on base percentage (OBP), slugging percentage (SLG), and on base plus slugging (OPS).

Procedures

IRB approval was established from the Texas A&M University-Corpus Christi Institution Review Board (IRB). Permission was obtained from Vizual Edge providing for analysis of the visual skills data collected from the professional baseball players. Prior to testing, subjects were allowed practice trials in order to establish test familiarization. Test administrators informed all subjects of necessary instructions and remained on-site to provide help throughout the entire test. From the five components tested, a final composite VEPT score was calculated determining the visual skill level of each athlete. Scores were then tested against the batting performance variables, which were obtained prior to the start of the 2013 minor league baseball season.

The VEPT score and batting statistics of each of the subjects were inputted into a datasheet using Microsoft Excel Spreadsheet software. Upper and lower quartiles were created using the comparison of the batting performance variable based on the visual skills scores in order to determine if any discrepancies existed within the data. An independent t-test and descriptive statistics were used to compare the upper and lower quartiles of the VEPT means to determine a statistical difference. Pearson's correlation coefficient (r) was used to determine if a relationship existed between VEPT and batting performance. For statistical purposes, the probability used for this study was $p=0.05$.

TABLE 1.

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
VEPT	352	48.220	43.060	91.280	79.13	6.550	42.90
BA	352	.253	.110	.363	.254	.040	.002
BB%	352	.273	.028	.301	.108	.045	.002
SO%	352	2.426	.005	2.430	.250	.163	.027
OBP	352	.319	.173	.492	.333	.047	.002
SLG	352	.512	.119	.631	.374	.081	.006
OPS	352	.739	.297	1.036	.707	.116	.014
Valid N	352						

Table 1 depicts the descriptive statistics of the group mean values of the batting performance variables and the VEPT scores of all of the baseball players involved in the study (n=352).

TABLE 2.

	VEPT	BA.	BB%	OBP	SLG	OPS
Average	Upper	Upper	Upper	Upper	Upper	Upper
Quartiles	86.6	.257	.098	.329	.337	.713
	Lower	Lower	Lower	Lower	Lower	Lower
	69.7	.257	.106	.334	.283	.667

Table 2 provides an illustration of the upper and lower 25% quartile values (n=352) for each of the performance variables listed in the table. These variables were compared against the VEPT scores to determine the quartiles.

TABLE 3.

	BA.	SLG	SO%
Average	Upper	Upper	Upper
Quartiles	.272	.398	.250
	Lower	Lower	Lower
	.250	.381	.260

Table 3 presents the upper and lower 10% quartiles for three of the six batting performance variables (batting average, slugging percentage, and strikeout percentage).

RESULTS

Table 1 illustrates the range, mean, minimum and maximum values, standard deviation, and variance for all 352 players' final VEPT scores as well as each of the 6 batting performance variables. All values in Table 1 for VEPT and the batting performance variable average all of the 352 subjects' scores together prior to creating the quartiles.

The results of the study used descriptive statistics to analyze the players' performance based solely on their visual skills. Each player was divided into quartiles depending on their comprehensive VEPT score. The batting performance variables were then compared to the upper and lower 25% and 10% quartiles for VEPT. Through statistical analysis, it was indicated that a significant difference was found for the upper and lower 25% quartiles (table 2) for BA (.268 to .253), SO% (.216 to .248), OBP (.334 to .283), and OPS (.713 to .667).

Table 3 indicates the comparison for the upper and lower 10% of VEPT scores, where greater disparities were found for BA (.272 to .250), SO% (.226 to .260), and SLG (.398 to .381).

Practical Application

The results of the study provide evidence that superior visual skills are indicative of superior batting performance in several statistical categories including BA, SO%, OBP, and OPS. Since visual skills appear to play a significant role in batting performance, coaches, trainers, and administrators should consider using programs such as VEPT to assess baseball players.

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DESIGN AND DEVELOPMENT OF A SEMI-AUTONOMOUS FIXED-WING AIRCRAFT WITH REAL-TIME VIDEO FEED

by CODY TORNO[†]
AND LUIS RODOLFO GARCÍA CARRILLO



ABSTRACT

In recent years, the understanding and development of Unmanned Aircraft Systems (UAS) has grown exponentially. With technological advancements in the fields of integrated circuits and battery polymers, it is now possible to produce UAS that can provide benefits far outside their initial military purposes. Despite this, there are still very few developed UAS that can exploit such technological advancements. Several large scale vehicles (>4 m) utilize gas propeller-driven systems, which enables long-endurance flights and applications of reconnaissance, surveying, and high-altitude sensor testing. Unfortunately, these are exponentially

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C. Torno and L.R. García Carrillo are with the Unmanned Systems Laboratory, School of Engineering and Computing Sciences, Texas A&M University-Corpus Christi, Corpus Christi, TX 78412 USA.
e-mail: {ctorno}@islander.tamucc.edu, L.R. García Carrillo e-mail: luis.garcia@tamucc.edu.

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expensive to purchase, maintain, and operate. On the other hand, there are mini-UAS (m-UAS) in production; most of them are focused on copter designs for study of stabilization and path planning software. Mini-UAS are a viable option for low endurance, altitude, and payload objectives due to battery limitations and constant adjustment of thrust for directional stabilization and maneuvering. The research presented here focuses on the design and development of a fixed-wing aircraft that serves as a viable option between UAS and m-UAS platforms with the purpose of merging the strengths of both systems into a low-cost, highversatility vehicle. The proposed UAS considers low-level autopilot capabilities for stabilized flight, with a minimum flight time of 60 minutes and 60 Km distance. Additionally, a 3-axis gimbal stabilized camera system is designed and implemented to produce steady video stream to a ground control station.

Keywords: Unmanned Aircraft Systems, Dynamic Model, Low-level autopilot

I. INTRODUCTION

In recent years, Unmanned Aircraft Systems (UAS) or Remotely Piloted Vehicles (RPVs) have developed far past their initial applications in military settings. This is due to the large influx of new technological advancements, making these vehicles less expensive and more reliable than their manned predecessors [1]. A UAS has several

FIGURE 1.
Fixed-Wing UAS



TABLE 1.
UAS Categories Defined by the Department of Defense

UAS Category	Max Gross Takeoff Weight	Normal Operating Altitude (ft)	Airspeed
Group 1	< 20 pounds	<1200 AGL	<100 knots
Group 2	21 - 55 pounds	<3500 AGL	<250 knots
Group 3	<1320 pounds	<18,000 MSL	
Group 4	>1320 pounds		Any Airspeed
Group 5		>18,000 MSL	

characteristics that provide benefits over traditional manned aircraft. With the manned flight systems removed from the cockpit and replaced with light weight on-board computer systems, the vehicle does not experience any major design constraints. UAS can take the form of fixed-wing, rotary-wing, or **lighter-than-air** vehicles that can range in sizes from 0.1 m to 15 m [2]. A fixed-wing UAS platform has a large advantage over similar manned aircraft due to its ability to offer long flight durations and superior flight altitudes with less acoustic propulsion systems, avoiding visual and radar detection [2] [1]. UAS have many applications that include governmental uses in intelligence gathering, surveillance, and reconnaissance (ISR) and homeland security [3]. The civil sector is greatly interested in the platforms with potential to be utilized for geo-location or surveying, assessment of natural disasters, research and testing platforms, academia, as well as several applications in land management, commercial, and earth science studies [4]. The main disadvantages of these platforms are the logistical footprint made due to

the requirement of Launch and Recovery Systems (LRS). LRS require a large ground crew to facilitate proper operations and can involve costly launch mechanisms to facilitate initial flight speed, such as runways or pneumatic catapults [2].

The U.S. Department of Defense (DoD) currently categorizes **RPAs** into five groups which can be seen in Table I. It has been identified by the Department of Commerce that Group 1 will dominate civil-use UAS markets due to their low operating altitude, commercialization potential, and low logistical footprint. However, as of 2010, the majority of commercialized vehicles fall outside of this category [5]. As the FAA moves towards UAS-tolerant policies, the integration and development of this UAS category in NAS will greatly expand civil interest.

There are several limitations of conventional platforms that provide reason for development of alternative solutions. Most fixed-wing UAS in operation have large wingspans and use gas power **plants** for propeller-driven propulsion. Although these systems allow for long-endurance flights and large application basis, they usually fly at altitudes and speeds that limit their applications in the civil sector. In addition, these platforms are also exponentially expensive to purchase, maintain, and operate, limiting the payback potential of the system in civil use [5]. The most important limitation is the required logistics that go into these larger UAS flights.

In order to provide an alternative platform for the growing interest of the civil sector and higher education institutions, the present research presents the development of a fixed-wing platform adhering to the current and future FAA restrictions on UAS handling and operations. There are several objectives for this platform which range from aerodynamic capabilities to payload characteristics. The proposed UAS will provide real-time video feed for use in the assessment of platform potential and design flaws. The platform will have the capability **of** maintain level flight with payloads as large as 3 kg, while operating using an all-electric propulsion system. The electrical power system is designed to optimize the battery life of the UAS, increasing endurance to over 60 minutes. The payload system is composed of a three axis gimbal stabilized

GoPro 3 Hero® camera, allowing for a high-definition video transmission.

The organization of this manuscript is as follows. Section II presents the available commercial and research-based platforms similar to that proposed in this manuscript. Section III discusses the RPV platform design in detail, including aerodynamic simulation of wing components. Section IV provides a detailed dynamic model of the RPV platform in regards to pitch, roll, and yaw dynamic movements. Section V develops the understanding of gimbal assisted real-time video and potential of system. Section VI demonstrates the experimental platform and the details of the components required for experimental flight. Finally, some conclusions are presented in Section VII.

II. RELATED WORK

A. Commercially Available Platforms

Several commercially available platforms are available for purchase with autonomous flight capabilities. AeroVironment [13] has several Group 1 classification UAS platforms that were initially developed for the military. However, they have recently been awarded a *restricted category* rating from the FAA to allow for commercial purposes. The RQ-20A Puma AE (all environment) has a wingspan of 2.8 m with an overall weight of 6 kg and endurance of 3.5 hours. The payload is gimballed, housing an electro-optic and **inferred** camera system. The fuselage is completely waterproof, quickly hand launched, and has autonomous landing capabilities. Another AeroVironment UAS platform of smaller size is the RQ-11B Raven [13]. It is the most widely used UAS in the world. The platform has the same gimballed payload as the Puma, however its wingspan of 1.4 m and 60 min flight time are significantly less. The costs of these systems are upwards of \$250,000 and are far out of the reach of most civil and research institutions.

Another commercial UAS system that has similar flight characteristics of the proposed platform is the Marcus Zephyr 2 [14]. It is a flying wing configuration with a **wing span** of 1.4 m and endurance of 60 min. The cost of this vehicle is significantly cheaper than the military grade AeroVironment platforms at \$13,000. However, this platform provides limited payload alternations

and requires extensive post processing to calculate the point and location of imagery due to stationary payload systems [14].

B. Research Developed Platforms

With the development of low-level autopilot systems, it has been possible for low-cost research-based platforms to be developed to study various aspects of flight and system control. Many of the platforms being used are retrofitted R/C planes or in-house designed flying wing designs [6]. Both of these provide minimal payload bays and reduce the versatility of the vehicle to system control and stability algorithm testing [7] [21] [6].

III. DESIGN OF RPV PLATFORM

A. Design of the General Structure

The primary mission of the proposed fixed-wing system is to provide a semi-autonomous platform with real-time video capabilities for various payload applications. The vehicle will continue to possess the attribute of use for development and study of low-level autopilot systems in low Reynolds number flight environments for future studies. The first step in the platform design was to establish the design constraints based on the mission criteria. Since this platform is proposed as a versatile payload platform, it is critical that the aircraft produce enough lift to support all systems including a range of optional payload systems for future studies. The fuselage must be hollow in design and accommodate all flight hardware, video system, and numerous payload configurations. The platform must have the ability to cruise at altitudes of >100 m at speeds between 15 m/s and 20 m/s for optimum video feed stabilization and transmission [4].

The **wing-span** of the vehicle must not exceed 2.5 m to allow for ease of transportation. The fuselage and wings connections must be dynamic to accommodate changes in center of gravity (CG) due to user payload preference. After initial designs it was determined that the fixed-wing RPV would have two sections: (i) the main wing/fuselage, and (ii) an anhedral V-tail connected by twin booms. This design can be seen in Figure 2. The RPV will be made entirely out of expanded polypropylene (EPP) with a 22 gauge aluminum inlay for structural support of the fuselage and components.

FIGURE 2.

The fuselage/payload platform design. A three axis gimbal stabilized GoPro 3 Hero® camera, allowing for a high definition video transmission is shown.



B. Design of the Wings and Flaperions

In order to be capable of flight and provide the flight characteristics of interest, several design issues had to be overcome. The first was the wing span for the main wing, which must be capable of providing enough lift for flight with the desired payload size while remaining rigid enough to maintain lift characteristics when external forces such as gusting winds are applied. This wing was determined to resemble those of gliders planes, which have high wing area to payload weight ratios [7]. In gliders, this ratio is critical due to them lacking propulsion and the need to maintain high lift to increase flight times. However, this ratio can be utilized to minimize the power consumption by the motor by needing majority of the motor's power to achieve altitude rather than maintain flight. The flight characteristics and lift of a wing is dependent on the airfoil design used. For this airframe's application, it is important that the airfoil design has a very high lift-to-drag ratio with a small thickness-chord length ratio for reducing pressures during climbs [7]. The total lift requirement for the wing is dependent on the all up weight of the aircraft. The base weight, avionics, payload, and airframe weight specifications can be seen in Table II.

During the development of an aerial vehicle, the aerodynamic properties of the vehicle are important aspects of the design. Since the all up weight of the design has been identified, it is possible to obtain the lift coefficient. It was calculated that at cruising

TABLE 2. Platform Components Weight

Avionics & Payload		Aircraft	
Component	Weight (kg)	Component	Weight (kg)
Ardupilot	0.023	EPP Foam	0.300
Gimbal System	0.250	Fuselage Alloy	0.150
GoPro® Hero 3	0.090	Spars	0.170
RC Receiver	0.040	Brushless Motor	0.180
Speed Control	0.033	Propeller	0.050
Video Transmitter	0.040	Glue/Hardware	0.050
Servo X 5	0.036		
Batteries	0.800		
Total	1.312	Total	0.900
	Total	Total	2.212

TABLE 3. XFLR-5 Analysis Results

Design	1	2	3	4
Airfoil	USNPS	USNPS	E214	E214
Dihedral	0°	5°	0°	5°
Wing Span(mm)	2500	2500	2500	2500
Wing Area (cm ²)	5530	5530	5530	0.150
CG (mm)	230	230	230	230
Velocity (m/s)	11.2	11.3	11.5	11.6
C _L	0.5115	0.4971	0.4820	0.4698
C _L / C _D	82.86	65.50	74.68	68.28
Stall Angle (α)	14.6	14.6	12.6	12.6

speed, the lift coefficient for an all up weight of 2.212 kg would be 0.289. This low lift coefficient shows that there is significant lift to maintain this platform. The lift coefficient also plays a large role in the power requirements of the airframe during flight when related to the drag coefficient. As this ratio increases, the flight and efficiency capabilities of the airframe are linearly increased. Since the vehicle will be flying at a height of around 100 m, we can assume atmospheric density values at sea level with low Reynolds numbers.

An important aerodynamic term to understand during development of results and deliverables is the angle of attack (α) [8], referring to the pitch angle that the airframe is experiencing with respect to the earth frame.

FIGURE 3.
XFLR-5 Analysis of Platform Iso View

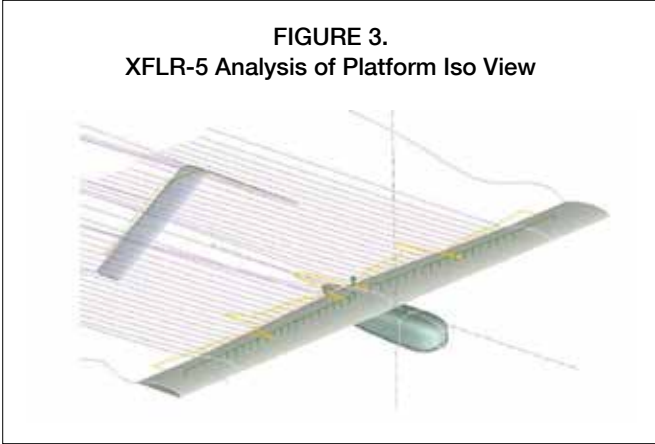
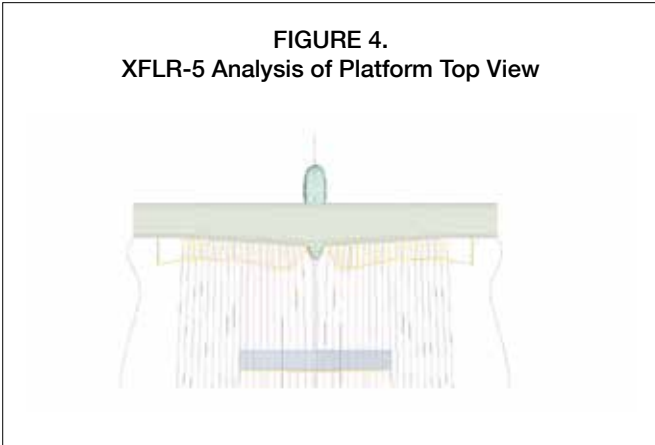


FIGURE 4.
XFLR-5 Analysis of Platform Top View

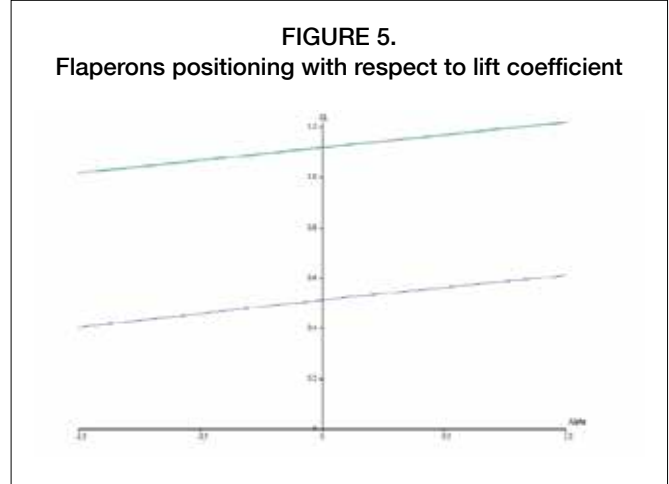


The angle of attack is zero during stable flight at desired altitude, and refers to the vehicle not pitching up or down to change flight height. During launch/landing stages, the angle of attack is increased or decreased to reach desired altitude [9].

Using a wind tunnel flight simulation software called XFLR-5 [10], it is possible to simulate initial aerodynamic properties of airframes. The software makes it possible to conduct preliminary evaluations on several airfoil and platform designs to gain perspective on possible flight characteristics. XFLR-5 software runs foil and platform analysis based on lifting line theory and vortex lattice method [10], [4]. The resulting airfoil aerodynamic data for four conceptual platform designs were evaluated and the aerodynamic properties obtained can be seen in Table III.

Due to the manufacturing and equipment limitations, the airfoils of interest were the USNPS-4 and E214. These airfoils had relatively flat bottoms and allow for increased accuracy in replication to increase platform

FIGURE 5.
Flaperons positioning with respect to lift coefficient



symmetry. In all designs considered, the wingspan was at the max constraint of 2.5 m which allowed for analysis of airfoil and wing dihedral effects on aircraft performance. It was seen that as the dihedral angle of the main wing was increased in design 2 and design 4, the lift properties and cruising speeds were reduced to some degree. This can be expected due to dihedral angles reducing the lift-producing **wing span** area. However, it provides an advantage of roll stability. After consideration of the designs, the USNPS-4 airfoil was chosen for the platform due to its low drag at cruising altitude, which greatly increased its lift/drag ratio.

The analysis using XFLR-5 can be seen in Figure 3. This program allowed for initial development of platform, but for accuracy, data will also be gathered using wind tunnel analysis. The addition of flaperons to the main wing were determined valuable based on the desire to decrease the velocity at two important sections of the flight path, at cruising altitude and during landing. This would allow for slower flight over target and minimize damage done during landing. XFLR-5 analysis of a 15° deflection in flaperons produced 50% increase in lift coefficient C_L and a 30% decrease in velocity [5].

IV. DYNAMIC MODEL OF RPV PLATFORM

The equations of motion for conventional fixed-wing aircraft can be derived by accounting for rigid-body kinematics, propulsion, gravitational, and aerodynamic forces. These non-linear and coupled equations can be linearized using first-order Taylor series expansion to identify the aircraft dynamics. The equations of

motion are taken in the body axis reference frame of the aircraft and assumes a flat Earth coordinate system. The rigid body dynamics consists of the inertial positions $[X, Y, Z]$, body-axis velocities $[u, v, w]$, attitude angles $[\phi, \theta, \psi]$ and body-axis angular rates $[p, q, r]$. The platform description presented in this manuscript represents a simplified model of the actual vehicle.

The dynamic equations are linearized with the assumption of steady equilibrium flight conditions with throttle remaining constant. These 6 Degrees of Freedom (DOF) rigid-body forces and moments in the body frame are defined as τ_{RB} and is split into its force equations f_o^b and m_o^b .

$$\tau_{RB} = \begin{bmatrix} f_o^b \\ m_o^b \end{bmatrix} = \begin{bmatrix} X \\ Y \\ Z \\ L \\ M \\ N \end{bmatrix} = \begin{bmatrix} \text{forward force} \\ \text{sideway force} \\ \text{vertical force} \\ \text{roll moment} \\ \text{pitch moment} \\ \text{yaw moment} \end{bmatrix} \quad 1$$

These forces and moments are the sum of aerodynamic, gravitational, and actuated forces and moments [1]. The system of equations can be broken down into component form.

$$\begin{bmatrix} X \\ Y \\ Z \\ L \\ M \\ N \end{bmatrix} = \begin{bmatrix} m(U - VR + WQ) \\ m(V - UR + WP) \\ m(W - UQ + VP) \\ I_{xx}P - I_{xz}R - I_{xz}PQ + (I_{zz} - I_{yy})RQ \\ I_{yy}\dot{Q} + (I_{xx} - I_{zz})PR + I_{xz}(P^2 - R^2) \\ I_{zz}R - I_{xz}P - I_{xz}QR + (I_{yy} - I_{xx})PQ \end{bmatrix} \quad 2$$

The components in (2) form a set of six nonlinear differential equations with six unknown variables (U, V, W, P, Q, R) [11]. Each of these variables are represented dependently with these nonlinear equations of motion. The total solution for the system of equations can be obtained only by applying numerical integration to all equations for each given time step. The forces that act on the platform can be expanded to represent the aerodynamic forces due to (F_A), thrust (F_T), and gravity (mg). The moments acting on the aircraft are generated from aerodynamic and thrust forces with respect to the aircraft CG. These expanded terms are shown below.

$$\begin{bmatrix} X \\ Y \\ Z \\ L \\ M \\ N \end{bmatrix} = \begin{bmatrix} mg \sin \Theta + F_{A_x} + F_{T_x} \\ -mg \cos \Theta \sin \Phi + F_{A_y} + F_{T_y} \\ -mg \cos \Theta \cos \Phi + F_{A_z} + F_{T_z} \\ L_A + L_T \\ M_A + M_T \\ N_A + N_T \end{bmatrix} \quad 3$$

A. Aerodynamics

Aerodynamic forces are one of the major forces applied to an aircraft. They create moments that affect flight dynamics heavily. Aerodynamic forces are composed of lift, drag, and side force, which generate moments with respect to the CG about X, Y, and Z axis. The aerodynamic forces can be related by their dimensionless coefficients. These coefficients can be found theoretically, or experimentally via wind tunnel testing. Specifically, they are found by multiplying the coefficients with the reference area S (m^2) and the dynamic pressure q (N/m^2) from Bernoulli's theorem for streamlined flow where ρ is the air density. The aerodynamic forces can then be written as:

$$q = \frac{1}{2} \rho V_T^2 \quad 4$$

$$\begin{bmatrix} -X \\ Y \\ -Z \\ L \\ M \\ N \end{bmatrix}_{WIND} = \begin{bmatrix} qSC_D \\ qSC_Y \\ qSC_L \\ qSbC_l \\ qScC_M \\ qSbC_N \end{bmatrix} \quad 5$$

These coefficients are heavily impacted by the aircraft shape, airflow angles, angular rates, and control settings. The platform presented here has a 30° anhedral V-tail without rudder controls. The control derivatives are therefore identified as ailerons ($C\delta_a$), flaps ($C\delta_f$), elevator ($C\delta_e$) and thrust ($C\delta_T$). The building up of the aerodynamic forces and moments as a sum of contributing components provides a convenient way of representation for a specified flight condition. They are associated with the stability and control derivatives in terms of independent parameters.

$$\begin{bmatrix} -\dot{X} \\ -\dot{Y} \\ -\dot{Z} \\ L \\ M \\ N \end{bmatrix} = q \begin{bmatrix} C_{L\alpha} + C_{L\alpha} \alpha + C_{L\dot{\alpha}} \frac{q\dot{\alpha}}{2V_T} + C_{L\dot{\alpha}} \frac{\dot{\alpha}\bar{c}}{2V_T} \dot{\alpha} + C_{L\delta_e} \delta_e \\ C_{D\alpha} + \frac{(C_L - C_{L\alpha})^2}{\pi e AR} + C_{D\delta} \delta \\ C_{Y\beta} \beta + C_{Y\dot{\beta}} \frac{p\dot{\beta}}{2V_T} \\ b(C_{l\beta} \beta + C_{l\dot{\beta}} \frac{p\dot{\beta}}{2V_T} + C_{l\dot{\gamma}} \frac{r\dot{\gamma}}{2V_T} + C_{l\delta_a} \delta_a) \\ \bar{e}(C_{M\alpha} + C_{M\alpha} \alpha + C_{M\dot{\alpha}} \frac{q\dot{\alpha}}{2V_T} + C_{M\dot{\alpha}} \frac{q\dot{\alpha}}{2V_T} + C_{M\delta_e} \delta_e) \\ b(C_{N\beta} \beta + C_{N\dot{\beta}} \frac{p\dot{\beta}}{2V_T} + C_{N\dot{\gamma}} \frac{r\dot{\gamma}}{2V_T} + C_{N\delta_a} \delta_a) \end{bmatrix} \quad 6$$

These stability and control derivatives determine the aerodynamic characteristics of the platform presented. They can be estimated or identified through wind tunnel testing and flight data.

The kinematic equations are represented as shown in equation (7), with control of yaw motion not considered due to the geometry of tail. The stabilization of roll, pitch, roll rate, and pitch rate will ensure stability in yaw.

$$\begin{bmatrix} \dot{\phi} \\ \dot{\theta} \end{bmatrix} = \begin{bmatrix} p + \tan \theta (q \sin \phi + r \cos \phi) \\ q \cos \phi - r \sin \phi \end{bmatrix} \quad 7$$

The coefficients in attitude update equations are listed below.

$$c_1 = \frac{(I_{yy} - I_{zz})I_{zz} - I_{xz}^2}{I_{xx}I_{zz} - I_{xz}^2} \quad 8$$

$$c_2 = \frac{(I_{xx} - I_{yy} + I_{zz})I_{xz}}{I_{xx}I_{zz} - I_{xz}^2} \quad 9$$

$$c_3 = \frac{I_{zz}}{I_{xx}I_{zz} - I_{xz}^2} \quad 10$$

$$c_4 = \frac{I_{xz}}{I_{xx}I_{zz} - I_{xz}^2} \quad 11$$

$$c_5 = \frac{I_{zz} - I_{xx}}{I_{yy}} \quad 12$$

$$c_6 = \frac{I_{xz}}{I_{yy}} \quad 13$$

$$c_7 = \frac{1}{I_{yy}} \quad 14$$

$$c_8 = \frac{(I_{xx} - I_{yy})I_{xz} - I_{xz}^2}{I_{xx}I_{zz} - I_{xz}^2} \quad 15$$

$$c_9 = \frac{I_{xz}}{I_{xx}I_{zz} - I_{xz}^2} \quad 16$$

The aircraft being modeled can then be represented in Appendix (1) in the wind-axes after small angle approximations. The coefficient for free stream airspeed is V_T , the angle of attack is α , the sideslip angle is β , D represents the drag force, L the lift force, Y the side force, F_T the thrust force produced by the engine, and Z_{TP} the offset from the CG in the body-frame z-direction. It is assumed that the airspeed V_T remains constant as it varies much slower than other system states.

V. REAL-TIME VIDEO SYSTEM

The video system was designed to serve as a benchmark test of gimbal operations and control. The main expectation for the system is to have 360° degree viewing angle and autonomous stabilization to compensate for change in vehicle orientation based on all three axes. Since the RPV is designated for several applications, it is expected that the camera system will allow for different camera types. The camera system must be rugged and capable of withstanding damage during testing. As shown in Figure 6, the camera gimbal apparatus has been designed to be easily 3D printed to exact specifications and can easily be replaced.

The material is made of high density plastic and has three 2208 KV80 brushless gimbal motors to power orientation stabilization. The stabilization software is stored on a Quantum AlexMos brushless gimbal controller that receives input from the Ardupilot® and user input. This allows the ground control station to manually operate and maneuver the video system during stabilization to focus on different geographical locations. This system was chosen for its potential to be utilized for geo-lock and tracking applications, with the integration and coordination of the autopilot and video system to alter flight path to allow continuous monitoring of points of interest.

VI. THE EXPERIMENTAL PLATFORM

At this time, the experimental platform and its components are still being manufactured and assembled. The sections below show the progress of the experimental platform build at time of manuscript.

A. Airframe

The experimental platform has a **wing span** of 3.0 meters but could be reduced to 2.5 meters to reduce

FIGURE 6.
3D printed camera gimbal apparatus

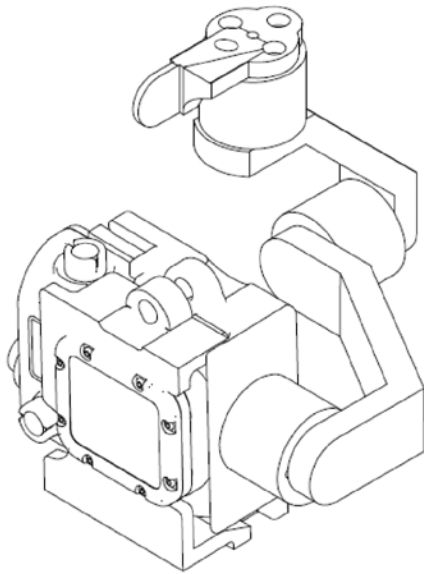


FIGURE 7.
Completed Airframe



wing flexure. The fuselage is 0.5 m in length with front cone and motor connector, and will have a complete length of 0.65 m. It can be seen from Fig. 7 that the fuselage is made of basswood and depron foam. The total vehicle weight is 4 kg which includes all components.

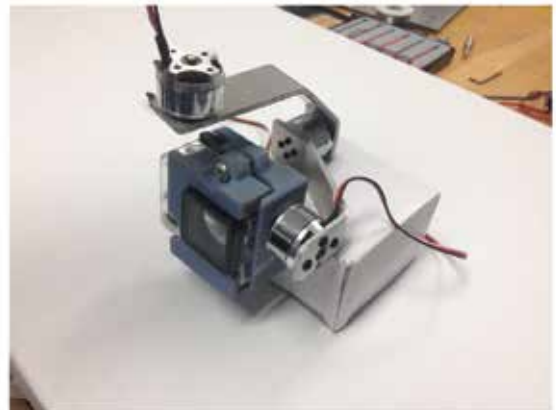
B. Ground Station

The ground station for the platform was developed using two Dell 1907FPVt monitors and Dell desktop computer that were disassembled to fit inside a weather-proof housing with dimensions of 0.914 x 0.33 x 0.152

FIGURE 8.
Ground Station Computer



FIGURE 9.
3D printed camera gimbal apparatus.



m (Fig. 8). This allows the ground components to be completely portable and resistant to the elements. One of the screens will be devoted to the ground station software while the other is reserved for payload and telemetry data. The communication system from the ground station to the airframe will be an omnidirectional antenna that will allow for video reception for up to 5 km.

C. Payload

The payload system can be seen in Fig. 9. During the development it was determined that it was critical to keep the camera protected within its case. This added weight and increased the weight of the payload to 0.275 kg due to this adaptation, but its durability was greatly increased.

VII. CONCLUSIONS

The design of a high-versatility, low-cost fixed-wing UAS for use in the academic and future civil applications provides several design and cost challenges. It is important that the reliability of the vehicle is not compromised due to the materials and software used. Future work will be devoted to the simulation and testing of the UAS and lowlevel autopilot software. The control system structure and design will be developed in order to accurately respond to the aircrafts on-board altitude sensors. After the completion of the airframe and ground station, experimental testing will be conducted along with wind tunnel testing to provide comparison to simulations.

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APPENDIX

$$\begin{bmatrix} \dot{\alpha} \\ \dot{\beta} \\ \dot{p} \\ \dot{q} \\ \dot{r} \end{bmatrix} = \begin{bmatrix} q - (p \cos \alpha + r \sin \alpha) \tan \beta - \frac{1}{mV_T \cos \beta} (L + F_T \sin \alpha - mg(\sin \alpha \sin \theta + \cos \theta \cos \phi \cos \theta)) \\ p \sin \alpha - r \cos \alpha + \frac{1}{mV_T} (Y - F_T \cos \alpha \sin \beta + mg(\cos \alpha \sin \beta \sin \theta + \cos \beta \sin \phi \cos \theta - \sin \alpha \sin \beta \cos \phi \cos \theta)) \\ c_1 r q + c_2 p q + c_3 \bar{L} + c_4 N \\ c_5 q r - c_6 p^2 + c_6 r^2 + c_7 M + c - 7 F_T Z_T p \\ c_8 p q - c_2 r q + c_4 \bar{L} + c_9 N \end{bmatrix}$$

RECOGNIZING HIDDEN AND IMPERILED CORAL REEF FISH BIODIVERSITY IN THE CORAL TRIANGLE

by SAMANTHA VALDEZ, LUKE TORNABENE,
MARK ERDMANN, FRANK PEZOLD

ABSTRACT

Previous research has shown that the Coral Triangle, a biodiversity hotspot located in the tropical Western Pacific Ocean, is a center of speciation for a variety of marine organisms. However, many “species” living on coral reefs in this region actually contain multiple, genetically distinct cryptic species that differ from each other either in color differences or slight morphological traits. The genus of reef fish known as dwarf gobies (*Eviota*) are excellent candidates for studying these species containing cryptic lineages because of their abundance in the Coral Triangle, fast generation time, and low dispersal capabilities. DNA sequence data from two different genetic markers, one mitochondrial gene and one nuclear gene, were used in conjunction with morphological data to test for the presence of newly discovered cryptic species within this group. Preliminary results from our analysis suggest that 41% of *Eviota* species

represent undescribed cryptic lineages, many of which are endemic to small isolated areas within the Coral Triangle. Being endemic to a small region poses a problem with undescribed cryptic species. Climate change and overfishing pose a threat to their habitat, and without describing them, we face the risk of species going extinct before their existence is known to science. Thus, our research highlights the importance of describing and naming these species in order to identify, preserve, and manage the biodiversity within the Coral Triangle.

INTRODUCTION

The Coral Triangle (CT), located in the tropical Western Pacific, is considered to be one of the most diverse regions on the planet for marine species (Briggs, 2005). The CT spans Indonesia, Malaysia, the Philippines, Brunei, Papua New Guinea, and the Solomon Islands (Carpenter et al., 2011). This biodiversity hotspot is an origin for speciation in multiple groups including starfish (Barber et al., 2006), giant clams (Nuryanto & Kochzius, 2009), and snapping shrimp (Hoeksema, 2007). Reef fish are also exceptionally diverse in the CT (Allen & Erdman, 2012), although it remains to be seen whether the CT is actively producing new fish species at elevated rates, or whether it is simply an area of overlap between the diverse faunas of the Indian and Pacific Oceans (Carpenter et al., 2011).

MENTOR

Dr.??

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There are many species of fishes distributed throughout the Indian and Pacific Oceans, well beyond the Coral Triangle (Allen & Erdmann, 2012). However, many of these “species” actually represent complexes of multiple, genetically distinct cryptic species that differ from each other either in subtle morphological traits or in color pattern. In most cases, these undescribed cryptic species have considerably smaller range sizes than the entire species complex itself, and thus, some species may be endemic or exclusive to certain islands or island groups (Greenfield & Tornabene, 2014; Tornabene et al., in press). That being said, climate change, overfishing, and habitat loss have all been major drivers in the worldwide decline of coral reefs. These rapid **declinations** have caused dramatic changes in fish communities and have even resulted in local extinction (Graham et al., 2011). If these species are endemic to a local region where coral reefs are declining, there is an increased chance that these fishes may become extinct before anyone knows they exist. The goal of our research is to describe this hidden diversity, document species’ habitats and ranges, and provide information critical to their conservation.

Dwarfgobies (Gobiidae: *Eviota*, Figure 1) are small, colorful reef fishes that are among the most diverse genera of fishes in the world (Allen & Erdmann, 2012; Greenfield & Tornabene, 2014; Tornabene et al., in press). Fishes of the genus *Eviota* are primary candidates for studying speciation for multiple reasons. First, these fishes occur throughout the Indo-Pacific region and are numerically abundant throughout their range (Ahmadi et al., 2012; Depczynski & Bellwood, 2003). These fishes also have a high mortality rate but extremely fast generation times, allowing them to quickly evolve and adapt to ecological changes or genetic isolation (Depczynski & Bellwood, 2005, 2006). Dwarfgobies also have very limited dispersal rates due to the spawning of benthic eggs on the reefs and larval behavior. Once larvae hatch they must constantly feed and not stray from the corals (Sunobe & Nakazono, 1987). Another attribute contributing to their diversity is their ability to change their habitats from coral to sand or rubble over their evolutionary history (Tornabene et al., 2013). As a result of their limited dispersal, ecological flexibility, and high potential for speciation, *Eviota* fishes are exceptionally diverse and comprise at least 90 valid species.

FIGURE 1.
Live photographs of *Eviota* fishes taken by Mark Erdmann in the Coral Triangle, A) *E. atriventris*, B) *E. dorsopurpurea*, C) *E. sebreei*, and D) *E. pamae*



The goal of this project is to shed light on the cryptic biodiversity occurring in the Coral Triangle by combining morphological and molecular approaches. In our research, we use DNA sequencing to sample *Eviota* throughout their range to determine whether or not a species contains one or more cryptic species. If there is evidence of a cryptic species, we then search for key diagnostic features that allow us to identify similar species based on subtle morphology and coloration. We also need to determine the area in which these cryptic species reside. This type of taxonomic research is the foundation for biodiversity conservation. The most fundamental measure of biodiversity is the number of species in a given area; without knowing if a species exists, where they exist, or how to tell them apart, we are not able to accurately preserve or manage a species. For this reason, our project focuses on the most diverse region on the planet, the Coral Triangle. Furthermore, if we observe reoccurring patterns of species distributions and endemism in *Eviota*, we can then begin to look for similar patterns in other fishes and marine organisms.

MATERIALS/METHODS

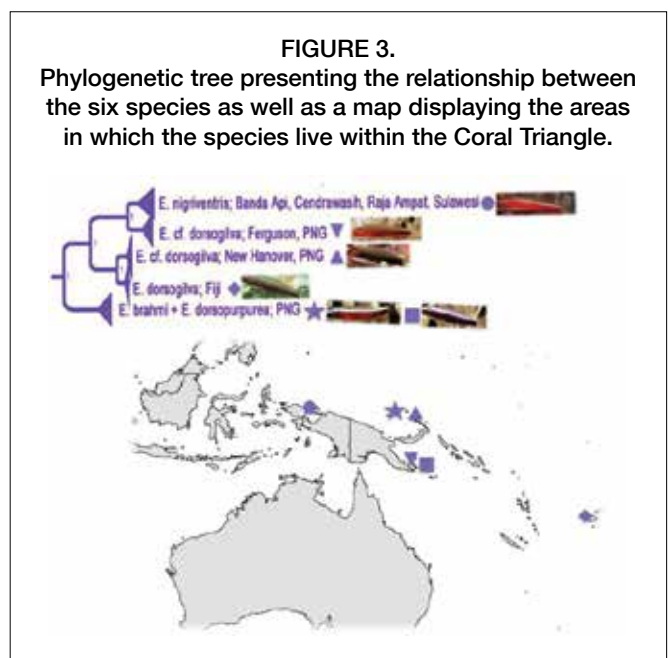
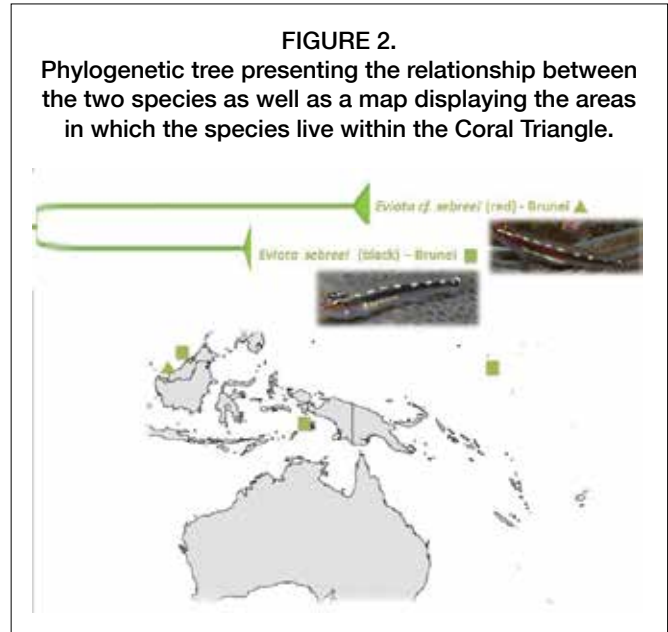
Specimens were collected and photographed from reefs around the Coral Triangle and the greater Indo-Pacific region. We sequenced over 150 samples from 32 putative species. The samples were stored in ethanol and tagged with a specific identification number that will correspond to DNA sequences downstream. DNA was extracted from a fin clip using a Qiagen DNeasy Blood and Tissue Kit (Qiagen, Velancia, California). The extracted DNA was then stored in a -20°C freezer for PCR.

PCR was conducted using primers specific for fish and goby DNA fragments. We sequenced both nuclear (protease III) and mitochondrial (cytochrome c oxidase subunit I) DNA to determine phylogenetic relationships of our samples. The mitochondrial marker was selected to provide information on recent mutations that occurred between closely related species, while the nuclear marker was able to show more slowly evolving mutations that occurred between distantly related species. PCR products were sequenced by Beckman Coulter Genomics (Danvers, Massachusetts). An electronic chromatogram of each DNA sequence was visualized, edited, and aligned across species in the software package Geneious v. 6.0.6. Once aligned, the mitochondrial and nuclear datasets were combined and analyzed in the program MrBayes v. 3.2 to create a phylogenetic tree. MrBayes software combines Bayesian statistical theorem with maximum likelihood models of DNA evolution to determine the phylogenetic tree with the highest posterior probability. The trees produced were then evaluated to see whether each of our 32 species showed evidence of being a single species (possessing only one cluster, or clade) or comprised multiple cryptic species (possessing two or more clusters or clades). If there was evidence of multiple species, specimens and photographs from each clade were examined to search for key features useful for distinguishing each genetic group. We then plotted the distributions of each cryptic species on a map to identify taxa that were endemic to specific islands or regions.

RESULTS

Our preliminary assessments identified 32 species; however, five of these species possessed one or more cryptic species. In total, our tree contains 22 genetic lineages that may represent undescribed species.

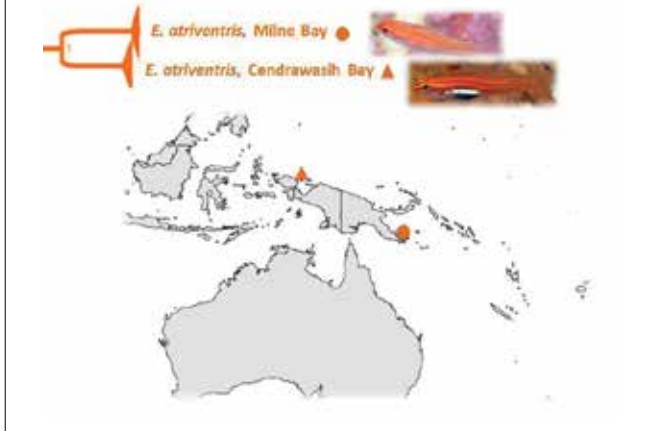
Eviota sebreei is one example of a species containing a cryptic species. In the wild, there are two distinct color morphs: a black morph known from several localities throughout the Coral Triangle, and a red morph that co-occurs with the black morph in Brunei (Figure 2). Prior to this study these color variants were thought to be the same species. However, our results show that the two color morphs are genetically distinct and represent two different species, despite individuals from each color morph living on neighboring coral heads.



Prior to 2011, *Eviota nigriventris* was thought to be one species; however, our study shows there are a total of six distinct lineages throughout the Coral Triangle, each with corresponding color morphs (Figure 3). These color morphs occur throughout the Coral Triangle and several of them likely represent new species. Three of the six color morphs have been described as new species in recent years (Greenfield & Randall, 2011; Greenfield & Tornabene, 2014). However, the remaining three represent new species yet to be named. Each species appears to be endemic to a small region or chain of islands.

FIGURE 4.

Phylogenetic tree presenting the relationship between the two species as well as a map displaying the areas in which the species live within the Coral Triangle.



Eviota atriventris is another example of a cryptic species complex. While still thought to be one species, DNA sequencing data shows there are indeed two distinct genetic lineages (Figure 4). One species occurs in Kwatisore, Cenderawasih Bay, Indonesia; this species contains a dark abdomen both in life and in preservation. The other species, found in Lawidi Bay and Milne Bay, has a white abdomen. The Cenderawasih Bay color morph is widespread throughout the CT, but the Milne Bay color morph has only been confirmed from eastern Papua New Guinea and likely has a restricted range.

DISCUSSION

Integrating DNA sequencing data with morphology-based taxonomy provides us with tools that allow us to recognize and acknowledge important cryptic species. Viewing the fish both in the wild (or via live photographs) and in the lab via microscopic examination allows us to identify key features and characteristics that distinguish one species from another once a cryptic species is confirmed through DNA sequencing data. Dwarf gobies represent a great candidate for cryptic diversity because they are small and often overlooked, extremely abundant, widely distributed, have fast generation times, have limited larval dispersal, and adapt quickly to new environments. Our research is important in that describing these species allows us to better preserve the

biodiversity of these fish and allows us to take measures to manage the areas in which the species live.

Our results here demonstrate that the diversity of reef fish is extremely underestimated. Based on our combined molecular and morphological analysis, 41% of the total species of dwarf gobies have yet to be described. Allen and Erdmann (2012) document at least 2,600 total coral reef dwelling fish species within the Coral Triangle. Even when slightly more conservative estimates are applied, there may still be anywhere between 260 (10%) and 1,059 (41%) undescribed species within the CT. Reef fishes, particularly those in the CT, have a high extinction risk due to the fact that some species are endemic to small, isolated island chains. If an island inhabited by an endemic dwarf goby or other reef fishes experienced major habitat loss due to anthropogenic impacts or climate change, the species' entire range would be under threat. Our study demonstrates that Cenderawasih Bay, Milne Bay, Raja Ampat and many other areas within the CT possess endemic species. Thus, it is important to continue this research and to expand taxonomic sampling to other habitats and marine organisms that have major conservation priority.

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THE REPRESENTATION OF LATINAS IN AMERICA'S MOST WATCHED SHOWS

by AMARISSA VERA



ABSTRACT

This research examines the prevalence of and roles played by Latinas in television. Latinas were underrepresented in America's top three most watched shows in 2013. The shows analyzed were The Big Bang Theory, NCIS, and NCIS: Los Angeles. Latinas, while failing to be accurately represented numerically, were also represented in shallow, stereotypical ways. They were represented according to well established tropes, such as the "domestic Latina," "the crazy Latina," and "the sexy Latina." Latinas were even further marginalized, despite their already slight presence in the television shows, by being mostly secondary characters. Of all the Latina characters documented, only one was a primary character. These dismal findings create a cause for concern over the underrepresentation of Latinas and the stereotypical and shallow ways that they are being represented.

STATEMENT OF THE PROBLEM

With television being a powerful socializing agent, it is important to investigate the representation of diverse groups within the medium. While much research has noted the overrepresentation of males and non-Hispanic whites in television programming, less research has focused on minority populations' representation in television. Much of that research, though, focuses on a black-white dichotomy, excluding other minority groups. More research needs to examine the representation of Hispanics, the largest minority population in the United States. Most of the research on Hispanics focused on the portrayal of men and neglects women. This project seeks to investigate the role Hispanic women play in American television.

LITERATURE REVIEW

Almost every American does this, regardless of age, race, or gender. According to the Bureau of Labor Statistics' American Time Use Survey, the average American spends over five hours watching television. In an average lifetime, this amounts to about nine years. Television pervades our culture and has become both a source and a creator of information (U.S. Bureau of Labor Statistics 2013). Americans use television to instill values, change opinions, and socialize. Both adults and children can enjoy it in their leisure time. Television acts as a powerful



MENTOR
Dr. Isabel Araiza

Associate Professor of Sociology
Department of Sociology
College of Liberal Arts

medium that can change the way people think based on what they see. When you tune in to your favorite television show, what do you see? This research will analyze the top three most watched television shows according to the number of viewers. It has already been established that the majority of characters on television shows are white males (Signorielli 2009). However, television character demographics are becoming more diverse. Shows now feature more female protagonists. This is evident in shows such as *New Girl*, *Grey's Anatomy*, *Private Practice*, etc. (Casserly 2013). Shows also include more minorities, such as African Americans and Hispanics (Albert & Jacobs 2008). Nevertheless, despite these trends, these shows lack diversity. White men still make up a majority of television characters in America, despite the fact that white men are not a majority of Americans (Census Bureau 2012). Television not only misrepresents the number of white men but also the number of minorities. Television shows do not represent minorities and women accurately. When minority populations are present, they often lack the depth and complexity found in white male characters (Boylorn 2008). This is alarming because women are a majority of the American population and Hispanics (a minority group) are one of the fastest growing population segments (Census Bureau 2012).

Some of the marginalized groups seemingly forgotten by television are racial/ethnic minorities. Minorities, as defined by Richard T. Schaefer, are a "subordinate group whose members have significantly less control or power over their lives than members of a dominant or majority group" (Schaefer 1998). Though impossible to operationalize, some characteristics of minority groups are their differing physical and cultural traits, which are unlike those of the dominant culture. Unfortunately, being a minority also involves having significantly less power than those who comprise the majority group (Schaefer 1998). Over the past few decades, much has been done in terms of civil rights for minorities, such as helping to ensure equal pay regardless of race and equal hiring opportunities (Mascaro 2005). Notwithstanding, minorities are not equally represented in television today. This is despite the fact that, according to recent U.S. Census data, by the year 2043 the U.S. will have a majority-minority population (Census Bureau 2012). This means that the current majority, white non-

Hispanics, will no longer compose the majority of the population.

One of the fastest growing of these soon-to-be majority-minority groups is Hispanics (Census Bureau 2012). Nevertheless, even though minorities will soon be a majority, they are not represented in significant numbers in America's popular television shows (Coffey 2013). The current demographic, as of the 2012 census survey is 62.8% white, 16.9% Hispanic, 13.1% African American, and 7% other (Asian American, Native American, etc.) (Census Bureau 2012). It has been calculated that by 2050, the U.S. population will be 47% white, 29% Hispanic, 13% African American, and 9% Asian American (Passel & Cohn 2008). This growing trend of minorities, especially Hispanics, the largest minority group, does not show itself in America's top television shows (Albert & Jacobs 2008). Hispanics are vastly underrepresented in popular culture, especially television. Although some attempts have been made to include more minorities, such as African Americans, in popular culture, little effort has been made to incorporate Hispanics (Signorielli 2009).

Minorities are not the only group treated as subordinate with less power. Females are also treated this way. This is rather astonishing, because in both America and the world, females are a numerical majority. In America, as of 2012, according to the U.S. Census Bureau, females are 50.8% of the population (Census Bureau 2012). Despite females being a majority, they are treated as a minority. This treatment can be seen throughout American culture and in our society (Myers 2013). Males are given a place of privilege, and as such, it is mostly males running the government, males running big businesses, and males making, on average, twenty three cents more than their female counterparts (Ahmed & Khalid 2012).

The deprecating view of females as the weaker sex is also seen in popular culture. Women are objectified and sexualized for the enjoyment of a male audience (Ferguson, Munoz, Contreras, & Velasquez 2011). Despite females being a majority, males remain the judge, and television attempts to appeal to a male judge, or a male gaze. Television shows also seek to please and praise males over females. This has resulted in a surplus of male protagonists, as seen in shows like *The Big Bang*

Theory, Breaking Bad, The Walking Dead, House, Wilfred, Sherlock, Dexter, etc. All of these shows focus on the lives of men, which are presented in a variety of forms. This is not true for women in television, who typically appear in only a few select forms, such as the “damsel in distress,” the girlfriend, or the sex object. (Casserly 2013) Being portrayed as a sex object has been shown to have negative effects for women viewers such as having an increased body dissatisfaction (Ferguson, Munoz, Contreras, & Velasquez 2011). Even now, with women having gained more rights and becoming more prominent in both the political and economic spectrums, there is still little variety for women on television. This is another troubling element about women in television.

In many television shows with women, the women are often the victims of violence. Women are most often the victims of violent sexual crimes in both real life and on television (Who Are the Victims-Domestic Violence 2014). This can be seen in such shows as *CSI: Crime Scene Investigation, The Bridge*, and *The Killing* (Crampton 2014). These shows commonly feature dead women who are the victims of horrendous sexual crimes. Their deaths and sexual murders have been used as fodder for the story of the male protagonist. It is up to him to solve these women murders, thus completely neglecting the women as real human beings, instead seeing them only as a story line. Female characters on television are also restricted in their age, which is usually twenty to early thirties. After this age, women seem to disappear from television (Jermyn 2013). Women are also portrayed in a limited number of roles involving jobs. When women do have jobs in television shows, they are most often subordinate jobs, usually with a man as the boss (Myers 2013). Women in the popular media also do very poorly on the Bechdel test. This test identifies what women’s roles in movies and television shows are and what their conversations are about. Unfortunately, most female characters fail the Bechdel test because most female character’s lives revolve around men and stories of men (Nussbaum 2013).

Hispanics are one of the fastest growing minority groups, and women are a majority group (Census Bureau 2012). As of right now, minorities such as Hispanics are often portrayed in stereotypical ways (Signorielli 2009). This is when they are portrayed at all. The same is true

for women. Women are also portrayed in stereotypical ways, such as being hyper-feminine (Casserly M. 2013). However, Hispanics and women are now being portrayed more frequently than before (Albert & Jacobs 2008). But there are still few of them in America’s most popular television shows (Boylorn 2008). Television shows are targeting women and featuring more female characters, but they still lack in featuring more minority characters (Feuer 2014) (Greene 2010).

With women and minorities becoming majorities, there must be a greater presence of these groups in our popular culture. These representations must be wide and varied, not just constricted to a few roles revolving around men. This research will determine if this mission is being undertaken. This research analyzes the presence of Hispanic women in America’s top three most watched television shows. There has been little previous research for Hispanic women, so this research will be relevant and will provide much needed insight into the presence of Hispanic women in America’s popular culture. Furthermore more, little research has been done analyzing Hispanic women in popular culture. This research will provide valuable information on the topic of Latina representation in popular culture.

METHODS

Sample

Shows

The television shows, excluding sports shows, to be analyzed were chosen according to the number of viewers, with the shows with the most viewers being chosen. The shows chosen had the most viewers in their 2012-2013 seasons. The shows were chosen according to lists compiled by Entertainment Weekly and TV Guide formatting (Schneider 2013). Both these companies compiled their lists based on the number of viewers in the 2012-2013 seasons.

The shows chosen were present on both lists, and were the top three most watched. In order of the number of viewers, with the most being listed first, the list is: *NCIS, The Big Bang Theory*, and *NCIS: Los Angeles*.

The table below shows the number of viewers for each television show being analyzed.

TABLE 1.
Number of Viewers

Show	Number of Viewers
1. <i>NCIS</i>	21.6 million
2. <i>The Big Bang Theory</i>	19 million
3. <i>NCIS: Los Angeles</i>	17.5 million

The table below shows the number of episodes and season of each show.

TABLE 2.
Number of Episodes and Season

Show	Number of Episodes	Season
<i>NCIS</i>	24	10
<i>The Big Bang Theory</i>	24	6
<i>NCIS: Los Angeles</i>	24	4

Characters

While I watched the shows, I documented Hispanic women who have a speaking role or are present for at least five seconds in more than one episode to show that they are more than just a background character. I also documented any women, regardless of race, that also met the criteria. In order to determine the race of the character, I used various methods. One included drawing on phenotypic cues—analyzing skin color, facial structure, and name. Others included cultural cues—language and cadence. Some roles self-identified. Once I established the character's race, I then documented their occupation and position (subordinate, non-subordinate).

Materials

- Laptop
- Code sheets
(refer to Appendix A: Code Sheet)

PROCEDURE

First, I watched the 2013 season of the selected shows. While watching, women's characteristics were documented including race, cues for race, occupation, position, examples of their behavior, and whether they were a supporting or main character. A coding sheet was completed for each episode (see Appendix A: Coding Sheet).

Also, an analysis of these characters was made (see Appendix A: Coding Sheet). These findings were composed into a comprehensive table to analyze the prevalence of women identified as either Hispanic or Asian in each episode of each show, the occupation of these women, their position, and whether they were a main or supporting character. A coding sheet was completed for each episode. Data synthesized from the coding sheets is shown in the results section.

RESULTS

Below, in Table 1, the racial/ethnic identity of the actors is presented in each show. The table shows the race of each female character, the percentages according to the show itself, and all the shows combined.

The percentage of Hispanic women (9.01% overall) found in the shows is not representative of the current Hispanic female population. According to the U.S. Census, the overall Hispanic population (male and female) is 16.9%. In both *The Big Bang Theory* and *NCIS*, little to no Hispanic females were present despite Hispanic females representing 16.9% of the population (U.S. Census Bureau). African American women were also underrepresented in America's most watched television shows. African American women made up 7.14% of females in the shows, while in reality they are 13.1% of the total American population. Despite this gross underrepresentation of Hispanics and African Americans, the representation of Asian Americans was fairly accurate with 1.55% of documented characters being Asian. With those of Middle Eastern descent, there was a stark overrepresentation at 10.25%. Excluding white women (72.05%), Middle Eastern women were the next most common race found in America's most watched television shows. Hispanic women, unfortunately, were one of the least common races to be seen.

TABLE 1.
Diversity of Female Characters in Shows (n=322)

Shows	<i>The Big Bang Theory</i> (n)	<i>NCIS</i> (n)	<i>NCIS: Los Angeles</i> (n)	All Shows (n)
Non-Hispanic White	95.65% (88)	59.46% (66)	65.55% (78)	72.05% (232)
African American	4.35% (4)	9.91% (11)	6.72% (8)	7.14% (23)
Hispanic	0% (0)	1.8% 2	22.69% 27*	9.01% 29*
Asian American	0% (0)	2.7% 3	1.68% 2	1.55% 5
Middle Eastern	0% (0)	26.13% 29	3.36% 4	10.25% 33
Total	100% (92)	100% (111)	100% (119)	100% (322)

*For NCIS: Los Angeles, 24 of the Hispanic females documented were the same character.

TABLE 2.
Hispanic Women Characters in Most Watched Television Shows (n=29)

Shows	<i>The Big Bang Theory</i> (n)	<i>NCIS</i> (n)	<i>NCIS: Los Angeles</i> (n)	All Shows (n)
Main Characters	0% (0)	88.89% (24*)	0% (0)	82.76% (24)
Secondary Characters	100% (2)	11.11% (3)	0% (0)	17.24% (5)
Total	100% (2)	100% (27)	0% (0)	100% (29)

*All 24 documentations are of the same character.

To understand the portrayal of Latina women in the media, it is not enough to note their presence (or lack thereof). The types of characters they play are also important. The characters that Hispanic women portrayed, main and secondary characters, were also documented. The findings are presented below.

When viewing the data holistically, the majority of the Hispanic women were main characters. However, it should be noted that all 24 observations for *NCIS: Los Angeles* are of the same main character, which was present in all 24 episodes. Consequently, there is actually only one individual Hispanic female who is a main character. All the rest of the characters are secondary characters, which only appeared once and usually in a single episode. The vast majority of Hispanic females

suffer from very little character development. This is shown in the development of the character, including the character's profession. The findings are presented below, in Table 3.

The Hispanic females present in America's most watched shows were part of the private sphere (wife, mother) or the public sphere. While 24 of the recordings show a Hispanic female being in the public sphere, working as an NCIS special agent, it should be noted that this is only one individual character which was documented 24 different times. Therefore, in actuality, half of the characters (the gang member, politician, and NCIS special agent) were in the public sphere, with non-domestic jobs, while the other half (fiancé, wife, and mother) were in the private sphere. These data presented

TABLE 3.
Occupations of Hispanic Women
in Most Watched Television Shows

<i>NCIS</i>	<i>NCIS: Los Angeles</i>
1 Fiancé	2 Wife/Mother
1 Gang member	1 Politician
	24 NCIS special agent*

*All 24 documentations are of the same character.

provide a limited understanding of the representation of Latinas in television. Content analysis of the major Latina character reveals that the development of the Latinas present in the television shows suffered from being stereotyped into two categories: the “crazy Latina” and the “sexy Latina.”

QUALITATIVE ASSESSMENT

Of the Latinas present in the shows analyzed, there was only one Latina who was a major character. She was documented 24 times; she was present in every show. Due to her being the only major Latina character, she was the only character who was qualitatively assessed. This lack of major Latina characters is further examined in the discussion section.

The Crazy Latina

The show *NCIS: Los Angeles* ranks third in the most watched shows in America. The television show is about the Office of Special Projects based in Los Angeles. This is an elite division of the Naval Criminal Investigative Service that deals mainly with undercover missions. The main Hispanic female character in *NCIS: Los Angeles*, Kensi, is portrayed in stereotypical ways. Although the character appears to defy stereotypes with her career in the public sphere and her portrayal as a main character of the show, she is still seen as lesser than her male counterparts. This is exemplified in one scene in episode one of season four, where she portrays the stereotypical “crazy Latina” to distract a bank teller, while her partner, Marty, extracts needed information.

Marty and Kensi are in the bank, both with different bank tellers.

Female Bank Teller: This is your safety deposit box or...?

Kensi: My husband's.

Female Bank Teller: But you have his signed authorization to access the box?

Kensi: *Lifting her hand to show a wedding ring.* I'm his wife.

Female Bank Teller: I'm sorry but you either need to be designated or have a signed authorization.

Kensi: *With a louder voice and a frustrated look.* Listen honey, he's my husband, okay? What's his mine, what's mine, oh, he's welcome to me because I don't have a damn safety deposit box. Do I?

Camera switches to male bank teller, who is looking at Kensi.

Camera switches to Marty, who is looking at Kensi.

Marty: Morning, I'm Kelvin Attley. And I need to access my safety deposit box please.

While camera focuses on Marty and male bank teller, Kensi can still be seen and heard ranting in the background.

Male Bank Teller: Of course Mr. Attley.

Camera switches back to female bank teller and Kensi.

Female Bank Teller: Now you don't need to raise your voice. I'm sure if you just ask your husband-

Kensi: You want me to talk to my cheating, lying, good for nothing, cheap, two-faced husband? This is what you want? To start world war three?

Female Bank Teller: I'm sorry.

Kensi: *Yelling.* I didn't think so! You're sorry? Okay. You know what? If I can't have access to that box, you're going to open it and tell me how much money he has stashed in it. That's what you're going to do honey.

Camera switches to show Kensi in the foreground, being looked at by male bank teller and Marty.

Female Bank Teller: Even if I was authorized to, which I'm not, it's a two key system and I need your husband's key.

Kensi: You want a key? I'll give you a damn key.

Marty and male bank teller again glance at Kensi. Camera then switches to Marty and male bank teller.

In the above scene, Kensi portrays the crazy Latina through stereotypical behaviors, such as raising her

voice, moving her head and neck in a jerking fashion while talking to the bank teller, making numerous hand gestures, and being very confrontational and unreasonable. Unfortunately, in this very same scene, Kensi is also portrayed as the “sexy Latina.”

The Sexy Latina

While Kensi is often used as bait or as a distraction, her sexuality is often put on overt display. She appeals to the male gaze, and the camera is often seen zooming in on her groin, thighs, chest, or butt regions. Both of these scenes come from episode one of season four in *NCIS: Los Angeles*. They both display a prime example of the male gaze. The main Hispanic female character (Kensi) and a main male character (Marty) are seen walking into a bank. The male character is wearing a dark blue business suit, while Kensi is wearing a pink blouse, a black mini-skirt, with knee-length black boots.

Scene 1:

Kensi: Think we're on their radar?

Marty: In this suit? Are you kidding me? Probably haven't taken their eyes off me since I got out of the car. (Glances at Kensi's back)... Or it could be... Yeah, it's probably you. Just saying, that skirt is working.

Both characters walk into the bank

Scene 2:

Both characters are in the bank, talking to different bank tellers

Camera switches to show Kensi in the foreground, being looked at by Marty and the male bank teller that is serving him.

Female Bank Teller: Even if I was authorized to, which I'm not, it's a two key system and I need your husband's key.

Kensi: You want a key? I'll give you a damn key.

Marty and male bank teller again glance at Kensi. Camera then switches to Marty and male bank teller.

Male Bank Teller: I just need to check your I.D. on file.

Marty: If we could do this quickly, I'm actually in a little bit of a hurry.

Camera switches back to Kensi who has dumped the contents of her bag on the female bank teller's desk.

Kensi: There you go.

Camera switches to male bank teller, who is looking at Kensi. Camera alternates between male bank teller looking at Kensi, and Kensi, who is bending over, looking for a key. As the scene continues, the camera zooms in on Kensi's butt, her thighs, and her skirt, which has hiked up.

This portrayal of Kensi as a sexy distraction undermines Hispanic females as being actual people as opposed to sexual objects. The portrayal of Kensi shows her according to the male gaze. This is evident by the camera constantly shifting between Marty and the male bank teller, both of who are gazing at Kensi.

Kensi also fails the Bechdel test by exclusively discussing her husband. This scenario, as well as many others in *NCIS: Los Angeles*, supports the patriarchy and the belittlement of Hispanic women as solely exotic sexual beings. The superficiality of Kensi being a strong main character is cast aside upon analysis of her role in the show, which is mainly as a sexy distraction and/or bait.

DISCUSSION

Television is a powerful medium in American culture. On average, Americans will spend five years of their lives watching television (U.S. Bureau of [Statistics](#), 2013). As such, most Americans are very much influenced by what they are exposed to on television. What Americans see on the top three most watched shows is not what can be seen in real life. Among female characters, there is a disparity. White female characters are shown in much larger proportions on these television shows, 72.05%, as compared with their actual percentage of 62.8% (U.S. Census Bureau). This discrepancy is seen with black and Hispanic females as well. These groups are also underrepresented in America's most watched television shows. Hispanic women comprised 9.01% of characters in these television shows, while in actuality Hispanic women represent 16.9% of the population. Similar results were observed for African American women. In these television shows, they composed 7.14% of characters, while in real life they make up 13.1% of the population (U.S. Census Bureau).

Main and secondary characters were also documented for Hispanic women. The majority of documented Hispanic women were found to be main characters. However, it should be noted, that of these documentations, all 24 were of the same character. If this character were to be counted as one, then the results would have shown that the vast majority of Hispanic females in these three shows are secondary characters, only appearing once in the show, and with minimal lines and input.

The occupations of Hispanic women on these three shows were also skewed, due to the same character being recorded 24 times. If this character were to represent one, the results would show that half of the Hispanic females on television had occupations in the private, home sphere.

The way Hispanic females are shown in America's most watched television shows gives cause for concern. Upon closer examination, there has been no real shift in how these characters are portrayed. There has been a superficial shift, but beneath it, we see the same stereotypes. The stereotypes of the "crazy Latina" and the "sexy Latina" are offered up for consumption in these shows. This superficial shift has blinded society from the way these characters and shows perpetuate patriarchy and continue the sexualizing of Hispanic females.

CONCLUSION

Due to television being consumed by almost every American, what is seen on TV has a broad effect on not only individuals, but also society. American culture is shaped and changed by what is shown on television. Therefore, if one group of people is constantly presented in a certain way, this stereotype, by being constantly reinforced through American media, soon becomes a belief and part of the way society sees and thus treats this segment of the population. Hispanic women are rarely seen on television, despite their growing population. This causes this group to become marginalized and nearly invisible. Even in the rare instances when this group is portrayed on television, it is often in stereotypical ways. These portrayals reinforce the negative images and beliefs surrounding Latinas.

Latinas are more than just domestic females who have meaning only through their male family members, and they are more than exotic women who are valued more for their sex appeal than their intelligence. Latinas

are people as well, people who have a wide range of varied roles. They are not merely stereotypical, shallow representations. Unfortunately, this is what the media often portrays. Even in America's most popular shows, Latinas were still a very minor character group who usually only served a purpose in respect to their Caucasian counterparts. With the American population changing, Latinas deserve to be shown in more ways than they are currently represented. They are one of the fastest growing population groups, and as such, they deserve to have as many varied and wide-ranging roles as their Caucasian counterparts. American television must be urged to become more representative of American life.

DIRECTIONS FOR FUTURE RESEARCH

The methods of this research could be improved by expanding the potential data and including more television shows. It could also be added to by documenting the portrayals of Middle Eastern women, who made up a surprising amount of the characters documented. The number of Middle Eastern women present in the shows was an unanticipated finding. This group also represents a minority and their portrayal is worth analyzing. This is especially so, due to their large number of appearances and overrepresentation.

Also, a more in-depth study of the main Latina character in *NCIS: Los Angeles* would have proven useful for future research. This would better show the representation of Latinas on television.

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APPENDIX A. Coding Sheet

Show

Episode #:

Race	Cues	Occupation	Position	Bechdel	Examples	Open	Main character/ support
Asian, Hispanic, Black, White, other							
Asian, Hispanic, Black, White, other							
Asian, Hispanic, Black, White, other							
Asian, Hispanic, Black, White, other							
Asian, Hispanic, Black, White, other							
Asian, Hispanic, Black, White, other							
Asian, Hispanic, Black, White, other							

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>.

Please direct information to:

McNair Scholars Program
Texas A&M University- Corpus Christi
6300 Ocean Drive, Unit 5791
Glasscock Building
Corpus Christi, TX 78412
361-825-3835
mcnair.tamucc.edu

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