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A Catholic and Marianist Liberal Arts Institution

The St. Mary's University
McNair Scholars Program

RESEARCH
JOURNAL

Fall 2014 Volume VII

The St. Mary's University
McNair Scholars Program

RESEARCH JOURNAL

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McNair Scholars Program

RESEARCH JOURNAL

Fall 2014 **Volume VII**

The Ronald E. McNair Postbaccalaureate Achievement Program is a federally funded TRIO program that was designed to honor Dr. McNair by supporting and encouraging first generation, low-income students from groups traditionally underrepresented in graduate education to pursue and earn doctoral degrees. St. Mary's University McNair Scholars Program has now received its second award, enabling the program to serve another cohort of deserving undergraduates.

St. Mary's program is unique in that it includes students from Humanities & Social Sciences, the Bill Greehey School of Business and the school of Science, Engineering and Technology. Each scholar worked closely with a mentor from his or her specific discipline to complete an appropriate research project. Many of these mentors are faculty members at St. Mary's, but others are from outside universities and agencies. Each of these mentors deserves special recognition for the dedication shown in preparing these scholars for their future.

For many of the individuals whose work is here presented, this is the first published research in what will be a long and productive career. We are pleased to provide a forum to showcase these works and look forward to following the careers of these students through their doctoral studies and beyond.

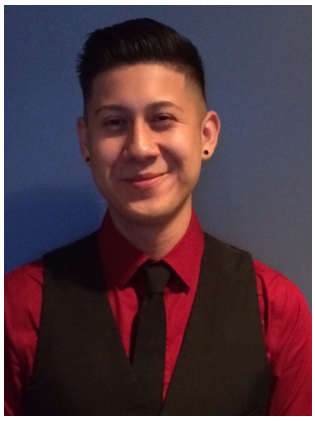
Jennifer Zwahr-Castro, PhD
Director, St. Mary's University McNair Scholars Program

Table of Contents

Avila Roque, Sergio	5
Castaneda, Yesenia	18
Chavez, Crystal	37
Cuellar, Maya	48
Kuhn, Caroline	61
Jimenez, Raul O.	76
Mialkowski, Rachel	85
Nunez, Jennifer	98
Rodriguez, Nicole	115
Sepulveda, Gabriela	138
Trevino, Christopher	151

Body Modification Dress Code Policies in the Workplace

Sergio A. Avila Roque



Mentor: Prof. Erin O'Brien
Department of Psychology,
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Abstract: *This study aims to determine what kind of dress code policies exist for different industries (e.g., retail trade, information, and leisure and hospitality) in regards to individuals with body modifications, particularly tattoos and piercings. According to Forbes, up to 35% of the population has some form of a body modification (2001). Because of the number of people with body modifications in the general population and the lack of literature on the subject, this study attempted to establish relationships between the type of organization and dress code policies as they relate to body modification. This study focused on the service industry, as the employees would have the most interaction with people (customers) and felt policies regarding appearance would be more prevalent. I believed these types of organizations would be more likely to have a policy in place for body modifications (94% had a policy about tattoos or piercings). Chi-square test of independence revealed that none of relationships between job type and tattoo policy were significant. Potential reasons for these findings are discussed. This study did not address piercings as most organizations had limited policies in place. Limitations and future research are discussed.*

Body Modification Dress Code Policies in the Workplace

The way I perceive people has a lot to do with their physical appearance (Burgess & Clark, 2010). Physically appearances have been shown to affect our judgment of individuals on multiple levels, especially if that individual has a visible tattoo (Burgess & Clark, 2010; Wohlrab, Stahl, Rammsayer, & Kappeler, 2007). Body modifications (BM), as defined by Tate and Shelton, are procedures designed to change the appearance of the body and include adornments, branding, coiffure, cosmetics, cutting, body piercing, scarification, and tattooing (2008). Regardless, of whether or not BMed individuals engage in risky activities they were still perceived to have done so by others (Forbes, 2001; Resenhoeft, Villa, & Wiseman, 2008). The primary focus of this study will be on a subset of BMs, tattooing – marks made by inserting colored pigment into the skin (Swami & Furnham, 2007) – and how this form of BM is addressed in the dress code policies of various service oriented organizations.

The culture of tattoos has been spread throughout the world over time. The origins of tattoos are not certain. They appeared virtually everywhere over the centuries. Research has shown that historically tattoos were indicators of belonging to an exclusive group like the military, gangs, or criminals (Degelman & Price, 2002; Forbes, 2001; Swami & Furnham, 2007; Wohlrab, Stahl, & Kappeler, 2007).

Recent studies suggest body modified individuals are no longer exclusive to fringe groups (Wohlrab, Stahl, Rammsayer, & Kappeler, 2007). BMs are becoming more prevalent in mainstream popular culture (Burgess & Clark, 2010). BMs are beginning to become marks of religious affiliation, strength and even social status; more dominantly though, BMs are becoming fashion statements (Burgess & Clark, 2010; Tate & Shelton, 2008; Wohlrab, Stahl, Rammsayer, & Kappeler, 2007). This could be due to the fact that celebrities brandish tattoos (Swami & Furnham 2007). Another reason why they have entered the mainstream is because of the advances in technology. Technology has changed the industry from using potentially unclean, rudimentary materials to using advanced, electronic equipment. People are more likely to get tattoos now because they are safer and faster to obtain and are less painful. These technological advances have also lowered the costs and risks associated with BMs (Swami & Furnham 2007).

BMs have many impacts not only on perception but also on the health of the individual undergoing the change. Tattoos can cause an allergic reaction, infection, scarring, and increases the exposure to blood-borne illnesses scarring (Resenhoeft, Villa, & Wiseman, 2008). Mentally, some individuals may not be able to handle the adverse impacts that come with the stigma of having BMs and this can lead individuals into states of depression and anxiety, because they are constantly being judged by others (Resenhoeft, Villa, & Wiseman, 2008). And although advances in technology have lowered the costs of undergoing BMs, it can still be very costly, especially for those who have several tattoos. Tattoos can range in cost from the low hundreds to thousands of dollars. It becomes even more expensive if one wishes to remove their tattoos (Wohlrab, Stahl, Rammsayer, & Kappeler, 2007).

Even with all the potential negatives associated with tattoos, Wohlrab, et al. found that they are gaining in popularity (2007). BMs are slowly being disassociated with substance abuse like marijuana and alcohol (Forbes, 2001; Swami & Furnham, 2007; Tate & Shelton, 2008). In eastern cultures, BMs were viewed as a way of honoring the past and self (Burgess & Clark, 2010; Degelman & Price, 2002; Forbes, 2001; Resenhoeft, Villa, & Wiseman, 2008), whereas in western culture BMs are now predominately obtained because individuals "like the looks of them," (Forbes, 2001).

The stereotype of tattoos is changing, given that about 14-35% of the population now has at least one (Forbes, 2001). The increase in the population with tattoos and piercings is further evidence that the negative association of BMs is diminishing (Forbes, 2001; Swami & Furnham 2007; Wohlrab, Stahl, & Kappeler, 2007). It has been noted that older generations perceive tattoos as markings of deviant behavior (Resenhoeft, Villa, & Wiseman, 2008), while younger populations perceive BMs positively, as objects of self-identification (Resenhoeft, Villa, & Wiseman, 2008; Swami & Furnham, 2007). This suggests that in future generations, if the trend continues, the negative connotations associated with BMs will begin to diminish further, eventually reaching a point where there are perhaps no negative connotations with having BMs.

Across all cultures, it has been found that BMs are predominately associated with the male gender (Forbes, 2001; Wohlrab, Stahl, Rammsayer, & Kappeler, 2007). No longer exclusive to males, females are becoming more likely to have BMs, especially in North America, Europe, and Japan (Burgess & Clark, 2010; Swami &

Furnham, 2007). Although cultural connotations are less negative, there are still some major differences when it comes to perceptions of tattoos across genders. Females with BMs are perceived as promiscuous (Swami & Furnham, 2007; Tate & Shelton, 2008; Wohlrab, Stahl, Rammsayer, & Kappeler, 2007), less attractive, less intelligent, and less healthy (Burgess, & Clark, 2010; Resenhoeft, Villa & Wiseman, 2008; Swami, & Furnham, 2007). It was also found that males tend to judge females with BMs more harshly than those who did not have BMs. However, females with 'cute' tattoos (e.g., suns, dolphins, and small, brightly-colored tattoos) were not perceived significantly different than non-tattooed females (Burgess & Clark, 2010; Resenhoeft, Villa, & Wiseman, 2008).

Because the culture of BMs has been associated with males since its inception, BMs have been viewed as a norm for male-dominated society. BMs have even acted as a positive handicap when it comes to mate selection, with females rating tattooed males as more attractive (Wohlrab, Fink, Kappeler, & Brewer, 2009). However, too many tattoos can spell trouble for males. A recent study by Burgess and Clark found that there exists a negative connotation with tribal tattoos (black Celtic and bold, black artistic designs) because the individual is perceived as aggressive (2010).

Given the increasing prominence of tattooed individuals, it is important that we gain a better understanding of companies' policies about body modifications and their potential effects on applicants. Farley, Chia, and Allred tested whether people who are rated as being more attractive tend to have an easier time at getting hired (1998). Surprisingly, their findings showed that those rated as less attractive were more desirable when it came to getting hired. This was attributed to something they dubbed the "everyone is biased except for me" phenomenon, an unconscious desire for self-preservation. There would exist less competition by hiring the 'unattractive' people. I suggest that because it was shown that people with body modifications are rated as less attractive and less attractive people are more desirable new hires more tattooed individuals are being hired.

What then becomes of these new hires when they sign on to their new jobs? When a job offer is extended to a potential employee, labor and employment laws allow the employer to regulate the way the employee dresses. By accepting the offer and getting hired into the organization, the employee then has to abide by all rules and regulations, including dress code policies. Recently, dress code policies have come under scrutiny because of their vague description as to what constitutes 'casual' clothing and because 'casual' clothing can leave more areas of the body exposed (Hazen & Syrdahl, 2010). This could potentially lead to having visible tattoos at work.

Currently there exist no laws that protect against discrimination of people with body art. Therefore, companies are within their legal right to regulate what employees wear, as long as such policies do not infringe of the individuals religious, ethnic, etc. beliefs or qualities. It is within the company's right to ask employees to cover up body modifications, like tattoos and piercings, because this can affect revenue for certain industries. A study done on the way doctors dressed showed that people expect certain things from healthcare professionals. When the doctor wasn't dressed appropriately (in a clean white coat), their level of competence was considered impaired and therefore caused patients to be

more wary of them (Menahem & Shvartzman, 1998).

A study conducted by Warhurst and Nickson found that employee appearance played a crucial role in the way the company was perceived because companies are willing to spend money on uniforms so that a positive brand image is projected to customers (2007). A simple way to think of this would be to consider two scenarios, one in which you walk into the same exact restaurant, except the employees are dressed differently while everything else is held equal. On the one hand you are served by a very elegantly dressed waiter who wears a button up long sleeved shirt and a tie, then at a different time you are served by someone who is dressed more casually, someone who has visible tattoos. Regardless of everything else, and based purely on the employee, a majority of the time the second, tattooed individual might garnish more scrutiny and might even deter you from returning to that restaurant.

Having a body modification, like a tattoo, comes with many risks, but one of the more significant ones is being discriminated against by potential employers. A study done by Dale, Bevill, Roach, and Glasgow surveyed 1,412 students at nine universities found that 41.17% of the students would not hire people with tattoos even though only 20% of them reported having some sort of policy in act against having visible tattoos at their own jobs (2007).

There is little research on the study of BMs and the workplace even though there is a common belief that people cannot be hired if they have visible tattoos. Technology has made it possible for employees to work from anywhere (e.g., home office, coffee shop, and waiting rooms) and they are not limited to being in the office. Tattooed employees are now more than ever exposed to the public. Because there are such different perceptions of BMs in the workplace, the aim of this study is to evaluate the workplace policies regarding BMs. I will then compare policies across various organizations and sectors (i.e., profit vs. non-profit, public vs. private, small vs. large, government vs. non-government, and classifications according to the Bureau of Labor and Statistics). The aim of this study is to establish a baseline approach to whether there exists a significant relationship between various organizations and specific tattoo policies. I aim to get at why an individual has a 30-70% chance of not getting hired (Burgess & Clark, 2010; Degelman & Price 2002; Tate & Shelton, 2008) by investigating dress code policies. I will address the concerns with several research questions:

Research Question 1: Is there a relationship between tattoo policy and organization size?
Research Question 2: Is there a relationship between tattoo policy and government classification?
Research Question 3: Is there a relationship between tattoo policy and organization sector?
Research Question 4: Is there a relationship between tattoo policy and profit classification?
Research Question 5: Is there a relationship between tattoo policy and organization classification?

Method

Organizations

The sample size for the current study was 116 organizations. I defined organizations as any specified group of people who share a common goal.

One method used to classify the organizations was based on size. Considerations for small versus large organizations were if it was only a local

business or if it had branches across the nation as well. If the organization was only local and consisted of a few branches then it was considered to be a small organization. If the organization had branches both locally and in other states then it was classified as a large organization. Of the 116 organizations, 12 (10.34%) organizations were considered small organizations and 104 (89.66%) were considered large organizations.

Once an organization was classified as either small or large they were then classified as either government or non-government. This was done through self-report or a quick web based search of the organization. Of the 116 organizations 14 (12.07%) were classified as being government organizations and 102 (87.93%) were considered non-government.

Organizations were also determined to either be in the public or private sector with 74 (63.79%) organizations being public and 42 (36.21%) organizations being in the private sector. Another category the present study took into account was whether the organization was nonprofit or for-profit. Of the 116 organizations, 19 (16.38%) were nonprofit and 97 (83.62%) were for-profit.

Finally the organizations were classified, according to the Bureau of Labor Statistics subsectors for the service industry. There are 13 service-providing, sub-industry sectors, including: utilities, wholesale trade, retail trade, transportation and warehousing, information, financial activities, professional and business services, educational services, health care and social assistance, leisure and hospitality, other services, federal government, and state and local government.

Procedures

Organizations were contacted either in person, over the phone, or through email, or an Internet search of the organization and their policy was conducted. Information about the organization was gathered by speaking to someone in the Human Resources department of each organization. A copy of the interview script and the email used can be found in appendices A and B, respectively. Each organization was asked to self report their size, government affiliation, sector, profit, and classification. If none was provided, I used the above procedures to determine the categories for each organization.

I classified tattoo policies into two main groups: the existence of a specific policy about tattoos (N = 109, 93.97%) and the nonexistence of a specific policy regarding tattoos (N = 7, 6.03%). The existence of a policy about tattoos was broken down into four distinct categories: all tattoos are allowed with no restrictions (N = 0, 0%), tattoos are allowed to be shown as long as they are not offensive (N = 34, 29.30%), tattoos are allowed but must be covered (N = 61, 52.6%), and tattoos are not allowed (N = 14, 12.1%).

Results

I only collected 7 of 13 types of organizations classified by Bureau of Labor Statistics subsectors for the service industry. The classification breakdowns were: 16.4% organizations in educational services, 3.4% as federal government, 5.2% in financial activities, 29.3% were classified as leisure and hospitality, 2.6% as professional and business services, 36.2% as retail, and 6.9% as transportation and warehousing (N = 116). The organizations were also classified on several categories: size, profit versus nonprofit, government versus non-government, and public versus private sector. Table 1 shows the frequency breakdown for all possible classifications for the organizations.

I conducted chi-squared test for independence to test the relationship between the various classifications of the organization and tattoo policy. Seven

organizations did not have a specific policy about tattoos in the workplace and their data were not included in these analyses. The chi-square analysis indicates that there is not a significant relationship between size of an organization and tattoo policies ($\chi^2 = 4.78$, $p > .05$, $N = 109$). Table 2 shows the chi-square results between size of organization and tattoo policies. I did not find support for research question 1.

The chi-square analysis indicates that there is not a significant relationship in government and non-government organization and tattoo policies ($\chi^2 = 2.00$, $p > .05$, $N = 109$). Table 3 shows the chi-square results between government classification and tattoo policies. I did not find support for research question 2.

The chi-square analysis indicates that there is not a significant relationship between public and private organization and tattoo policies ($\chi^2 = 5.53$, $p > .05$, $N = 109$). Table 4 shows the chi-square results between organization sector and tattoo policies. I did not find support for research question 3.

The chi-square analysis indicates that there is not a significant relationship between profit and non-profit organizations and tattoo policies ($\chi^2 = 2.90$, $p > .05$, $N = 109$). Table 5 shows the chi-square results between profit classification and tattoo policies. I did not find support for research question 4.

The chi-square analysis indicates that there is not a significant relationship between organization classification according to the Bureau of Labor and Statistics and tattoo policies ($\chi^2 = 19.16$, $p > .05$, $N = 109$). Table 6 shows the chi-square results between organization classification and tattoo policies. I did not find support for research question 5.

Discussion

Our results focused only on tattoos because the policies on piercings were consistent across all organizations (except two). A gender gap became very apparent in their dress code policies. All of them were specifically addressed at females, with no mention of piercings for males. There were two organizations that allowed for any facial piercings for both genders. None of the organizations had policies in place against the other forms of BM: adornments, branding, coiffure, cosmetics, cutting, and scarification, so I did not address those forms of BM.

The results indicate that there is not a relationship between any of the categories (size, government classifications, organization sector, profit classification, and organization classification) and tattoo policy for an organization. For both the size and government classification, it is likely that the small sample size (small organizations only had 12, and government organizations only had 14) affected the results.

Limitations

One of the major limitations faced had to deal with the sample size. Our sample size was too small in some categories to be able to detect a difference, particularly in the organization classification category. I only compared 7 out of a possible 13 organization types. Collecting data from a greater number of organizations and more varied organizations would help increase the possibility of finding a significant relationship. For example, certain categories had more participants than others (i.e., retail and professional services, respectively).

Another limitation of this study was the classifications used to categorize the organizations. I could have used more specific categorizations. For example, instead of classifying an organization as large versus small, I could have included medium-sized organizations and included

things such as number of employees into the classification.

Future Research

There still exists very little research in this area of study and future research will aim at fixing the limitations presented in this study. One possible avenue for future research would be to build on this research with the aim of addressing the reasons why some companies have no problem with visible tattoos (as long as they are non-offensive) while others still pressure an employee into covering visible tattoos or not hiring them at all.

Another possible avenue for future research is to address the organizations that do allow tattoos, but with restrictions. Particularly focusing on organizations that allowed tattoos as long as they are covered up. I believe that covering a tattoo can oftentimes draw more attention to the tattoo than just letting it be visible. Future research could address this with an experimental design.

Another possible idea for future research is to determine if customers are actually turned off by employees with tattoos. An empirical study could examine effects of customer satisfaction of employees with visible tattoos compared to employees with no visible tattoos.

My study aimed to see if there was a significant relationship between type of organization and specific tattoo policies. While I did not find a relationship with any of the types of organizations, there is still a potential for future research to examine this topic in more depth. In the end, I would like to determine if the common belief that someone with tattoos cannot get a job is true.

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Table 1

Frequency of Type of Organization

Type of Organization	Frequency	%
Organization Size		
Small	12	10.3
Large	104	89.7
Total	116	100
Government Classification		
Government	14	12.1
Non-Government	102	87.9
Total	116	100
Organization Sector		
Private	42	36.2
Public	74	63.8
Total	116	100
Profit Classification		
Profit	97	83.6
Non-Profit	19	16.4
Total	116	100
Classification of Organization		
Educational Services	19	16.4
Federal Government	4	3.4
Financial Activities	6	5.2
Leisure & Hospitality	34	29.3
Professional & Business Services	3	2.6
Retail	42	36.2
Transportation & Warehousing	8	6.9
Total	116	100

Table 2
Crosstabulation of Size of Organizations

Organization Size	Tattoo Policy			χ^2	p
	Non-Offensive	Covered	Not Allowed		
Small	2	3	3	4.78	.09
Large	32	58	11		

Note: * = $p \leq .05$, $N = 109$

Table 3
Crosstabulation of Government and Non-Government Organizations

Government Classification	Tattoo Policy			χ^2	p
	Non-Offensive	Covered	Not Allowed		
Government	2	9	1	2.00	.37
Non-Government	32	52	13		

Note: * = $p \leq .05$, $N = 109$

Table 4
Crosstabulation of Public and Private Organizations

Organization Sector	Tattoo Policy			χ^2	p
	Non-Offensive	Covered	Not Allowed		
Private	17	39	12	5.53	.06
Public	17	22	2		

Note: * = $p \leq .05$, $N = 109$

Table 5
Crosstabulation of Profit and Non-Profit Organizations

Profit Classification	Tattoo Policy			χ^2	p
	Non-Offensive	Covered	Not Allowed		
Profit	32	50	13	2.90	.24
Non-Profit	2	11	3		

Note: * = $p \leq .05$, $N = 109$

Table 6
Crosstabulation of Types Organizations

Type of Organization	Tattoo Policy				
	Non-Offensive	Covered	Not Allowed	χ^2	*p*
Educational Services	2	9	4	19.16	.09
Federal Government	0	4	0		
Financial Activities	0	5	1		
Leisure & Hospitality	13	17	4		
Professional & Business Services	2	1	0		
Retail	17	19	5		
Transportation & Warehousing	0	6	0		

Note: * = $p \leq .05$, $N = 109$

Appendix A

Phone Interview Script

Hello, my name is Sergio Avila Roque I am a third year undergraduate attending St. Mary's University in San Antonio, Texas.

The reason I am calling is because I am working on a summer research project, with Professor Erin O'Brien at St. Mary's in regards to dress code policies across various types of organizations and I was wondering if you would be able to answer a few questions for me? Who do I have the pleasure of speaking with today, in case I need to contact you again?

First would you be willing to provide me with a copy of your dress code policy, if so can I have an email address so I can send you a reminder for that?

If not, would you still help me by answering the questions I need in order to complete my sample for my research?

-does your organization address body modifications in your dress code policy?
-if yes, what kind of body modifications does it address? for example, does it address tattoos or piercings?
-Would your organization be classified as small or large?
-is the organization considered government or non-government?
-is the organization in the private or public sector?
-is the organization for profit or not-for-profit
-would the organization be willing to be named specifically in this research study?

Thank you so much for providing me with the information I need to complete my research study. If you would like to contact me or my advisor, I would be happy to provide you with our contact information. (Erin – 210-436-2002 or eobrien4@stmarytx.edu). Thank you for speaking with me, I truly appreciate your time. Have a great day.

Appendix B

Email Script

To whom this may concern,

My name is Sergio Avila Roque, I am a third year undergraduate at St. Mary's University in San Antonio, Texas. I was accepted into the McNair Scholars program for the summer. The main goal is to help underrepresented first generation students attend graduate school through undergraduate mentorships and pre-graduate school prep by completing a research project.

I am contacting you because I was hoping you could help me with my research for this summer. My research interests have to do with dress code policies among various organizations. It would be a great help to me, and my research, if you would be willing to provide me a copy of your dress code policy. Your organization will not be specifically mentioned in any published material. It would also help me if you could tell me if your organization is classified as part of the public sector or private.

Thank you so much for taking the time to consider providing me with the data I will need to further my academic goals. Should you have any questions or concerns you can contact me directly or my faculty mentor, Erin O'Brien, who is copied on this email.

Best,

Sergio A Avila Roque

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Evidence to Support an Attachment Interpretation of Beluga Mother-Calf Relationships

Yesenia Castaneda

Mentor: Dr. Heather Hill
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Abstract: *The bond between many cetacean mothers and calves is long-lasting and enduring. It is currently unclear if the bond is biologically driven, such as through imprinting or if it is also psychologically driven, such as through an attachment. Using 12 hours of archived video recordings for 2 mother-calf beluga pairs, the first year of life was coded for calf exploratory behavior, mother-calf swims, social interactions, and attachment behaviors. Unique to this study was that one calf was temporarily paired with a surrogate female for the first 3 weeks of life before successfully bonding with the biological mother. Results showed different behavioral patterns for the calves. When housed with the surrogate female, the calf displayed exploratory behaviors 68% of his time and swam with the surrogate 29%. With his biological mother, the calf divided his time more evenly between exploratory behavior (46%) and pair swims (56%). The second mother-calf pair displayed typical mother-calf patterns from birth with 53% of her time swimming with her mother and 42% of her time engaged in exploratory behaviors. In attachment behaviors the first calf displayed 2 secure base events with the surrogate but 14 secure base events and 4 safe haven events with his biological mother. The second mother-calf pair spent more time together overall, which resulted in 5 secure base events and 3 safe havens. These results suggest that the surrogate mother may have allowed the calf to practice the following behavior needed to develop a bond with an adult, and upon reunion with his biological mother, the calf was able to engage in behaviors that were more typical of an attachment bond, as represented by the other mother-calf pair. Whether imprinting or attachment is the best representation of the beluga mother-calf bond is discussed further.*

Evidence to support an attachment interpretation of beluga mother-calf relationships

Offspring with a period of dependence are unlikely to survive if parental care is removed. In species in which imprinting occurs, mothers that are separated from offspring during the critical period reject their offspring if imprinting does not occur (Bowlby, 1988). Thus, offspring will most likely fail to survive due to the lack of protection and nourishment (Ainsworth, 1989). Although not an imprinted bond, human mothers separated from their infants for long periods of time also fail to show quality care in the form of tenderness or commitment to their infants, leading to difficulties in all aspects of the infant's development (Ainsworth, 1989).

Forms of Parental Care

All types of animals provide parental care to varying degrees. While some animal's engage in more complex forms of parental care such as teaching or interventions from unsafe activities, others limit care to more basic behaviors, such as egg guarding, nest guarding, or food procurement. For example some insects, such as burying beetles (*Nicrophorus*), provide elaborate forms of care for offspring ranging from securing nourishment to redirecting offspring away from dangerous situations and predators (Eggert, Reinking, & Müller, 1998). This parental care led to significantly higher levels of larval survival. In contrast, other animals such as green sea turtles (*Chelonia mydas*) lay their eggs in an underground nest but leave the eggs to hatch without protection. In general though, the longer the offspring dependency period, the more parental involvement is required (Ainsworth, 1989). These long periods of dependence and offspring care provide opportunities for bonds to develop beyond the simple purpose of protecting the physical well-being of offspring.

Imprinting Process

Originally the bond between animal offspring with periods of dependence and mothers was thought to be driven by a biological force (i.e., to provide nourishment and to protect the offspring from environmental threats). Later, the process of imprinting was proposed to explain the bond between mothers and offspring (Immelman, 1975). Imprinting was defined as a rapid learning process by which a newborn or very young animal establishes a behavior pattern of recognition and attraction to another animal or to a substitute object identified as the parent (Greenberg & Haraway, 1998). Konrad Lorenz recognized five characteristics that distinguished the imprinting process from other associative learning: 1. Imprinting occurs only during a critical period, 2. Most imprinted bonds are irreversible, 3. The bond affects behaviors as the individual matures, 4. The bond facilitates the learning of species typical behaviors, and 5. The imprinted bond is not due to reinforcement. Imprinting occurs in a variety of animals, including birds and mammals (Greenber & Haraway, 1998). For example, a European cuckoo (*Cuculus canorus*) female will select a specific bird to rear during the critical period of imprinting and will care for that bird (Immelmann, 1975). Thus, the newly hatched birds will bond with the surrogate mother and approach the imprinted figure and maintain close proximity to that surrogate bird and not to the biological mother (Rajecki, 1973). When the imprinting process takes place with European cuckoos, findings show that maternal care is rarely selective. Mothers will care for any young in the nest at the moment. Unlike birds, most domestic ungulate mothers develop limited care for neonates that have been familiar to the ungulate since parturition. Ungulate neonates must be marked by the mothers to be recognized by odor and imprinted upon. Any young animal that is unfamiliar to an ungulate mother will be rejected often with aggressive behaviors (Poindron, Lévy & Keller, 2007).

While the idea of imprinting contributed to the understanding of the development of mother-offspring bond, Harry Harlow questioned the theory (as reviewed by Craig, 2000). Harlow tested the hypothesis that the mother-offspring bond was due to the nutrition provided by the mother. In a variety of experimental studies with rhesus monkeys, (*Macaca mulatta*), Harlow found that when a cloth-covered surrogate monkey and wire-mesh monkey were offered to provide nourishment, the infants preferred the cloth-covered monkey

over the wire-mesh monkey despite the wire mesh monkey being the source of nourishment. Harlow's initial observations were confirmed as well when the infant came across threatening stimuli and, preferred to seek comfort from the cloth-covered surrogate monkey (Craig, 2000).

Initially, Harlow was unable to explain the preferences that the rhesus monkey infants displayed. Subsequent social isolation studies provided some insight into the lifetime developmental outcomes of infant monkeys reared in the absence of a mother. The results indicated that monkeys that were isolated for short periods of time quickly recovered and lived normal adult lives, whereas monkeys that were isolated for prolonged times suffered the most difficulties and could not act functionally in the social activities of the monkey colony. Moreover, the females that had been isolated for long periods of time from other monkeys exhibited abnormal social behaviors and were abusive toward offspring. The studies suggested that social interactions and parental care of offspring were critical components for normal monkey development. While these studies implicated, the importance of a mother-infant relationship they did not clarify the mechanism driving the development of these relationships, particularly for other mammals, like humans (Seay, Alexander & Harlow, 1964).

Attachment Theory

The development of the attachment theory by John Bowlby and Mary Ainsworth provide another explanation and possible mechanism for the development of the mother-offspring bond (Craig, 2000). Influenced by the imprinting theory and Harlow's research, attachment theory was based on the belief that the mother-child bond was the essential and primary force in infant development. An attachment was an affection-based tie that one person or animal forms with another individual that endures across time and contexts (Craig, 2000). Bowlby initially suggested that the primary reason attachments developed was to secure the survival of helpless infants by providing protection from dangerous situations (Miller, 2002). For example, human babies display signaling behaviors (e.g., crying, smiling) that communicate their needs to the caretaker. Initially, babies perform these signaling behaviors in the presence of any human adult. However, over time the infants become more discriminating towards whom they direct the displays. The time at which infants begin to show preferences depends on the development of a clear attachment, usually around 8-12 months (Craig, 2000).

Mary Ainsworth extended Bowlby's ideas on attachment, discovering that infants changed their behaviors depending on the presence or absence of certain people and threats. Ainsworth documented the developmental sequence of attachment formation (Craig, 2000). She suggested that attachment behaviors developed in four phases: 1. Undiscriminating social responsiveness, 2. Discriminating social responsiveness, 3. Genuine attachment to the primary caretaker, and 4. A goal-corrected partnership in which the first attachment relationship provides the foundation for future interactions with others as future interactions will contain some of the same qualities as the first (Craig, 2000).

While attachments are biologically driven (e.g., human infants are prepared to form bonds with any available human), the bonds are more complex than the bonds developed through imprinting or the basic parent care provided by other species. As demonstrated by Harlow's work with rhesus monkeys, infants who were scared, threatened, or fatigued sought a

psychological comfort from the attachment figure. The work by Ainsworth was supported by studies with human infants who had formed a clear attachment and refused to be comforted by anyone who was not the attachment figure (Ainsworth, 1964). Thus, the signaling behaviors of both infants and adults are synchronized into an attachment behavioral system. When infants cry, adults will pick the infants up and display comforting behaviors until they are soothed. In contrast, when infants laugh, adults look at the infants and smile or interact with the infant.

Behavioral Systems: Caregiver and Infant

Attachment theory proposed that three behavioral systems were critical to the foundation of an attachment: the caregiving system of a parent, the attachment system of the infant, and the exploratory system of the infant. The goal of the caregiving system is to protect the infants and keep them close during times of threat or danger. The responses of the caregiver are often correlated with strong emotional feelings, including the desire to remain close to the offspring and feeling anxiety or anger when that proximity is threatened (Solomon & George, 1996). The attachment system of the infant is centered on the idea of keeping close proximity to a caregiver and feeling secure. The attachment system of the infant changes with age and the surrounding environment, such that as the infant ages proximity incorporates both physical and psychological distance (secure base & safe haven). By the first year of life, human children are mobile and able to fully explore the environment. Thus, when in a novel environment or around a novel person, children search or protest until the child finds the attachment figure and the attachment system is engaged. If the attachment system is engaged, exploration will be reduced until the attachment figure returns. After the attachment figure returns, most one-year olds first seek proximity or contact and then continue with the previous activity (Sroufe & Waters, 1977).

One example of these behavioral systems may be seen in a study in which mother-infant interactions were investigated for the first year of life (Isabella, Belsky, & von Eye, 1989). The mothers and infants were observed during a period of infant exploration of a novel environment, and measured for the amount of exploration, the number of infant orients towards their mother, and degree of maternal soothing the infant. One-month old infants did not have a preference for the source of who paid attention when in distress. However, by six to nine months, infants preferred their mother's face. In addition, the infants exhibited anxiety around a face that was not their mother's. Once the mother soothed the child, some children returned to their previous activity while other children did not (Isabella et al., 1989). This stage in an infant's life was categorized as the "eight-month anxiety." Around this age the infant perceives that the stranger was not their mother and concluded that their mother had left and became anxious. This facial discrimination occurred due to the infant having a collection of stored memories of how the mothers face looks and certain distinctions that the infant does not recognize in a stranger (Ainsworth, 1969).

Safe Haven and Secure Base

When an infant is in a new environment and encounters an anxiety provoking situation, an aggressive interaction, a threat, fatigue or illness, safe haven behavior is triggered causing a retreat to the mother. The infant will stay with their caregiver until the infant feels safe to return to their previous activities. An infant where an attachment is present but is at a low intensity may cause for the infant to explore

freely knowing their caregiver is responsive and accessible. While they are exploring, secure base behavior may be triggered causing the infant to look toward the mother, minimize distance to the mother, or make some type of contact with the mother. These behaviors reassure the infant that the caregiver is still near.

Attachment Theory and Humans

Ainsworth empirically validated the presence of attachment in humans and identified three types of attachment styles using the laboratory-based experimental manipulation of the strange situation. Using eight different scenarios that each lasted about three minutes, Ainsworth tested the responses of 12-month-old children (Ainsworth, 1964). The situations involve the infant being in an unfamiliar room filled with toys, a stranger, and two separations and two reunions with the mother. In one separation, the infant is left alone with the stranger, whereas in the other separation the infant is left completely alone. The strange situation begins with the mother in the room with the infant and a stranger. While exploring the room and the person, the infant will periodically turn and look at their mother, exhibiting secure base behavior. The responses of the infant during the first separation from the mother give the first clues to attachment. Some infants move forward toward the door crying after their mothers, while other infants do not seem to notice their mother's absence. Upon the mothers return, the infants respond in varying manners. If securely attached, the infants will be calmed by the mother's return and resume exploration. If insecurely attached, a different set of responses will emerge. Many studies have replicated Ainsworth's original results supporting the idea that the bond between a mother and an infant is not just biological, but also psychological since the infant only felt safe and secure with the mother (Londerville & Main, 1981).

Cetacean Development

Many researchers have applied the framework of attachment theory to the caregiving and offspring development of nonhuman animals, including primates, kangaroos, and elephants. With a period of extended offspring care, complex cognition, and a social society, cetaceans are another species that may develop attachments between offspring and mothers. Belugas (*Delphinapterus leucas*) or white whales, are small to medium whales living in the Artic and sub-Arctic waters. Belugas are highly affiliative and often form large herds during social gatherings (Krasnova, Bel'kovich, & Chernetsky, 2006). Females bear calves in shallow estuaries during the summer months when the waters are warmer and food sources are plentiful. Beluga calves are reared solely by the mother for two to five years, depending on the appearance of the next calf or the weaning process. The mother-calf bond is considered one of the strongest and most enduring relationships in cetaceans, as indicated by the amount of time calves spend with the mother and the maintenance of mother-calf proximity (Mann & Smuts, 1998, 1999; Whitehead & Mann, 2000).

The development of the bond between beluga calves and mothers has not been studied extensively. Two studies of a beluga population in the wild (Krasnova et al., 2006, 2009) and two studies of four beluga calves in human care currently exist (Hill, 2009; Hill, Campbell, Dalton, & Osborn, 2013). The behavioral development and maternal care of belugas in human care during the first year of life (Hill, 2009; Hill et al., 2013) have been corroborated by findings with wild belugas (Krasnova et al., 2006, 2009). First, mother-calf swims decreased over the first year of life, but

increased at the end of the second year of life. Early calf life was spent in an echelon or side by side position. However, once calves reached three to four months of age, the calves displayed a preference for an infant swim position. The calves also initiated the majority of the reunions with the mothers during the first year of life, suggesting that calves were responsible for the mother-calf proximity maintenance. As the calves matured, calves displayed more solitary behavior and engaged in more social interactions with each other (Hill, 2009; Hill et al., 2013).

Also of interest were differences in maternal behaviors exhibited by beluga mothers. While all mothers swim with their calves and initiate some reunions when the calves were in danger, two of the mothers engaged in more maternal behaviors than the other mothers (Hill, 2009; Hill et al., 2013). The observations of four beluga mothers in human care suggest that individual differences exist in maternal responses. However, these results must be interpreted with caution as they represent only four belugas in a controlled environment. These results are supported by research with bottlenose dolphins (*Tursiops truncatus*) (Hill, Greer, Solangi, & Kuczaj, 2007). When maternal behaviors were examined across the first year of life for seven dolphin mothers, results indicated that the dolphin mothers cared for calves in many similar ways with the exception of certain behaviors including herding, discipline, and the degree of proximity maintained to the calves. This variation in the amount of control and maternal care behaviors exhibited by dolphin mothers in human care supported previous research indicating that Indian Ocean bottlenose dolphin mothers (*Tursiops aduncus*) in the wild also demonstrated different maternal care profiles (Mann & Smuts, 1998). Additional research with Indian Ocean bottlenose dolphins has found that variations in maternal care influence future social relationships (Gibson & Mann, 2008). In summary, variation in maternal responses to calf behavior and contexts are expected (e.g., some mothers may be more vigilant of calves' actions than other mothers) and may be similar to the variation observed across human mothers and their infants. It is possible that the bond between beluga mothers and calves may represent an attachment based bond much like humans.

The results of a previous study evaluating the feasibility of attachment theory to explain the mother-calf bond in belugas suggested that beluga calves displayed attachment behaviors to preferred individuals (Castaneda, 2013; Castaneda, Hill, & Dietrich, 2014). The current study examined two case studies to further evaluate the use of attachment theory to describe the mother-calf bond in belugas. Archived video recordings were selected and coded for the percent of time spent in the following developmental behaviors: exploratory behavior, mother-calf swims, and social interactions. The frequency with which mother-calf reunions in the form of safe haven and secure base occurred was also documented. The first year of life was divided into three time periods: one month, three months and aggregate of the last half of the first year of life. These time periods corresponded to significant rearing experiences by each calf. The following questions guided the study:

1. What percent of time is spent in selected activities for each calf at one month, three months, and five to eleven months?
2. Did the percent of time in the selected activities change over time?
3. Did the calves demonstrate use of safe haven and secure base,

which represent attachment behaviors, during the first year of life?

4. Did individual differences emerge as related to different rearing experiences?

Method

Subjects

Two beluga mother-calf pairs housed at SeaWorld San Antonio, Texas provided data for the current study. One male calf, SAM, born July 9, 2013 was his mother's, LUN, second calf. Another female calf, STEL born July 26, 2013 was her mother's third successful calf. CRI has been in human care over 20 years since birth in a natural habitat while LUN was born and raised in human care. Six additional belugas (1 adult male, 1 juvenile male, 2 adult females, 2 juvenile females) resided at SeaWorld San Antonio, Texas. The mother-calf pairs were initially housed with each other. However, as the calves matured the mother-calf pairs were integrated with the other belugas. One of the adult females (MAR) acted as a surrogate to SAM for his first month of life when SAM and LUN did not bond initially.

LUN did not bond with her first calf, which may have negatively affected her ability to provide the basic necessities for her new calf. The animal care management decided to place LUN in the same pool as CRI and STEL soon after STEL's birth to give her an opportunity to observe a mother-calf pair that exhibited typical mother-calf interactions. After a few days SAM was than reunited with LUN and she reciprocated with her calf's attempt to swim with her.

Procedure

Twelve hours of archived video footage were used to examine the bond between the two mother-calf pairs. Video sessions previously recorded by different observers ranged between 10 to 15 minutes in length. Four video recordings were selected from every other month from a total of 200 archived video recordings of the two calves. All video recordings were independent focal follow observations of each calf.

The videos were selected based on the quality of the visibility ascertained by an independent coder. Once selected, each video was coded by a single coder for behavioral parameters. A transcription of the video was created upon the viewing of each video so the frequency and duration could be recorded for mother-calf swims, independent or exploratory behaviors, social interactions, and attachment behaviors (Table 1). To be as accurate as possible every second of the session time was accounted for in the video. Thus when the focal mother-calf pair was out of view of the camera for longer than 10 seconds that period was considered as non-visible time and the time was then removed from the total session time creating a new variable labeled usable time. All duration data were converted to percentages to represent the amount of time spent in a given activity (percent of time = (duration of activity/usable time)*100).

The first year of life was divided into three developmental periods that corresponded with changes in rearing experiences. Four sample points were obtained for each calf at one month and three months for all behavioral categories of interest. Data from each behavior of interest during the second half of the year were averaged for each month (i.e., five months, seven months, nine months, and eleven months) to create four independent means for each calf representing the third developmental period examined.

Table 1

Operational Definitions for Target Calf Behaviors

Target Behavior	Operational Definitions
Mother-Calf Pair Swim	Mother and calf swim within 1m of each other and are synchronized
Mother-Calf Infant	Calf swims directly below the mother, positioned near the mammary
Mother-Calf Echelon	Calf swims parallel to the adult, near the dorsal ridge and slightly staggered
Mother-Calf Affiliative	Mother and calf float within the same general area of each other
Calf-Calf Affiliative	Calf and other available calf float within the same general area of each other.
Independent Activities	Calf swims independently of other available swims
Secure Base	Amount of separation between mother and calf, reunions, orientations, and contact
Safe Haven	Reunions between calf-mother during anxiety provoking situations, aggressive interactions, threats, fatigue and illness

Note. All mother-calf activities were collapsed into the pair swim category, both mother-calf and calf-calf interactions were collapsed into the affiliative interactions category.

Results

Activity Budget

Three different activity budgets were used to examine the developmental differences between SAM and STEL. SAM was paired with a surrogate mother for his first month when he did not initially bond with his mother, LUN. By three months SAM was reunited with his biological mother and remained with her for the rest of the first year. Due to the differences in rearing, the first month of life and the third month of life were analyzed individually. Once both calves began to show similar behavioral trends the remaining half of the year was collapsed for analysis.

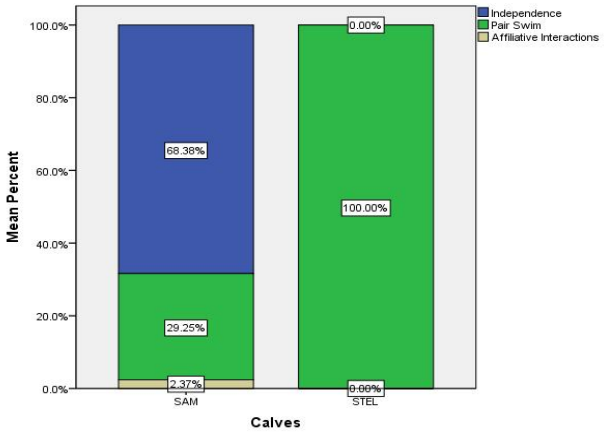

Figure 1. Activity Budget displays the percentage of time each calf spent in three major categories of calf behavior in the first month of life when SAM was paired with surrogate mother.

As Figure 1 demonstrates SAM engaged in more independent swims and activities throughout month one when paired with the surrogate mother. Although very independent, he spent almost 30% of his time in pair swims with the surrogate mother. In contrast, STEL was observed to spend all of her time in a pair swim with her mother during the first month.

Figure 2 displays the activities of each calf during the third month of life when both were now paired with their biological mothers. SAM engaged in more pair swims with his mother (54%, Figure 2) in month three compared to month one when he was paired with his surrogate mother (29%, Figure 1). STEL continued to exhibit a greater amount of pair swims in month three but began to explore and swim independent of her mother. However, STEL spent half as much time in independent swims as SAM.

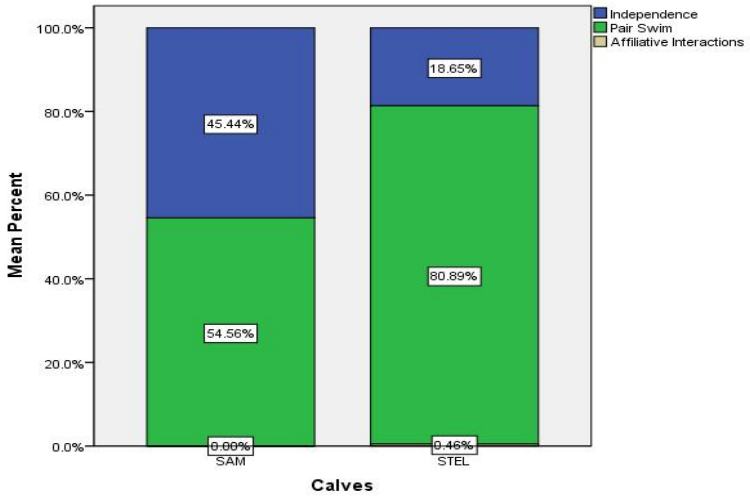

Figure 2. Activity Budget displays the percentage of time each calf spent in three major categories of calf behavior in the third month of life when SAM was reunited with his mother.

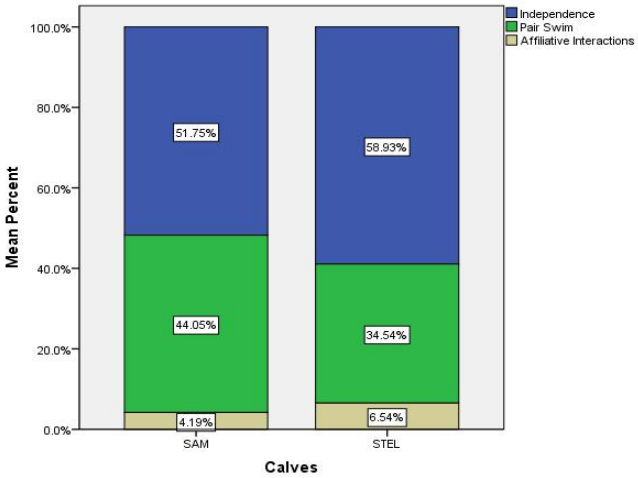

Figure 3.
Activity Budget displays the percentage of time each calf spent in three major categories of calf behavior between 5-11 months when both calves were bonded with their mothers.

Figure 3 displays similar developmental trends between the two calves from five to eleven months. From what was observed SAM began to exhibit a more evenly distributed time between independent swim and pair swims with his mother but began to display some affiliative interactions (4%). STEL altered her behavioral patterns by spending the majority of her time in independent swims but continue to spend a third of her time in pair swims with her mother. STEL began to display some affiliative interactions as well (6%).

Developmental Trends

A series of 2 (calf) x 3 (age of calf) mixed ANOVA was used for both mother-calf pairs to assess the influences of each individual calf and the age of the calf on three dependent variables: independence, pair swim, and affiliative interactions. To achieve equal sample size for the repeated measures analysis the observations from months five through eleven were averaged for each month to produce a unique mean for each month. These four means represented the observation points used in these analyses.

Table 2

Mean percentages and standard deviations across the first year of life per calf

		Months		
Animal		1	3	5-11
SAM				
	Independence	68.2 (43.1)	46.6 (41.1)	52.2 (9.4)
	Pair Swim	29.1 (44.5)	56.0 (38.3)	45.0 (16.5)
	Affiliative Interactions	2.4 (2.8)	0.0 (0.0)	4.3 (1.7)
STEL				
	Independence	0.0 (0.0)	18.6 (26.1)	58.2 (6.1)
	Pair Swim	100.0 (0.0)	80.5 (26.2)	34.0 (7.0)
	Affiliative Interactions	0.0 (0.0)	0.5 (0.9)	6.4 (3.4)

Note. Mean(*SD*) are presented above.

Independence

A significant interaction was found between individual calf and age of calf for independent swim, $F(2, 12) = 5.25$, $p = .023$, $\eta^2 = .467$ (Table 2 and Figure 4). A One Way ANOVA Post Hoc analysis with within-subjects contrast indicated that SAM (68.2%) swam independently a greater percentage of his time than STEL (0%) at one month, $F(1, 3) = 10.03$, $p = .051$, $\eta^2 = .77$. No other significant differences emerged. There was no main effect for age of calf on independence at each designated developmental periods, indicating that there was no significant differences in time spent in independent and exploratory activities. However, a Pearson's correlation indicated that as age of calf increased independent swims increased, $r(46) = .31$, $p = .034$.

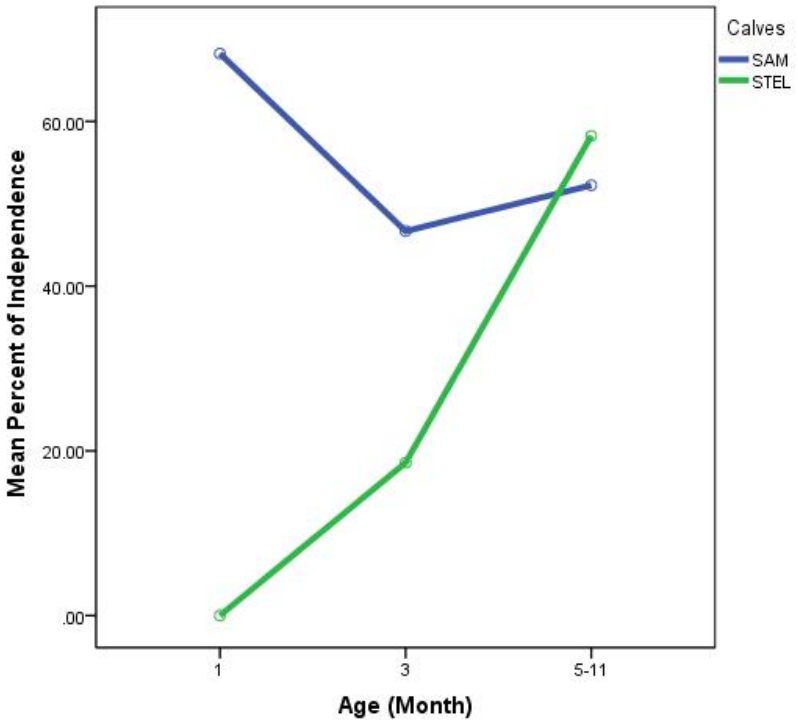

Figure 4. Mean percent of time for independent activities per calf across one month, three months, and five to eleven months.

Pair Swim

A significant interaction was found between individual calf and age of calf for pair swim, $F(2, 12) = 6.15$, $p = .014$, $\eta^2 = .506$ (Table 2 and Figure 5). A One Way ANOVA Post Hoc analysis with within-subjects contrast indicated that SAM (29%) swam less in pair swims at one month than STEL (100%) swam with her mother at one month, $F(1, 3) = 10.13$, $p = .05$, $\eta^2 = .77$. There were no other significant differences between age of calf and the calf. The main effect for age of calf and pair swim did not achieve statistical significance, $F(2, 12) = 3.58$, $p = .06$, $\eta^2 = .38$. However, a Pearson's correlation indicated that as age of calf increased pair swim decreased, $r(46) = -.34$, $p = .017$.

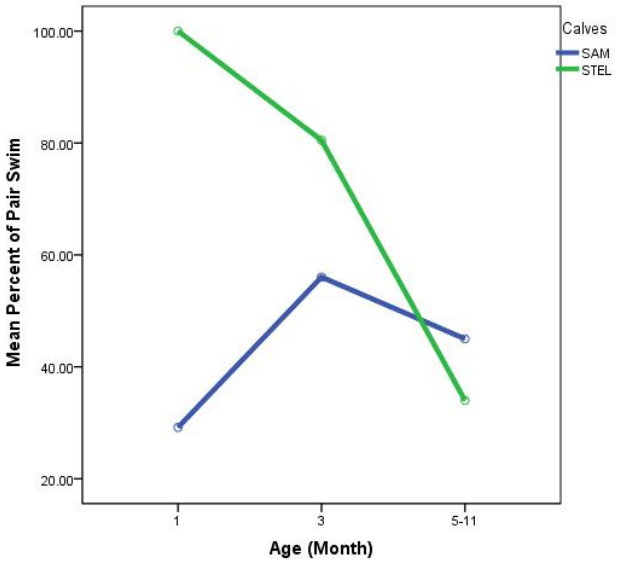

Figure 5. Mean percent of time for pair swims with mother per calf across one month, three months, and five to eleven months.

Affiliative Interaction

No significant interaction was found between individual calf and age of calf for affiliative interactions, $F(2, 12) = 2.20$, $p = .15$, $\eta^2 = .27$ (Table 2 and Figure 6). There was an overall main effect for age of calf for affiliative interactions, $F(2, 12) = 12.48$, $p = .001$, $\eta^2 = .675$. A LSD Post Hoc analysis indicated that the time the calves spent in affiliative interactions was significantly greater during five to eleven months ($M = 5.4\%$, $SD = 2.7\%$) than either one month ($M = 1.2\%$, $SD = 2.2\%$) or three months ($M = 0.23\%$, $SD = 0.65\%$) (Figure 6).

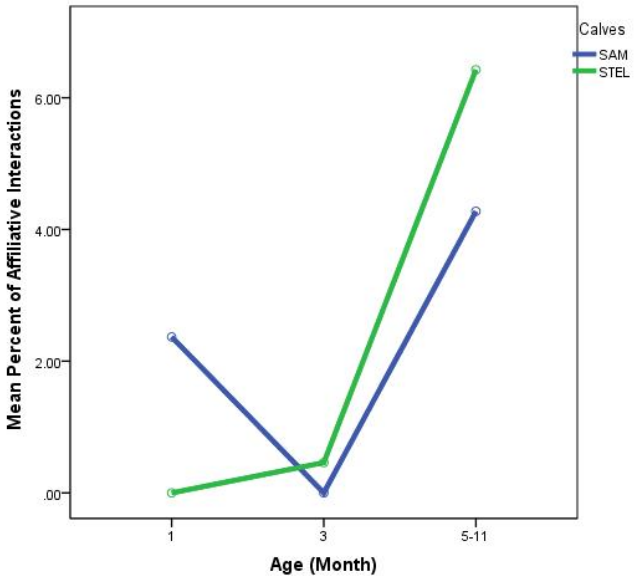

Figure 6. Mean percent of time for affiliative interactions per calf across one month, three months, and five to eleven months.

Attachment Behaviors

To examine the frequency with which the calves use their caregivers from which to explore or return during distressing events the secure base and safe haven use were examined for the first year of life. At one month when SAM was paired with the surrogate mother he exhibited two secure base uses and no safe havens. Once SAM reunited with his biological mother he displayed 14 secure base uses and 4 safe havens. In comparison, STEL did not show any secure base or safe haven use in the first month of life. She did exhibit five secure base uses and three safe havens for the rest of the first year of life. When the attachment behaviors were aggregated for each calf SAM (n = 20) displayed significantly more attachment behaviors than STEL (n = 8), binomial test, p = 0.38 (Figure 7).

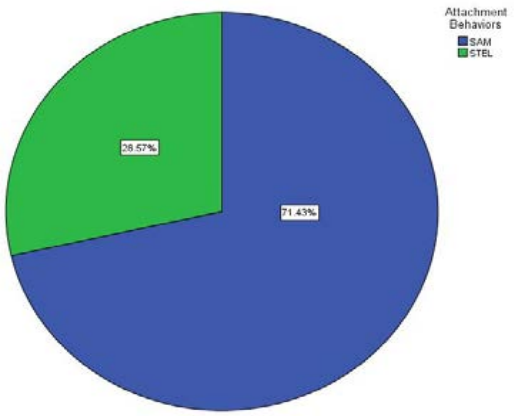

Figure 7. Percent of attachment behaviors for each calf for the first year of life.

Discussion

Two case studies were examined to further evaluate the use of attachment theory to describe the mother-calf bond in belugas. The first year of life was divided into three time periods that corresponded to significant rearing differences experienced by each calf. Immediately after birth, a bond did not appear to form between SAM and his biological mother, LUN. In response to this situation animal care management made the decision to pair SAM with a surrogate mother, MAR who had previously reared one successful calf. He remained with the surrogate throughout his first month of life. Two and a half weeks following the birth of SAM another female calf was born, STEL to her mother CRI who had previously reared two successful calves. This birth provided LUN with opportunities to observe the interactions between a typical mother-calf pair. Within a few days of the birth of STEL, SAM and LUN were reunited in the presence of MAR. The weeks that SAM was with the surrogate represent the first month of data. The second time period represented the third month of life for both calves, which allowed SAM to form a bond with his biological mother for two months and STEL to reinforce her bond with her mother. The final period represented the aggregate of months five through eleven for each calf as both calves displayed similar patterns of behaviors across the second half of the first year of life.

The results of these two case studies provide insight into the question if a mother-calf bond is best explained by the mechanism of imprinting or attachment. If the mother-calf pair bond was an imprinted bond it was expected that the mother would provide the basic necessities for the calf such as food procurement (nursing) and protection. If the bond was both an

imprinted bond and an attachment it was expected for the mother to provide food, protection, comfort, and security for the calf through safe haven and secure base use. The first goal of the study was to examine the overall pattern of interactions for each calf. Specifically independent swim, pair swims with their mother, and affiliative interactions were selected because they could help illustrate the existence of a bond between a mother and a calf. The second goal of the study was to examine if the pattern of these activities changed over time. The third goal for this study was to then examine if the calves demonstrate attachment behaviors during the first year of life, providing an opportunity to discriminate between imprinting, attachment, or both explanations as a mechanism for the mother-calf bond. The final goal of the study was to determine if individual differences in patterns of behaviors related to the calves' different rearing experiences or developmental age.

Overall Behavioral Patterns

At one month the calves exhibited very different patterns of behavior. SAM displayed a greater amount of independent swimming than what was expected from previous research examining calves with typical development (Hill, 2009; Hill et al., 2013). In comparison, STEL exhibited no independent swims or exploratory behavior during her first month as was captured in the selected archived recordings. Instead mother-calf pair swims were overrepresented for STEL and CRI as they spent all of their first month observations swimming together. Mother-calf pair swim is an important activity for the development of a mother-calf bond, which is illustrated by SAM spending a third of his time in pair swims with the surrogate mother, MAR. By three months when both calves had been paired with their biological mothers for at least two months both calves began to show similar developmental trends with SAM developing at a slower rate than STEL. By the end of the first year of life SAM reached a similar developmental trend as STEL (Figure 3). These results supported trends observed in earlier studies of beluga calf development in human care and in the wild (Castaneda, 2013; Hill, 2009; Hill et al., 2013; Krasnova et al., 2006, 2009). In particular, one study using the same coding procedure for the same beluga population produced a pattern of independence and affiliative interactions that differed slightly from the current study (Castaneda, 2013). The mother-calf pairs from the previous study displayed a greater percent of time in affiliative interactions and a smaller percent of time in independent activities compared to the calves from the current study. It is possible that the social composition, the individual calves themselves, or their early rearing experiences may have influenced these patterns.

Unlike STEL, SAM displayed a small percent of time (2%) engaged in affiliative interactions with his surrogate mother. STEL did not exhibit affiliative interactions until after three months of life. The affiliative interactions displayed by SAM in the first month may have been his attempt to initiate interactions with the surrogate female, MAR. These interactions may have facilitated opportunities for SAM to follow and swim with MAR. Previous research with bottlenose dolphins has indicated that neonates have a very strong following response to their biological mothers, suggesting the possibility of imprinting (Mann & Smuts, 1999). When his biological mother did not attempt to swim with SAM immediately after birth, SAM's response was to swim and float independently. Being paired with MAR within three days of birth allowed him the opportunity to practice the following

behavior. Following an adult female for beluga calves may have allowed SAM the opportunity to form a bond with a beluga instead of a human or an inanimate object when first learning to swim and interact with his environment.

Developmental Trends

The developmental trends observed for independent swims and exploratory behaviors, mother-calf pair swims, and affiliative interactions generally followed the previously established patterns (Hill, 2009; Hill et al., 2013). However, some individual differences did emerge at the first and third months of life. When SAM was paired with the surrogate mother at one month he spent two-thirds of his time in independent activities as compared to STEL who exhibited no independent activities at one month. While the previous studies of beluga calves indicated that calves can be independent shortly after birth they typically spend the majority of their time with their mother and increase in independence by the end of the first year of life (Hill, 2009; Hill et al., 2013; Krasnova et al., 2006, 2009). SAM deviated from the typical pattern even when paired with a surrogate. Once reunited with his biological mother SAM began to display more mother-calf pair swims which reduced his time in independent activities to more age appropriate levels. By the end of the first year of life both calves demonstrated increasing levels of independent activities and decreasing levels of mother-calf pair swims. As expected from previous research with belugas (Hill, 2009; Hill et al., 2013; Krasnova et al., 2006, 2009) the amount of affiliative interactions increased by the end of the first year of life. While the affiliative interactions with SAM in the first month were primarily with his surrogate mother MAR the affiliative interactions observed by the end of the first year of life occurred primarily between the two calves. SAM, did not initially respond to STEL's attempts to initiate affiliative interactions but when averaged across the last half of the first year each calf engaged in affiliative interactions at similar levels (Figures 3 & 6).

Attachment Behaviors

The findings from a previous study suggested that the mother-calf bond is considered one of the strongest and most durable relationships in cetaceans, supported by the amount of time calves remain with and near their mothers (Krasnova et al., 2006). Some scientists believe that this bond is due to imprinting (Mann & Smuts, 1999); however, an attachment may better describe the patterns of behaviors observed between a mother and a calf. An imprinted bond is one that happens in a limited time frame via specific sensory systems and is irreversible once outside the critical period. In comparison, an attachment is developed over an extended period of time, with a specific caregiver, and reciprocal interactions between the caregiver and offspring (i.e., secure base and safe haven). Safe haven and secure base are critical features of attachments. Previous research with humans and nonhuman primates indicated that proximity increases both physically and psychologically as the infant ages because the attachment system is centered on helping the infant feel safe and secure (Solomon & George, 1996).

If the bond between a beluga mother and calf is an imprinted bond, the following behavior is essential for the formation of a bond between the caregiver and the calf. SAM's ability to follow both the surrogate and his biological mother at different developmental time periods suggest that perhaps imprinting is not the sole mechanism for the bond between beluga mother-calf pairs. Specifically, while the surrogate provided nourishment and

protection for SAM, he shifted his preferred caregiver from the surrogate to his biological mother at a developmental age (post three weeks) that would typically be beyond the limited window for an imprinted bond (typically one to five days depending on the species). Additionally, as evidence for the development of an attachment SAM did display two secure bases when paired with the surrogate mother at one month. An attachment-based bond was further supported upon reunion with his biological mother as SAM displayed an additional 14 secure base uses and four safe havens with her. Although, STEL did not show any secure base or safe haven use at one month she did exhibit five secure base uses and three safe havens for the rest of the first year of life. Both secure base use and safe haven use increased by the end of the first year of life. This pattern suggests that while the calves are becoming more independent they still return to their mothers frequently, possibly for comfort and security. These results corroborate by Castaneda (2013) in which the four mother-calf pairs exhibited attachment behaviors with similar frequencies and developmental changes as the current study.

Differences in Rearing Experiences

Previous research with cetaceans has suggested that maternal styles vary between mothers and may produce different long-term outcomes (Gibson & Mann, 2008; Hill et al., 2007; Mann & Smuts, 1998). Mothers with limited experience do not always have successful rearing strategies. For example, SAM's biological mother did not respond to SAM's initial following attempts or to his inefficient swimming efforts. This lack of response may have been influenced by her first calf experience when the calf failed to respond to LUN's effort to swim with her calf. Ultimately, LUN did not bond with her first calf which may have negatively affected her maternal care strategies. After LUN observed a mother-calf pair that exhibited typical mother-calf interactions she was able to respond more appropriately to her biological calf's attempt to swim with her. The calf's attempt to swim with his biological mother may have not been possible if he had not been paired with the surrogate mother MAR. When contrasted with STEL's developing bond with her experienced and protective mother CRI, SAM's case argues for the development of a bond based on attachment rather than an imprinting. With the appearance of secure base events during the initial bond formation with MAR and the shift of preference to his biological mother upon reunion at the end of the first month of life an attachment explanation may best represent the bond formed between beluga mothers and calves.

Limitations and Implications

Several limitations existed that should be addressed by future research. First, there a limited sample size due to the selection process used to choose the archived recordings and the number of available mother-calf pairs ($N = 2$). While this method allowed for the best videos possible to be coded, it limited the sample. Second, nursing was not measured in the current study due to visibility issues. While this activity is a vital aspect of imprinting and attachments, nursing is difficult to record because of light glare and angle of the recordings. Future studies should include this component to develop a complete picture of the factors influencing bond formation.

Additionally, more mother-calf pairs from different facilities and environments should be evaluated to form an accurate representation of the behaviors critical to classifying the mother-calf bond. Larger samples would add variation to behavioral patterns and would help clarify the nature of

the bond between mothers and calves. While the study had a limited sample size it provided a unique perspective to the current literature with the differences in rearing experiences that occurred for the two calves. One important outcome of this study was the importance of both the mother and calf initiating and reciprocating critical behaviors in the bond formation (e.g., following behavior by the calf, interest in and acceptance of the calf by the mother, proximity maintenance, nursing, and specific attachment behaviors). Another important outcome was the knowledge gained about the timing regarding the development of the beluga mother-calf bond. Specifically, there appears to be flexibility in the time frame in which calves must develop a bond with a caregiver, suggesting more of an attachment based bond than an imprinted bond. Future research should examine the developmental timeline of attachment formation in belugas as they may show similar developmental trends observed in other mammals (e.g., caregiver discrimination by human infants as they develop, Ainsworth, 1964, 1969; Isabella et al., 1989).

The results of this study validate the use of surrogate mothers when calves or mothers fail to bond with one another. It highlights the importance of maintaining the bonded mother-calf pair in proximity of one another until the calf has reached certain developmental periods (e.g., weaning) or activities involving the mother or the calf (e.g., medical procedures, training sessions). Animal care management should evaluate each individual mother-calf pair when making decisions about social groupings and separations.

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For Better or Worse: Cooperation in Married and Dating Relationships

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Abstract: *Social dilemmas have been used to examine cooperation and conflict amongst people. The present study investigates the role of cooperation in the duration of romantic relationships using social dilemmas. The pattern on a scatterplot indicates that cooperation plays a role in relationship duration of dating couples after 6 years, although the pattern is not statistically significant. Additionally, certain factors related to conflict and Big Five personality dimension were found to be statistically significant with relationship length. There is no discernable pattern in cooperation and relationship duration in married couples.*

For Better or Worse: Cooperation in Married and Dating Relationships

According to the New Oxford American Dictionary, cooperation is defined as "the process of working together to the same end" (New Oxford American Dictionary, 2010). Cooperation plays an important role in many aspects of social interaction. Factors that are positively correlated with social interactions have been found to individually correlate with factors affecting relationships between people. When asked to create a generic ideal person, cooperation was rated as a highly important trait. In fact, cooperation was consistently ranked as one of the most vital traits necessary in a hypothetical partner in a number of different social relationships ranging from close friend to employee (Cottrell, Neuberg. & Li, 2007). Yet, research on cooperation and romantic relationships specifically is lacking.

Cooperation has been examined using social dilemmas, which are situations where an individual is made to choose between collective and personal interests. In social dilemmas, a person can choose to be uncooperative and benefit him or herself, or choose to be cooperative and aid a collective group for a smaller payoff. However, if all individuals in the group choose the uncooperative option, they are all consequently in a worse situation for it. In essence, social dilemmas can be used to measure what people will decide when they are aware that the outcome of a choice will affect both themselves and others (Axelrod, 1984). In the current study, variations of the Prisoner's Dilemma, the public goods dilemma, and the resource dilemma were used to measure cooperation.

The Prisoner's Dilemma has been used to study a number of topics including similarity (Fischer, 2009), trust (Balliet & Van Lange, 2013a), and reciprocity (Komorita, Parks, & Hulbert, 1992). In the Prisoner's Dilemma, two people are given the choice to either cooperate or defect. Participants are not allowed to speak with one another, and they only find out the partner's answer after each has made a final decision. There is payoff for defection

regardless of the other person's choice to defect or cooperate, and the maximum reward for individuals is presented if they choose to defect while the other individual chooses to cooperate. Both players receive the smallest reward if they both decide to defect (Axelrod, 1984).

In a public goods dilemma, an individual can use a community resource without contributing to it. However, if everyone makes use of the public resource without contributing to the resource, the resource will effectively 'run out'. For example, people may benefit from the use of a public pool, and yet they have the choice to contribute money to maintain the upkeep or not. In a resource dilemma, there is a shortage of a resource needed by a group. It is in the group's best interest to conserve these scarce resources, but it is in the individual's best interest to use as much of the resource as they can (van Dijk, de Kwaadsteniet, & Cremer, 2009). Ultimately, social dilemmas look at the decisions people will make, whether to cooperate and coordinate choices for the good of the group or to self-benefit. Cooperation as a whole can be measured using social dilemma scenarios, but there are a number of underlying traits that affect cooperation.

One important facet of cooperation is compassion. Compassion has been defined by Goetz and colleagues as "…the feeling that arises in witnessing another's suffering and that motivates a subsequent desire to help" (2010, p. 1). Feeling compassion towards another may affect cooperation, regardless of the relationship between individuals. It has been theorized that compassion emerged as a way of facilitating cooperation and trust with 'non-kin', or those who are not blood relatives (Balliet, Li, Macfarlan, & Van Vugt, 2011). Expectations of behavior from others in the group are strong indicators of cooperation. Touch and voice cues can also increase cooperative behaviors. People will engage in cooperative behaviors as long as it is believed that the other individual will reciprocate the cooperative behavior. Compassion is elicited primarily in response to negative, rather than positive, events or emotions displayed by others. Cooperation norms are vital in maintaining feelings of compassion towards an individual. (Goetz, Koelter, and Simon-Thomas, 2010).

Similarity amongst people has also been found to play a significant role both cooperation and in relationship duration. Studies have shown that perceived similarity with others contributes to both altruism and emotional closeness with others (Riolo, Cohen, & Axelrod, 2002; Curry & Dunbar, 2013). Curry & Dunbar found that quantity over quality is the predictor; It is not the nature of the shared interests that is important, but instead the number of shared interests. Individuals with similar interests may be more likely to seek common goals, which could serve as an explanation for the findings (2013). In married couples, both partner's personalities have been found to contribute to higher relationship satisfaction (Dyrenforth, Kashy, Donnellan, & Lucas, 2010). Perceived similarity with others has significant impact on cooperative behavior, while a lack of perceived similarity seems to breed conflict. Similarity is a key factor in whether cooperation will occur, especially when cooperation is required with non-kin**.**

Conflict, cooperation, and the quality and duration of relationships also share close ties. Different situations offer differing levels of conflict, which in turn has an effect on cooperation. When conflict is low in a situation, cooperation is high, and when conflict is high, cooperation is low. When people are faced with negative or destructive situations as a result of others, the strong impulsive reaction is to react negatively in

turn. In this way, conflict breeds conflict. A greater likelihood of diffusive behaviors when presented with negative behaviors can occur, and is more likely in relationships with greater relationship satisfaction, more perceived time investment, more commitment, and when partners are more willing to attempt to perceive issues from a partner's perspective (Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991). Although conflict may lead to conflict, cooperation also seems to lead to cooperation, resulting in decreased amounts of conflict (Balliet & Van Lange (2013b). In relationships, higher amounts of conflict result in lower relationship satisfaction. The idea of the dilemma remains the same, so that increased cooperation leads to decreased payoff, but also results in increased average payoff for both participants (Le & Boyd, 2007).

Conflict and cooperation involve a factor of trust. People engage in more cooperative behaviors when cooperative behaviors from others are expected. Trust has been found to affect cooperative behaviors and social relationships. Much as is the case with compassion, trust has been used as a broad term. According to Rousseau, Sitkin, Burt, & Camerer, trust can be defined as "…the psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998, p395). Individuals who are more trusting have been found to engage more frequently in cooperative behaviors than individuals who are less trusting (Balliet & Van Lange, 2013b). In relation to romantic relationships, studies have found that higher trust leads to both greater commitment and satisfaction in relationships (Campbell, Simpson, Boldry, & Rubin, 2010). Trust was also found to be more indicative of cooperation in situations with higher conflicts of interest between the individual's personal interests and the interests of the group (2013b). Without trust, conflict increases and cooperation will not occur.

Certain personality characteristics have also been found to increase or decrease cooperation. A common conceptualization of personality is that of the Big Five personality model. Tupes and Christal found that what were originally 35 personality traits could be narrowed down into five broader personality dimensions (Tupes & Christal, 1992). In married couples, neuroticism was found to be higher in distressed couples than in non-distressed couples. Distressed couples also displayed significantly lower degrees of Agreeableness and Conscientiousness. Openness and Extraversion were not correlated with marital distress (Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010). Lower levels of neuroticism and higher levels of agreeableness and conscientiousness were also found to have small but significant relationships with marital satisfaction (Gattis, Berns, Simpson, & Christensen, 2004).

Although there are a variety of studies about group or familial cooperation, there is little research investigating whether there is a correlation between cooperation and aspects involved in romantic relationships specifically. Past research has clustered romantic and familial relationships together based on factors such as interaction, relationship duration, and permeability, classifying both as intimacy groups. While it is noted that intimacy groups have unique characteristics differentiating them from other social relationships such as those shared with friends or coworkers, there is no real distinction made between familial and romantic relationships (Lickel et al, 2000).

The purpose of this study is to investigate the role of cooperation in the duration of romantic relationships. It is hypothesized that participants who score higher in social cooperation overall as measured by expected performance in a social dilemma will have longer lasting relationships than people who score lower in overall social cooperation. It is also hypothesized that participants with higher Big Five scores in Conscientiousness and Agreeableness, along with lower scores in Neuroticism, will report higher relationship satisfaction. In addition, participants with higher relationship satisfaction and more perceived social support will have longer relationships. Finally, it is hypothesized that increased relationship-specific conflict scores will be negatively correlated with relationship length.

Method

Participants

One hundred thirty three participants were recruited at a mid-sized southwestern university (N = 133). The final sample included 39 males (29.3 %), 92 females (69.2%), and 2 individuals who did not select either option (1.5%). The mean age of respondents was 30.86, with ages ranging from 18 to 63 (SD = 11.769). The ethnicity of participants was reported as 104 Latino/Hispanic (78.2%), 22 White (16.5%), 6 African American (4.5%), and 1 individual who did not indicate an ethnicity (0.8%). Of the total sample, 97 individuals reported currently being in a relationship. From the 97 people in relationships, 50 reported currently being married (37.6%). Twenty-three people from the total sample had previously been divorced (17.3%). The average length of marriage reported was 12.66 years, while the average length of dating relationships was 2.91 years.

Materials

Relationship satisfaction was measured using the Relationship Assessment Scale (RAS; Hendrick, 1988). The RAS is a seven-item questionnaire that measures the overall relationship satisfaction. An example of a question appearing on the RAS is, "How well does your partner meet your needs?" Participants choose a response based on a 5-point Likert scale ranging from 1 (low satisfaction) to 5 (high satisfaction). Two items are reverse coded before scoring. The seven items are averaged together, resulting in a total between 1 and 7, with higher scores indicating greater relationship satisfaction. Cronbach's alpha for the seven measured items was found to be .86.

Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS; G. Zimet, Dahlem, S. Zimet, & Farley, 1988), a 12-item scale. Items are calculated using a 7-point Likert-type scale ranging from 1 = very strongly disagree to 7 = very strongly agree. Participants are asked how strongly they agree or disagree with statements such as, “There is a special person who is around when I am in need.” Scores from the 12 items are summed to result in a number between 12 and 84 with higher scores indicating higher degrees of perceived social support. Items were coded so that four are related to familial support, four to social support, and four to friend support. Cronbach's alpha has been determined to be .89, and test-retest reliability is .85.

Conflict was measured using the Romantic Partner Conflict Scale (RPCS; Zacchilli, C. Hendrick, & S. Hendrick, 2009), a 39-item scale that uses a 7-point Likert scale ranging from 1 = very strongly disagree to 7 = very strongly agree. The primary purpose of the RPCS is to measure for conflict experienced by romantic couples in day to day life. A sample question reads, “My partner and I collaborate to find a

common ground to solve problems between us." Scores are calculated by calculating the mean for all questions, with lower scores indicating increased conflict. The RPCS is made of six subscales, Compromise (α = .95), Domination (α = .87), Avoidance (α = .82), Submission (α = .82), Separation (α = .83), and Interactional Reactivity (α = .82). Test-retest correlations have found the RPCS to be stable, with results as follows: Compromise (.82), Domination (.85), Avoidance (.70), Submission (.72), Separation (.76), and Interactional Reactivity (.85).

Big 5 factors of personality were calculated with the Mini International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006), a 20-item scale of measurement used to determine an individual's Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Intellect/Imagination. A typical item reads, "I am the life of the party", and participants are asked to indicate how well the statement applies ['to indicate agreement or disagreement with the statement' instead of 'how well the statement applies'?] Items were scored using a 5-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. Each factor of personality is associated with some positively keyed and some negatively keyed items. 11 items were reversed scored, so that when each of the five personality factors were summed higher numbers indicating a greater degree of the personality trait. The Mini-IPIP has been found to have good validity, with coefficient alphas for the five factors being: Extraversion = .77, Agreeableness = .70, Conscientiousness = .69, Neuroticism = .68, Intellect/Imagination = .65. Test-retest reliability was also found to be high, with results for the five factors as follows: Extraversion (r = .86), Agreeableness (r = .68), Conscientiousness (r = .77), Neuroticism (r = .82), and Intellect/Imagination (r = .75). The Mini-IPIP has validity and reliability scores comparable to larger scales such as the IPIP-FFM and the IPIP-NEO. `

The investigators created three social dilemma scenarios to measure cooperation (see Appendix). Participants were asked to respond to three hypothetical scenarios using a four-point Likert type scale. Scores from the scenarios were averaged which resulted in final number between 1 and 4, with higher scores indicating greater cooperation. Participants who scored lower than 2.5 were labelled as low cooperators, participants with scores greater than 3.0 were labelled as high cooperators. Six participants who received scores in the middle were left out of the final analysis. Test-retest reliability was found to be .59

Procedure

Participants were informed of the online survey through email. After reviewing and agreeing to the consent form, participants were asked to answer some demographic questions and given several measures to complete. The survey took roughly 30 minutes to complete. Students in select psychology courses earned extra credit. The 'snowball' technique was used to get a wider range of responders, so that participants in psychology courses could earn additional extra credit by having friends and family take the survey. In addition, Facebook posts with the survey link were used to recruit participants.

Results

Hypotheses were tested using Pearson Product Moment Correlations and independent samples t-tests. A correlation between cooperation and marriage length resulted in no statistical significance. The same was true for cooperation and dating length. However, as seen in Table 1, a relationship between dating length and

cooperation was observed. There appears to be a break in the data so that only cooperators (determined to be people who received cooperation scores of 3.0 or greater), remain in relationships. Despite this, there was no statistically significant pattern in the data.

Our second hypothesis was proven partially wrong. The only relationship found between Big Five personality factors and relationship duration was with the personality dimension of conscientiousness. There was a significant correlation between conscientiousness and relationship duration in dating, but not married couples, $r(44) = .342$, $p < .023$.

The six factors outlined by the Romantic Partner Conflict Scale were individually correlated with cooperation. Independent sample t tests were used to determine the relationship between the six conflict strategies outlined by the Romantic Partner Conflict Survey and cooperation. Of the six factors, two factors were found to have moderately strong relationships with cooperation. Higher scores of separation, or the conflict strategy of walking away from an argument to calm down, was also found to have a significant negative correlation with cooperation, $r(114) = -.339$, $p < .0001$.

In order to analyze the data using independent samples t tests, cooperation was dichotomized so that participants who scored above 3.0 for cooperation were classified as cooperators ($N = 85$), participants who scored less than 2.5 were non-cooperators ($N = 24$), and participants who fell in the middle were left out of the analysis ($N = 4$). Participants who were determined to be cooperators scored significantly lower in domination, $t(113) = 2.451$, $p = .016$. The scale describes dominance as the conflict strategy involving the need to control or attempt to change another's decisions to be more in line with the dominator's interests.

Interestingly, age and interactional reactivity were also found to have a significant relationship, $r(113) = .360$, $p < .0001$. As stated by Zacchilli, Hendrick, and Hendrick, "Interactional reactivity is characterized by verbal aggression, emotional volatility, and lack of trust between partners" (2009, p1083). Interactional reactivity was also found to have a positive significant relationship with marriage length, $r(48) = .349$, $p < .015$. Cooperation and interactional reactivity have a negative significant relationship as determined using an independent samples t test, $t(108) = 1.375$, $p = .002$. Relationship satisfaction as determined by the Relationship Assessment Scale was also found to have a strong negative correlation with interactional reactivity, $r(114) = -.516$, $p < .000$. Relationship satisfaction and marriage length shared a strong negative correlation, $r(49) = -.493$, $p < .000$. Age and social support determined using the Multidimensional Scale of Perceived Social Support has a weak, but significant negative correlation, $r(114) = -.267$, $p < .0003$. Older participants are reported as being more volatile, receiving less social support from spouses, and behaving less cooperatively while still maintaining long term relationships.

Finally, a positive relationship was found between cooperators and participants who have been divorced, $t(22) = 3.611$, $p < .0001$. However, the results are somewhat inconclusive due to the relatively small sample size.

Discussion

The results of the survey partially support previous findings on relationship length and cooperation. The relationship held true in dating couples, but was untrue in married couples. What was interesting

was that the break in data reported in the previous study was once again observed in dating couples. Furthermore, the break was at roughly the same position as the other study reported (between 5 – 6 years). However, further analysis revealed no statistically significant pattern to verify our hypothesis. Further research might look to increase sample size, as the pattern displayed with the scatterplot (Figure 1) may have been caused by the small amount of non-cooperators.

The relationship between Big Five personality dimensions and cooperation was also only partially verified. Conscientiousness and relationship length were found to share some significance, but the other dimensions of personality did not. Overall, the study served to further our understanding of cooperation and the factors that contribute to relationship length. The current study was limited by time constraints. As the present study was part of a research project, there was a small window for data collection to occur. With additional time, more participants could have been recruited to take part in the research.

Other possible avenues for future research include expanding on cooperation in divorced individuals. Although a significant relationship was found between divorced individuals and cooperation, the sample size was too small to conclusively determine if the results would hold up with a broader sample. A possible explanation for the relationship is that divorce causes people to reevaluate the reasons behind a failed marriage. However, this explanation is purely speculative. Further research might look at increasing the sample size and rerunning the analysis. Additional personality and interpersonal relationship measures might also be of interest.

One of the most interesting statistical finds was between age and interactional reactivity. Against what we would have predicted, aggressive and hostile conflict strategies seem more prevalent amongst older and married couples. Previous research has indicated that such behaviors should lead to a dissolution of possible romantic relationships under such circumstances, and yet people continue to stay married despite such behaviors. This opens up the possibility for future study into negative relationship characteristics in married couples. The RPCS makes no mention of age, which leaves age as a possible continuation from the present study. Despite what we may have hypothesized, it would seem that although many of the married couples in our sample have been in a relationship for a number of years and seem set to continue to remain married, the factors that would indicate a satisfying relationship are not present in the sample couples.

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Appendix

Item	Text
1	You are staying in a hotel at a conference for 4 days with people that you have not met before. They all do what you do, but in different states. There are four people in the room. The hotel allowed only one hour of internet access for each room per day. After one hour, the internet stops working. The timing starts over every night at midnight. On Day 2, everyone in your room went to sleep at 11 except for you. Around midnight, you get online. No one knows you are up, and you realize that no one is monitoring your internet use. What would you do?
2	Everyone at your place of business gets to benefit from the water cooler. You DO plan to drink from it just as much as anyone else. However, the company does NOT provide you with a water cooler free of charge. Employees are asked by a fellow employee who has taken the lead in the water project, to donate money anonymously into a box outside her office so that the water can be ordered each month. Anyone is allowed to use the water cooler. No one writes down who has donated. What do YOU do?
3	You and a friend both cheated on a test together. Your professor suspects you have cheated and calls each of you, individually, into his office without giving you time to discuss it with each other first. If neither of you confess to cheating, your professor will believe you and nothing will happen. If you confess and your friend confesses, you will each get an F for the class. If you confess and your friend does not confess, you will get an F for the test only, and your friend will get kicked out of school. If you don't confess and your friend confesses, your friend will get an F for the test only and you will get kicked out of school. You don't know what your friend will do, and you have no way to find out until after your friend meets with the professor. What do you do?

Figure 1. Cooperation by Length of Dating Relationship

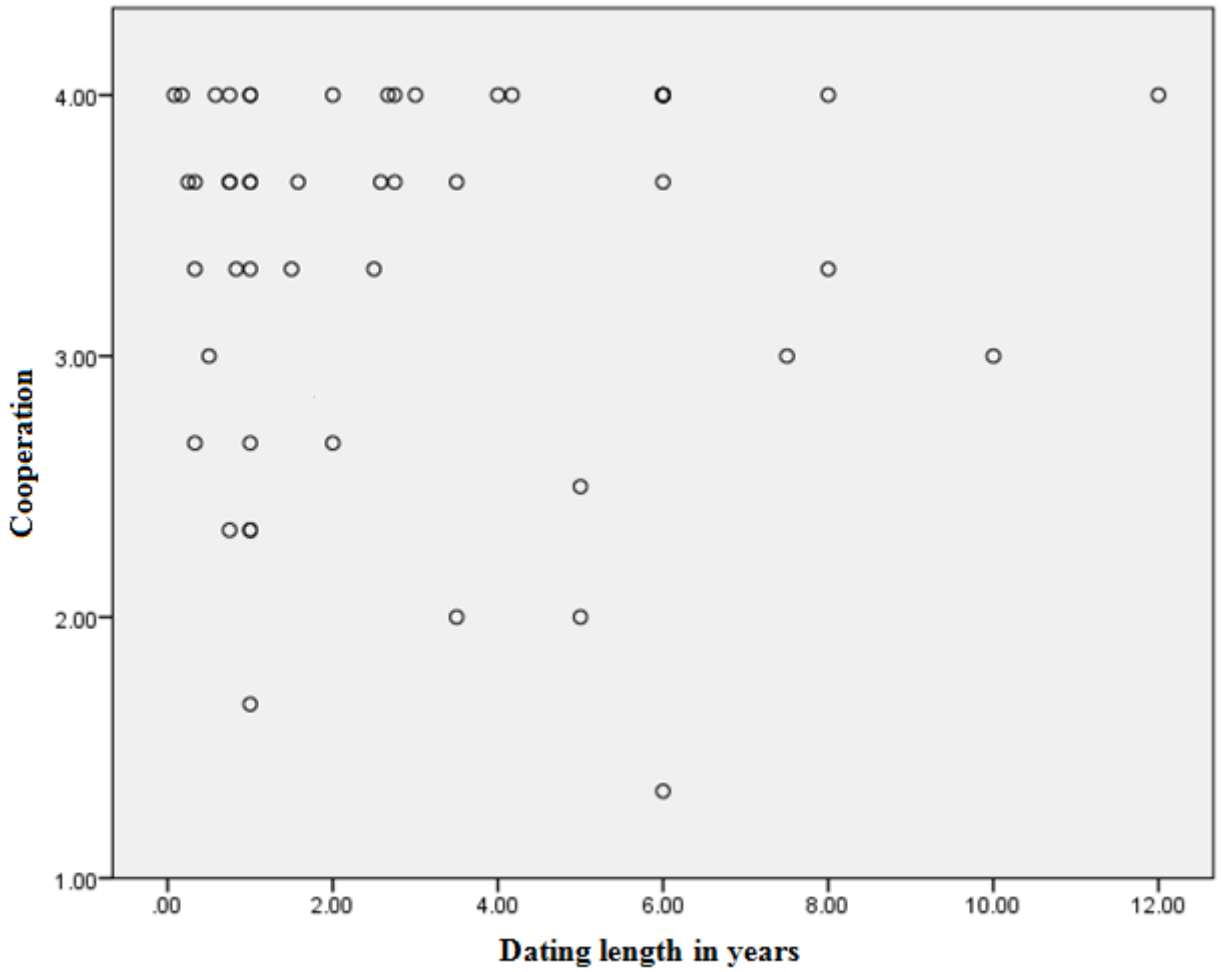

Figure 1. Correlational model of cooperation and dating length in years.

The Influence of Fantasy Orientation on Children's Social Development

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Abstract: *Fantasy orientation is a term describing children who engage in imaginative play/thoughts and/or have imaginary companion(s). Imaginative play and thoughts are often assessed through Singer and Singer's Imaginative Play and Predisposition Interview (IPP; 1990) as well as Taylor and Carlson's Imaginary Companion interview (IC; 1997). Previous research suggests there are developmental benefits (i.e., better inhibitory control and working memory) for being fantasy oriented (Pierucci, et al., 2014); however, there is debate about how fantasy orientation contributes to children's social development. Therefore, this study explored if being fantasy oriented influenced children's social skills as measured by theory of mind (Band-Aid task) and the Social Responsiveness Scale (SRS). Children (n = 185; range: 3-8 years old) completed two fantasy orientation interviews (IC and IPP) and a theory of mind task (Band-Aid task). Additionally, teachers completed the SRS to assess children's social skills via four subscales (i.e. awareness, cognition, communication, and motivation). Results revealed no significant relationship with fantasy orientation (i.e. imaginary companion(s) status and imaginative play/thoughts) with social skills (i.e., theory of mind and SRS). However, there were slight mean differences with theory of mind skills (i.e., Band-Aid task) and social awareness skills (i.e., SRS), favoring children with imaginary companion(s). Although it was hypothesized that high fantasy oriented children would display better social skills (i.e., theory of mind and SRS), there were no significant differences. These findings suggest that having imaginary companion(s) and or engaging in fantasy play/thoughts are not a benefit or hindrance to children's social development.*

Keywords: fantasy orientation, imaginary companions, imaginative play, social skills

The Influence of Fantasy Orientation on Children's Social Development

Imagine you are a 4-year-old child again. The world is full of wonder because you have the power to transform any ordinary space into an extraordinary one. Let's take your bedroom for example; did you ever pretend your room was an enchanted forest? Could you imagine defeating a fire-breathing dragon or getting ready for the royal ball? Perhaps you even shared these adventures with an imaginary companion. These scenarios are often characteristic of individuals that are fantasy oriented, specifically exhibiting high fantasy orientation. If you can remember playing in the scenarios like the ones above, it is likely you were a fantasy oriented child. The purpose of the current study was to explore children's social development and how it related to their fantasy orientation. In particular, this study examined the effects of young children's imaginative play/thoughts

and imaginary companion(s), as it related to development of their theory of mind and social skills. Below highlights each of these variables of interest.

What is fantasy orientation?

In the field of developmental psychology, fantasy orientation (FO) is a term used for children who have a tendency to engage in fantastical play/thoughts and create imaginary companion(s). High fantasy oriented children often use their imaginations to create adventures, in addition to creating imaginary companions that join them in explorations of their worlds. However, some children do not create imaginary companions and primarily engage in realistic driven play that is not centered on imaginary entities or scenarios thereby displaying low or no fantasy orientation (Pierucci, O'Brien, McInnis, Gilpin, & Barber, 2014; Majors, 2013).

Past research has shown that children age 3-4 years old with imaginary companions comprise approximately one-third of the population (Taylor, & Carlson, 1997; Pierucci et al., 2014) and are more prevalent in first-born children and only children (Majors, 2013). Additionally, researchers have shown that 67% of children reported having imaginary companions sometime in their childhood up through the age of 7 (Taylor, Carlson, Maring, Gerow, & Charley, 2004). Within this time frame, imaginary companions typically disappear around 6 or 7 years of age but have the potential to remain present throughout adolescence (Taylor & Carlson, 2004).

In the past, imaginary companions and pretend play were indicators of clinical concern linked to "psychopathology, personality defects, and deficiencies in social skills" (Trionfi & Reese, 2009). However, it is important to note that these studies' data were a reflection of at-risk clinical populations and did not reflect populations with typical development. Presently, research in fantasy orientation demonstrates that being fantasy oriented, such as having an imaginary companion, may offer cognitive and social skill benefits. As conveyed in previous studies, fantasy orientation has been linked to better sociability in children and improved executive functions (Trionfi & Reese, 2009; Gleason, 2002; Pierucci et al., 2014; Majors, 2013).

What is an imaginary companion?

Psychologists debate the difference between personified objects and imaginary companions. Personified objects are physical items, like a teddy bear that children interact with in a similar way to invisible companions. However, the main difference between an invisible companion and a personified object is the relationship the children have with these entities. Children were more likely to have a dominant relationship with their personified objects where the child took on the parental role (Gleason, 1997) whereas with an invisible companion, children were more likely to perceive the invisible entity as an equal. Gleason also found that other people were aware of personified objects, whereas invisible companions were kept private (1997). Therefore, the distinction of invisible companions and personified objects is important because it can demonstrate what a child is seeking in their relationships – whether control (i.e., parental role) or companionship (i.e., equal roles). In addition, imaginary companions can serve various purposes in children's lives. Often, the purpose of imaginary companions is to alleviate loneliness and boredom, in conjunction with providing support and companionship during difficult times (Majors, 2013).

For the purpose of this study, imaginary companions consisted of both personified objects and invisible companions. This composition of imaginary

companions is supported by previous research that suggests that they are played with for periods of time over several months, have a name, and seem realistic to children (Taylor, Cartwright, & Carlson, 1993). However, this definition is limiting because a child may have multiple imaginary companions that come and go.

What are the social implications of fantasy orientation?

Research has since deviated from the perspective that imaginary play was a sign of mental illness and a hindrance to social skills. Fantasy orientation (FO) has been shown to enhance social skills (Gleason, 2002; Davis, Meins, & Fernyhough, 2013). For instance, there is a collective trend showing that children with imaginary companions make friends with ease (Trionfi, & Reese, 2009; Gleason, 2002; Majors, 2013).

Researchers also discovered that fantasy orientation could assist children in differentiating relationships with others. The importance of differentiating relationships is, for example, that children identify they should treat their parents differently than they treat their siblings. For children with imaginary companions, their differentiations of relationships implies that they can respond to people more appropriately in a social context in comparison to their peers without imaginary companions (Gleason, 2002).

Perspective-taking skills. Theory of mind has been considered a social skill given its pertinence of an individual recognizing that others have their own minds and thoughts disparate from one's personal thoughts (Premack & Woodruff, 1978; Wellman, Cross, & Watson, 2001). It is important to study theory of mind in the context of children's social skills. In other words, if children have developed theory of mind, it mirrors their social abilities to acknowledge the perspective of others and problem solve (Greenberg, Bellana, & Bialystok, 2013).

One method to examine theory of mind development is through false belief tasks. False belief tasks involve scenarios in which the participant is told information that only the participant and experimenter know. The experimenter then asks the participant what an outsider would think. If the participant responds by acknowledging that an outsider has a belief that is different from what the participant knows is true, then the participant is thought to have developed theory of mind (Wimmer & Perner, 1983). A specific false belief task is the Band-Aid task. During this task, a child is presented with a Band-Aid box. The child is then asked what s/he thinks is in the box. Once s/he replies, the participant is asked to open the box. In the box the child finds stickers; then the experimenter asks: "if you give the box to your teacher, what do you think your teacher will say is in the box?" If the child says stickers, s/he does not yet master the task thereby display no theory of mind. If the child says Band-Aids, then s/he realizes that another person does not know what the child knows; hence, s/he realizes the teacher has his or her own mind (Gopnik & Astington, 1988; Wellman, Cross & Watson, 2001).

With this understanding, there is debate whether or not pretend play has an impact on theory of mind. Some researchers believe that children view pretending merely as an action, not fully comprehending the mental capacity of another person (Permer et al, 1994; as cited in Taylor & Carlson, 1997). In conjunction with this perspective, these experts suggest children that engage in pretend play may be too easily credited with having an earlier emergence of theory of mind when that may not be the case. In contrast, some researchers believe that fantasy oriented children do have a greater understanding of this concept because they

can grasp pretend from reality (Taylor & Carlson, 1997). While theory of mind has been considered as a cognitive skill given its potential neural precursors, this study examined theory of mind as a social skill given it necessitates taking the perspective of another person.

Social responsiveness skills. One instrument used to measure social skills is the *Social Responsiveness Scale* (SRS; Constantino & Gruber, 2005). The SRS is a 65-item test given to a caregiver or teacher and s/he ranks the participant from 1 (not true) to 4 (almost always true) for each question. The SRS is comprised of five subscales: social awareness, social cognition, social communication, social motivation and autistic mannerisms. For this study, the first four subscales were completed by teachers and used for the subsequent analyses.

Purpose of the current study

The purpose of this study was to investigate the relationship of children's fantasy orientation and social development. In particular to assess social skills, the study employed the Band-Aid task to measure participants' theory of mind/perspective taking and the *Social Responsiveness Scale* to examine participants' awareness, motivation, communication, and cognition. To assess fantasy orientation, Taylor and Carlson's Imaginary Companion interview (IC) was used to determine if the participant had imaginary companion(s) while Singer and Singer's Imaginative Play and Predisposition interview (IPP) was administered to assess the participants' thoughts and play.

Hypotheses

H1: There would be a significant correlation between Singer and Singer's IPP and Taylor and Carlson's IC. In other words, children with more imaginative play and thoughts would be positively correlated with having imaginary companion(s).

H2: Fantasy orientation measured by imaginary companion status (IC) would significantly relate with children's social skills (i.e., theory of mind and SRS). Therefore, children having imaginary companion(s) would have developed theory of mind and display better social skills as compared to children without imaginary companion(s).

H3: Fantasy orientation measured by imaginative play and thoughts (IPP) would significantly relate with children's social skills (i.e., theory of mind and SRS). That is, children with high imaginative play and thoughts would have developed theory of mind and display better social skills as compared to children with low/no imaginative play and thoughts.

Method

This study consisted of 213 recruited participants; however, 28 participants were removed from the sample due to incomplete assessments. Thus, the sample included in the analyses was 185 participants. The age of the participants ranged from 2 years and 9 months to 8 years and 9 months, with an average age of 5 years and 4 months (M = 65.79 months, SD = 17.35 months). Females represented 51.6% of the sample and 47.8% were male. The demographics of the participants were as follows: 71.5% Caucasian, 23.1% African American, .5% Hispanic, 2.2% Asian, and 1.1% who were not specified. Participants were recruited from local pre-schools in the Southeast region of the United States, and these archival data were obtained from two previous child development studies conducted in the KID lab at the University of Alabama.

Experimental stimuli

The children's battery of measures included two fantasy orientation interviews and a theory of mind task. More specifically to measure fantasy orientation, Singer and

Singer's (IPP) Imaginative Play Predisposition interview (1981) and Taylor and Carlson's (IC) Imaginary Companion and Impersonation interview (1997) were administered while the Band-Aid task (Gopnik & Astington, 1988) was conducted to assess theory of mind development. Teachers completed the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005), which measured four areas of children's social skills.

Procedure

Fantasy orientation measures. The Imaginary Companion interview (IC; Taylor & Carlson, 1997) determined whether the participants did or did not have imaginary companion(s). This interview consists of 10 questions; the first question probed if the participant had an imaginary companion. If the participant said no, then the interviewer moved on to the next part of the interview. If the participant responded yes, then the interviewer asked nine further questions that helped describe the child's imaginary companion. The nine questions about their imaginary companion(s) were: 1) the name of X, 2) is X toy or pretend, 3) gender of X, 4) age of X, 5) the appearance, 6) what they like about X, 7) what they do not like about X, 8) where does X live, and 9) does X sleep. Participants were given a score of 1 if they did have an imaginary companion, as also supported by the subsequent questions, and a score of 0 if they did not have an imaginary companion.

The Imaginative Play Predisposition interview (IPP; Singer & Singer, 1981) was administered to participants to determine if they engaged in pretend play. For example, children were asked, "Do you ever pretend to be an animal?" and "What is your favorite toy". These questions were scored from 0 (indicative of realistic play) to 2 (indicative of high fantasy oriented play). A score of 0 was given if the participant's favorite game were rule-based like, Monopoly or chess, whereas a score of 2 was given if a participant reported playing as a super hero or a princess.

Theory of mind measure. The Band-Aid task was given to measure theory of mind development. In this task the participant was shown a Band-Aid box. As a control question, the experimenter asked the child what s/he thought was in the box. The experimenter opened the box and revealed that there were objects different than Band-Aids (stickers). First, the experimenter asked the participant what s/he originally thought was in the box and recorded his/her response. Then the experimenter asked the participant if s/he was to show someone else (teacher) the Band-Aid box, what would the teacher think was in the box? If the participant responded that the teacher would think there were Band-Aids in the box then the child was classified as having theory of mind because they could acknowledge that the other person had a false belief and did not know what the participant knew. If the participant thought that the teacher knew there were stickers in the Band-Aid box, then they did not possess theory of mind. Participants were given a score of one for responding Band-Aids (correct, had developed theory of mind) and zero for responding stickers (incorrect, had not developed theory of mind).

Social responsiveness measure. The Social Responsiveness Scale (SRS; Constantino & Gruber, 2005) was completed by the teachers of the participants and consisted of 53-questions pertaining to the following subscales: social awareness, social cognition, social communication, social awareness (i.e., excluding the autistic mannerisms subscale). The teachers rated each question from 1 (not true) to 4 (almost always true), with items reverse scored when necessary. Thus, lower scores on the SRS reflected better social skills in children.

Results

In order to determine if fantasy orientation demonstrated social benefits for young children, the relationship of fantasy orientation and performance on a theory of mind task (i.e., Band-Aid task) and a social responsiveness assessment (i.e., SRS completed by teachers) was investigated.

Preliminary analyses

Below are the descriptive results for children's fantasy orientation and theory of mind as reported by children along with social skills as reported by teachers.

Imaginary companions. Of the 185 participants, 61 participants reported having imaginary companions, which comprised 32.8% of the sample. This result is consistent with Taylor and Carlson's (1997) finding that approximately 28% of participants reported having imaginary companion(s). Within this sample, 41 females and 20 males reported having imaginary companions. Refer to Table 1 for the frequencies of imaginary companions for each age group.

Imaginative play and thoughts. Singer and Singer's IPP interview consisted of eight separate items – including the total score. From this measure, 69.9% of the children (*M* = .71, *SD* = .46*)* reported pretending to be an animal, 59.1% (*M* = .60, *SD* = .49) reported pretending to be another person, and 49.5% (*M* = .50, *SD* = .50) reported pretending to be another entity (e.g., airplane). Children who reported playing games that were fantasy oriented comprised 46.8% of the sample (*M* = .61, *SD* = .71*).* Additionally, 53.2% (*M* = *.55, SD* = .51) reported talking to themselves, and 55.9% (*M*=. *81, SD*=.77) reported thinking fantastical thoughts before bedtime. Total scores on the IPP ranged from 1 to 10; therefore a median-split based on cumulative percentage was conducted for reported *t*-tests below. Specifically, 45% of the sample had scores from 1 to 4 which represented "low FO", and 55% of the sample had scores from 5 to 10 which represented "high FO". This median-split method was based on previous research (Pierucci et al., 2014).

Theory of mind. As measured by the Band-Aid task, 66.7% of the sample demonstrated having developed theory of mind, which equated to 124 children out of 185. See Table 2 for the age distribution of participants displaying developed theory of mind.

Social responsiveness skills. As measured by the Social Responsiveness Scale (SRS), there were 4 subscales rated by the teachers. Lower scores on the SRS reflected better social skills in children. The overall score across the 4 subscales on the SRS, as listed below, had a minimum score of 4.25 and maximum score of 11.42 with a potential maximum score of 157 (*M* = 6.13, *SD* = 1.34). Specifically, scores from the social awareness subscale ranged from 1 to 3.25 with a potential maximum score of 16 (*M* = 1.83, *SD* = .34), and scores from the social cognition subscale ranged from 1 to 2.75 with a potential maximum score of 36 (*M* = 1.53, *SD* = .38). Additionally, scores from the social communication subscale ranged from 1 to 3.14 with a potential maximum score of 70 (*M* = 1.49, *SD* =.41), and the social motivation subscale scores ranged from 1 to 3.45 with a potential maximum score of 35 (*M* = 1.42, *SD* = .45).

Primary analyses

Below are the correlational and *t*-test results of analyses exploring the three hypotheses of the current study.

H_1: Correlations across fantasy orientation measures. To explore the relationship of children's imaginary

companion status (IC) with their imaginative play and thoughts (IPP), bivariate correlations were conducted. Specifically, IC and IPP (pretending to be an animal) were correlated, r =.229, p = .002. Additionally IC and IPP (pretending to be a person) were correlated, r =.15, p = .043, which these findings were expected and corroborated previous research (Taylor & Carlson, 1997; Pierucci et al., 2014).

H_2: Imaginary companion status with social skills. To determine the relationship of imaginary companion(s) status(es) with theory of mind skills in children, a Pearson's correlation was conducted. Specifically, the correlation compared Taylor and Carlson's IC interview with Gopnik and Astington's Band-Aid task. Results demonstrated no significant correlation, r = .30, p = .686.

Furthermore, to discover the relationship of imaginary companion status (IC) with children's social skills as measured by the Constantino and Gruber's SRS, independent-sample *t*-tests for each subscale on the SRS was explored. For the social awareness subscale, results showed no significant difference between imaginary companion status and children's social awareness skills, $t(170) = .448$, $p = .665$. The results for the social cognition subscale revealed no significant relationship between imaginary companion status with social cognition skills, $t(167) = -.049$, $p = .961$. Additionally, the social communication subscale results presented an insignificant difference between imaginary companion status and social communication abilities, $t(166) = -.801$, $p = .424$. Lastly, results for the social motivation subscale demonstrated no significant relationship between imaginary companion status and social motivation, $t(155) = -.340$, $p = .734$. That is, children with and without imaginary companions did not differ in social skills according to the SRS. Refer to Table 3 for means and standard deviations.

H_3: Imaginative play and thoughts with social skills. To explore the relationship of children's imaginative play and thoughts with theory of mind skills, a Pearson's correlation was employed. The result was not significant, r = -.047, p = .544. To further investigate children's social skill development (SRS) with their imaginative play and thoughts (IPP), independent-samples *t*-tests were performed. Social skills, as measured by SRS subscales, were compared across high- vs. low-fantasy oriented children, which was identified by the IPP median-split. See preliminary analyses for IPP median-spit method. The social awareness subscale was not significantly related to children's play and thoughts, $t(155) = -.348$, $p = .729$. In other words, there were no differences in social skills of children with high- vs. low- fantasy oriented play and thoughts. Results for the social cognition subscale also showed no significant relationship between high- vs. low- fantasy oriented play and thoughts with social cognition abilities, $t(152) = -1.611$, $p = .109$. In addition, the social communication subscale was not significantly related to play and thoughts with children's social communication skills, $t(151) = -1.263$, $p = .209$. Finally, results for the social motivation subscale revealed no significant difference between children with high- vs. low- fantasy oriented play and thoughts, $t(140) = -.999$, $p = .320$. Refer to Table 4 for means and standard deviations.

Discussion

The focus of this study was to investigate if children with imaginary companions and/or exhibiting imaginative play and thoughts had better social skills (as measured by Band-Aid task and SRS) compared to children without imaginary

companions and/or engaging in more realistic play and thoughts. Results revealed that imaginary companion status (IC) and imaginative play and thoughts (IPP) were not indicative of enhanced social skills. However, there were slight mean differences between children with and without imaginary companions on the Band-Aid task and the SRS subscale of social awareness, which both favored children with imaginary companions. Overall, this study showed that fantasy oriented children developed social skills at a comparable degree to realistic oriented children, and children with imaginary companions are marginally (but not significantly) more social than children without imaginary companions via measurement of theory of mind and social awareness.

The first hypothesis predicted that Taylor and Carlson's Imaginary Companion interview (IC; 1997) would correlate with Singer and Singer's Imaginative Play and Predisposition task (IPP; 1981). Hypothesis one was formulated based on former research that concluded imaginary companion status (IC) correlates with imaginary play and thoughts (IPP). As hypothesized, there was a significant correlation between IC status and IPP, specifically on two subscales (i.e., pretending to be an animal and pretending to be another person). In other words, children who had imaginary companions were more likely to report pretending to be an animal and a person compared to children without imaginary companions. Hypothesis one demonstrated that imaginary companion status is linked to imaginative play and thoughts, which is essential to the reliability of fantasy orientation measures (i.e., IC and IPP) and is corroborated with past research (Taylor & Carlson, 1997; Pierucci et al., 2014).

The second hypothesis examined the relationship of imaginary companion status (IC) with children's social skills as measured by the Band-Aid task and SRS. Hypothesis two inferred that children with imaginary companions would have better developed theory of mind and social skills in comparison to children without imaginary companions. The results concluded that the relationship between children having, or not having, imaginary companion(s) in comparison with their performance on the Band-Aid task and SRS were insignificant. Therefore, the difference between children with imaginary companions and without imaginary companions showed no significant difference with developing theory of mind and social skills. With sensitive interpretation, one can conclude from these data that children's imaginary companion status did not influence children's performance on the Band-Aid task or teachers' reports of social skills on the SRS.

Although results were not significant, the mean for performance on the Band-Aid task was slightly higher for children with imaginary companions than the mean for children without imaginary companions. These results could infer that it is marginally more probable for children with imaginary companions to develop theory of mind in comparison to children without imaginary companions. See Table 3 for group means. Results were similar for the subscale of social awareness on the SRS. That is, the mean difference according to children's imaginary companion status occurred under the social awareness subscale. Again, the mean for social awareness was lower (i.e., better) for children that reported having imaginary companion(s). Thus, with sensitive interpretation, these data indicate that children with imaginary companion(s) exhibit marginally better social awareness than children that do not report having

imaginary companion(s). See Table 3 for group means.

These mean differences could be attributed to previous imaginary companion research. Gleason (1997) found that children usually kept the knowledge of their imaginary companions to themselves, which could be impart to children's awareness and theory of mind – being cognizant of which social situations they interact with their imaginary companion(s). Therefore, because of children's concern about how they could be perceived if people knew about their imaginary companions, this might explain why children with imaginary companions have a minuscule better understanding of theory of mind and social awareness (based on sensitive interpretation of the mean differences).

Hypothesis three investigated if there was a significant relationship between Singer and Singer's IPP and children's social skills as measured by the Band-Aid task and SRS. The third hypothesis predicted that children with high scores on the IPP (scores ranging from 5-10) would perform better on the Band-Aid task and the SRS than children with low scores on the IPP (scores ranging from 1-4). The results for the IPP and the Band-Aid task were insignificant. Additionally, results for the IPP and the SRS subscales were all found to share no significant relationship. Consequently, hypothesis three was not supported, and children with imaginative play and thoughts (IPP) had closely related scores to children without imaginative play and thoughts (i.e., realistic driven thoughts and play). Furthermore, there was no substantial difference in children's performance on the Band-Aid task and the SRS between children with realistic play and thoughts compared to children with imaginative play and thoughts.

One of the strengths of this study was the large sample size (n = 185) and comprehensive age range (3-8 years old), especially because former studies with similar aims either focused on younger children from age 3-4 years old (Pierucci et al., 2014) or school aged children (Taylor & Carlson, 2004). Therefore, this study was unique by including both a younger age group of children freshly learning to distinguish fantasy from reality and school aged children that frequently alternate between fantastical thoughts and reality (Pierucci et al., 2014; Trionfi, & Reese, 2009). Another forte of the study was the use of the measures such as the IC and IPP, which have been used in previous research and have been shown to correlate with one another (Singer & Singer, 1990; Taylor & Carlson; 1997). The concrete scoring of the Band-Aid task (i.e., developed theory of mind or non-developed theory of mind) was also an asset, given it was dichotomous, allowing one to appropriately categorize children's theory of mind development.

A limitation of this study was the use of the SRS because although it measures a battery of social skills through "subscales", the teachers that completed the SRS might not have full knowledge of the children's fantasy inclinations. Perhaps the teachers have not been exposed to the child's fantasy play or have not known the child for a substantial amount of time to accurately report on the children's skills. It may have been more advantageous to use another scale to measure social skills that is self-reported by the children. However, the SRS measurement was selected in order to diversify the collected data through having multiple informants (i.e., children and teachers), rather than solely relying on self-reports from the children. In contrast, teachers completing the SRS can also serve as a limitation because it might not be a true testament of the children's social abilities.

Another limitation is that only two measurements were used to examine fantasy

orientation and two measurements were used to assess social skills. Although the fantasy orientation scales asked comprehensive questions to assess if children had imaginary companions, perhaps it would be more optimal to observe children playing in their natural environment to better examine if children engage in fantasy play. Though the Band-Aid task is reflective of a child's basic understanding of theory of mind, it would have been interesting to use a different scale (e.g., ACES – measurement that provides social vignettes for children to interpret how others feel as described in the vignettes) to measure the degree of the child's understanding of theory of mind (Schultz, Izard, & Bear, 2004).

The essential implication of this study was that fantasy orientation in children was shown to be neither an advantage or disadvantage to children's social development in the following categories: theory of mind, social awareness, social cognition, social communication, and social motivation (as measured by the Band-Aid task and the SRS). Due to the diversity of research findings that demonstrate children's fantasy orientation as either an enhancement or hindrance to social development, the results of this study are unique because they did not show evidence for either perspective. However, this study revealed consistent results that children who engage in fantasy oriented play comprise approximately one third of children suggesting this research impacts a significant amount of the population and their families. Though the results were not statistically significant, this research displayed that fantasy oriented children were just as capable of developing competent social skills as children that were not fantasy oriented. Furthermore, regardless of how a child prefers to play, whether fantastical or realistic, parents and teachers can accept both forms of play as an appropriate aspect of development.

Suggestions for future research are to discover more methods of assessing fantasy orientation whether it is via self-reported interviews, parent or teacher interviews, or observing children in their natural play environments. Researchers can test the efficacy of the preexisting measures used to analyze children's fantasy orientation, theory of mind, as well as other social skills. In addition, researchers could also conduct longitudinal studies on how fantasy orientation as a child influences learning styles and future career selection. It would be fascinating to discover teaching methods or styles that can assist fantasy oriented children to thrive in the classroom and interact with their worlds. Further investigations could examine if high fantasy orientation as children has an influence on future career selection as adults. One study found that creative writers often engaged in fantasy play as children (Taylor, Hodges, & Kohanyi, 2003); therefore, fantasy orientation could also be linked to other creative careers. Lastly, as previously speculated, it would be exciting to determine if fantasy orientation could help improve social and cognitive developments during old age and possibly prevent the onset of memory disorders such as dementia or Alzheimer's (Pierucci et al., 2014; Bialystok & Craik, 2010; Stern, 2002).

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Table 1

Frequency and Percentage of Imaginary Companions According to Age in Years

Age In Years	Frequency	Percentage
3	3	4.9
4	18	29.5
5	23	37.7
6	9	14.8
7	3	4.9
8	5	8.2
Total	61	

Note. n = 185 participants. Thus, 61 children reported having imaginary companion(s).

Table 2

Frequency and Percentage of Children with Theory of Mind According to Age in Years

Age In Years	Frequency	Percentage
3	4	3.2
4	35	28.2
5	42	33.9
6	15	12.1
7	14	11.3
8	14	11.3
Total	124	

Note. n = 185 participants. Thus, 124 children displayed developed theory of mind.

Table 3

Means and (Standard Deviations) of Children's Social Skills and Imaginary Companion Status

	Imaginary Companion Status	
Social Skills Measures	With (IC)	Without
Theory of Mind	.69 (.47)	.66 (.48)
SRS Awareness	1.86 (.43)	1.89 (.40)
SRS Cognition	1.60 (.44)	1.59 (.40)
SRS Communication	1.59 (.48)	1.53 (.40)
SRS Motivation	1.52 (.54)	1.49 (.47)

Table 4

Means and (Standard Deviations) of Children's Social Skills and Imaginative Play and Thoughts

	Imaginative Play and Thoughts	
Social Skills Measures	High IPP	Low IPP
Theory of Mind	.67 (.47)	.71 (.46)
SRS Awareness	1.89 (.43)	1.87 (.40)
SRS Cognitive	1.66 (.45)	1.55 (.40)
SRS Communication	1.60 (.46)	1.51 (.41)
SRS Motivation	1.57 (.52)	1.48 (.49)

CoBRAS as a Predictor of Policy Attitudes

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Abstract: *The Color-blind Racism Attitudes Scale (CoBRAS; Neville, Lilly, Duran, Lee, & Browne, 2000) was designed to measure the extent to which people adhere to the dominant racial ideology of color-blindness. A growing body of research supports its effectiveness as a measure of this construct (Neville, Coleman, Falconer, & Holmes, 2005; Neville, Worthington, & Spanierman, 2001), but relatively little attention is being paid to whether scores from the CoBRAS are predictive of race-related policy attitudes, and if so, whether they account for a substantial amount of the variance in policy attitudes above and beyond what can be explained by other measures. This present study aimed to fill this void by investigating the extent to which CoBRAS scores were predictive of attitudes toward one particular race-related policy domain: resource redistribution as a means of ameliorating the Black-White achievement gap. It also examines its relevance after controlling for social dominance (Sidanius & Pratto, 2012) and attributions for the gap itself. A total of 166 participants completed the CoBRAS, Social Dominance Orientation (Pratto, Sidanius, Stallworth, & Malle, 1994), the Attributions for Scholastic Outcomes—Black scale (Sperling & Vaughan, 2009), and the Attitudes toward Scholastic Reform scale. Results indicated that CoBRAS scores were predictive of school policy attitudes over and above all of the covariates. In total, the model explained 27.1 proportion of the variance. Implications for the measurement of color-blindness as a latent trait as well as the utility of scores in predicting attitudes in other domains are discussed.*

CoBRAS as a Predictor of Policy Attitudes

The nature of prejudice has not changed since Gordon Allport (1954) penned his landmark treatise on race relations 60 years ago, and based on the numbers, it would be easy to assume that people are less affected by misguided beliefs about Blacks and Latinos now than they were in the 1950s (Bonilla-Silva, 1997). The reality is that while the nature of prejudice has not changed, the expression of it has. Whereas people used to be transparent about their dislike of stigmatized minorities, today they are much more reticent about owning up to it (Bonilla-Silva, 2003).

Of the various theories that have been proposed to describe this new, subtler way of expressing racial prejudice, racial ideology theory (Bonilla-Silva, 2003) has emerged as one of the most promising. It alleges that people are motivated to manifest their dislike of Blacks and Latinos in socially acceptable ways. In the current era, the most common way is by professing "color-blindness" while simultaneously avowing the cultural superiority of Whites. Virtually no social sanctions accrue to people who subscribe to these "common sense" beliefs, so people are free to express

their dislike of Blacks and Latinos as long as they cite cultural rather than genetic reasons for doing so. Color-blindness has become so prominent in fact that it is now considered to be the central dogma of racial prejudice (Bonilla-Silva, 2001, 2003; Neville, Lilly, Duran, Lee, & Browne, 2000).

Quantifying adherence to this new racial ideology has been somewhat complicated because the original theory made clear that racism is best thought of as a sociological phenomenon and that measuring individual differences in racial prejudice distracted researchers from thinking about race relations at the structural level. According to Bonilla-Silva (1997), myopic views of racial prejudice serve only to hide the institutionalized forms of favoritism while the "bad people" are identified and remediated. The root of the problem lies within the social structure itself, not within individuals. Researchers who include these phenomena in their studies are encouraged to avoid inadvertently reinforcing the wrong ideas through their work.

Neville, Lilly, Duran, Lee, and Browne (2000) negotiated this difficult terrain by developing the Color-Blind Racism Attitude Scale (CoBRAS) in an effort to enumerate individual differences on this trait. A developing body of research has shown that the CoBRAS is effective in measuring adherence to several of the key components of racial ideology theory (Neville, Awad, Brooks, Flores, & Bluemel, J., 2013; Neville, Spanierman, & Doan, 2006). Unfortunately, with few exceptions (e.g., Awad, Cokley, & Ravitch, 2005) little attention has been paid to whether it can be used to predict policy attitudes. This would be an important advancement because if the CoBRAS is shown to be psychometrically sound, it could provide new information as to why people are so reluctant to embrace redistributive social policies aimed at rectifying many different forms of social stratification that exist in society today.

In this regard, one variant of social stratification that has been particularly robust to change is the way schools structure race-based academic achievement gaps. According to National Center for Educational Statistics (2013) Blacks and Latinos do not achieve equally with Whites all the way from kindergarten through high school. In fact, the gap tends to widen as students make their way through the schooling system.

Many strategies have been implemented to close the gap, and most have received at least lukewarm support from the general public (Rose & Gallup, 2006). Redistributing money and other resources directly to predominately Black schools is the anomaly as mere mention of such a policy is almost always met with consternation. Ostensibly, the same public that actively professes to have a race neutral mentality refuses to endorse policies that are recognized as necessary for ending the relationship between race and educational outcomes (Sperling & Vaughan, 2009).

This "principle-implementation gap" (Schuman, Steeh, Bobo, & Krysan, 1997) that characterizes the somewhat dissociative identity of the public's view of academic achievement gaps is fully resolvable within the framework of racial ideology and the notion that people are able to express prejudice through the mechanism of color-blindness. In this study, we examine whether a popular measure of color-blindness, the CoBRAS, is effective in predicting people's attitudes towards school reform policies aimed at shifting money toward predominately Black schools in an effort to close the Black-White achievement gap. The results add to the literature on the predictive validity of the CoBRAS while also providing insight into how racial prejudice disguised by color-blindness affects people's

commitment to racial equality in education.

CoBRAS & Color-blind Racial Attitudes

Color-blindness refers to the belief that race should not and does not matter (Neville, Lilly, Duran, Lee, & Browne, 2000). According to Bonilla-Silva (2003), it consists of three parts: (1) the denial of White privilege; (2) the denial of institutional racism; and (3) the denial of discrimination (Bonilla-Silva, 2003). People who harbor color-blindness hold on to the rather magical belief that if we recite the mantra "all people are created equal" enough times, somehow it means that all people are already being treated equally. It further follows that if all people are in fact being treated equally, there is no reason to support race-conscious social policies because they are unnecessary and because they only work to reinstitute a "race obsessed" philosophy. The CoBRAS was designed to measure the extent to which these belief patterns are endorsed at the individual level.

Results of the initial construction and validation of the CoBRAS showed that it was positively related to other indexes of racial attitudes, such as unawareness of racial privilege, institutional discrimination, and blatant racial issues, as well as two measures of belief in a just world (Neville, Lilly, Duran, Lee, & Browne, 2000). These results indicate that color-blindness is related to greater levels of racial prejudice and a belief that society treats all people fairly. Therefore, it is reasonable to expect that people who rely on these sorts of conceptualizations of racial stratification would oppose race-conscious social policies, particularly those that reward groups of people that they feel are culturally inferior.

Color-blindness and "the Gap"

The history of American education is marred with achievement gaps that separate the races, and while many people are aware that these gaps exist, they fail to support viable solutions (Gushue & Constantine, 2007). Instead, they rationalize their opposition to ambitious egalitarian policies by claiming that racial/ethnic minorities are to blame and that schools already offer an unmitigated path to social mobility for anyone willing to work hard enough to pursue a diploma.

The assumption that schools are the great equalizers reflects a "just world" (Lerner, 1980) mentality that is in complete agreement with the color-blind perspective (Neville, Lilly, Duran, Lee, & Browne, 2000). Although prejudice, discrimination, and social inequality still exist in our society, believing that that the world is a just and fair place helps people deal with uncertainty feel a sense of control over their fate (Ramos, Correia, & Alves, 2014) while also expressing antipathy toward racial/ethnic minorities. Educational stratification is seen as just one of an array of natural processes that sort people according to the deservingness of their social groups (Pratto, 1999). In their eyes, the failure of racial/ethnic minorities reflects the natural consequence of profound differences in cultural norms, all of which favor Whites (Ryan, 1976).

The color-blind perspective is not only about individuals expressing antipathy; it also has functional value at the sociological level (Bonilla-Silva, 1997). Research indicates that schools with a strong minority population produce students who have lower test scores and a higher likelihood of dropping out (Vanneman, Hamilton, Anderson, & Rahman, 2009). And, although research also suggests that these differences are mainly due to inadequate funding, unmotivated and incompetent teachers, and a lack of support for minority students (Pearl, 2002), these explanations are summarily dismissed as "whining." This is not happenstance. To the extent that people ambitiously search for

ways to rationalize "victim-blaming" mentality (Ryan, 1976), they are not paying attention to the myriad ways schools structure differential outcomes into the educational process (Murrell, Dietz-Uhler, Dovidio, Gaertner, & Drout, 1994; Neville, Worthington, & Spanierman, 2001). This allows the groups who profit most from social stratification to carry on unfettered because only a precious few are demanding recreation of a more just and verdant school system, and those people can be vilified as socialist or just simply "crazy" (Bowles & Gintis, 1976).

Color-blindness is therefore conceptually linked to attitudes toward policies aimed at taking resources from White students and giving them to Black students. For those affected most by it, such policies would be guilty of acknowledging the importance of race in thinking about how schools operate, and would be akin to giving something extra to the very students who are the least deserving. That being said, it is still critical to differentiate the contribution that color-blindness makes to the prediction of policy attitudes over and above what can be accounted for by other explanatory variables, such as social dominance orientation and causal attributions for the Black-White achievement gap, if it is going to be regarded as a critical element within the dialogue surrounding this issue.

Social Dominance Orientation

Social dominance theory seeks to explain group-based prejudice and oppression through the lens of group conflict and group-based inequality. As Sidanius and Pratto (1993; 1999) explain, societies minimize group conflict by maintaining the status quo and reproducing social hierarchies. People who do not benefit from this arrangement in terms of possessing privileged levels of status, wealth, and power still promote this agenda because they are biologically primed to want to see the world in this way because it is less emotionally troubling to think of the world as fair than it is to think of it as unfair, hostile, and dangerous (Neville, Coleman, Falconer, & Holmes, 2005; Phalet, Andriessen, & Lens, 2004).

Pratto, Sidanius, Stallworth, and Malle (1994) use the concept of "hierarchy-legitimizing myths" to elaborate on the beliefs about inequality and superiority that underlie social dominance orientation. These myths promote the institutionalization of discrimination and oppression because they allow individuals and social entities to feel justified in allocating resources inequitable (Sidanius & Pratto, 2004).

Social dominance orientation is an important "rule out" when evaluating the contributions of the CoBRAS because the Social Dominance Orientation scale has been found to be predictive of opposition to race-based redistributive social policy (Pratto, Sidanius, Stallworth, & Malle 1994) and prejudice (Guimond, Crisp, De Oliveira, Kamiejski, Kteily, Kuepper, Nour, Lalonde, Levin, Pratto, Tougas, Sidanius, & Zick, 2013; Guimond, Dambrun, Michinov, & Duarte, 2003). It has also been shown to be related to an array of ideological positions (e.g., meritocracy), as well as support for policies that have implications for intergroup relations, including new policies (Pratto, Stallworth, & Conway-Lanz, 1998). It is therefore possible that the relationship between color-blindness and opposition to redistributive social policies can be explained by individual differences in a more general construct such as SDO.

Attributions for "the Gap"

Political psychologists and sociologists have long held that people's policy preferences are driven, at least in part, by causal attributions they make for a given form of social stratification (Kluegel & Smith, 1986). Following that logic, how

people explain the causes of the Black-White achievement gap would be expected to be strongly related to what they think ought to be done about it. If the failure of Black students to achieve at the same level as White students is simply a matter of poor parenting and a negative cultural orientation toward schooling, there is no reason to "throw money at the problem" (Pearl, 1997; A. Thernstrom & S. Thernstrom, 2004). Conversely, if the schools systematically produce differential outcomes by apportioning resources on the basis of race and other social indicators, then redistributive policies might be the answer.

Previous research has shown that this is true with respect to the relationship between attributions for the Black-White achievement gap and attitudes toward various school reform policies aimed at closing it (Sperling & Vaughan, 2009). Using the Attributions for Scholastic Outcomes—Black (ASO-B), Sperling and Vaughan measured two dimension of causal reasoning about the gap: culture-blaming and structure-blaming. Culture-blaming was defined as the tendency to blame Black families and Black culture for setting Blacks students up for failure. By contrast, structure-blaming was defined as the belief that the school system systematically provides more desirable opportunity and reward structures to White students. Results of their analyses showed that structure-blaming was related to more favorable attitudes toward policies aimed at distributing resources toward predominately Black schools. Given that the CoBRAS and the ASO-B share ancestral roots in Bonilla-Silva's (1997) racial ideology theory, it is informative to determine whether the CoBRAS is still related to educational policy attitudes after controlling for attributional preference.

Method

Participants

A total of 166 participants completed the study. The majority of participants were students enrolled in a General Psychology course offered through the Psychology Department at a small, private University in the Southwest. These students received course credit in exchange for their participation. The remainder were referred to the study from the original pool via snowball sampling.

A clear majority of the participants were female (*n*= 106; 63.9%) and most self-identified as Latino (*n*= 108; 75.5%). The distribution of social class within the sample approximated a normal distribution with nearly half of the participants self-identifying as "middle class" (*n*= 73; 44.0%) and fewer identifying as "working class" (*n*= 38; 22.9%) or "upper middle class" (*n*= 30; 18.1%). A small number identified as either "lower class" (*n*= 11; 6.6%) or "upper class" (*n*= 8; 4.8%). The same was true for political orientation, as the largest number of participants identified as "middle of the road" (*n*= 65; 39.2%). Fewer claimed to be "somewhat liberal" (*n*= 30; 18.1%) or "somewhat conservative" (*n*= 34; 20.5%) and even fewer saw themselves as being either "very liberal" (*n*= 19; 11.4%) or "very conservative" (*n*= 18; 10.8%).

Instruments

The Attributions for Scholastic Outcomes Scale- Black (ASO-B). The ASO-B (Sperling & Vaughan, 2009) consists of 12 items that intend to measure the extent to which people endorse two different perspectives on the Black-White achievement gap: culture-blaming and structure-blaming. Each item reflects a cause associated with one of these two perspectives. Participants indicate the importance of each cause in perpetuating the Black-White achievement gap using a five point scale ranging from "Extremely Important" to "Extremely Unimportant"

with a "Neutral" midpoint. Higher scores correspond to higher levels of the traits.

Colorblind Racial Attitudes Scale (CoBRAS). The CoBRAS measures the extent to which one adheres to colorblind racial attitudes. It consists of twenty items, which are measured on a six-point scale ranging from "Strongly Disagree" to "Strongly Agree". The CoBRAS is comprised of three subscales: 1) Racial Privilege (RP), which refers to the denial of White privilege, 2) Institutional Discrimination (ID), which suggests that individuals are unaware of discriminatory institutional practices, and 3) Blatant Racial Issues (BRI), which suggests the denial of discrimination and racism in our society (Neville, Lilly, Duran, Lee, & Browne, 2000). Higher scores on the CoBRAS indicate higher levels of colorblind attitudes in participants.

Social Dominance Orientation-6 (SDO-6). The SDO-6 consists of 16 items and was developed to measure the extent to which participants believe that there is a natural and justifiable social order, where certain social groups are dominant over other social groups (Pratto, Sidanius, Stallworth, & Malle, 1994). Participants rate their agreement or disagreement with these statements from along a seven-point scale that ranges from "Strongly Disagree/Disapprove" to "Strongly Agree/Approve." Higher scores on the SDO-6 indicate higher levels of social dominance orientation.

The Attitudes towards School Reform-Black (ASO-B). The ASR-B (Sperling & Vaughan, 2009) was developed to test the relationship between how people explain the Black-White achievement gap and their attitudes toward different types of school reform. It measures the extent to which people believe that five different school reform strategies would be effective in eliminating the Black-White achievement gap. They are: (1) parent education; (2) teaching and enforcing "proper" English; (3) standardized testing; (4) resource redistribution; and (5) tracking. The ASR-B consists of 25 items, which participants respond to using a five-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree." Higher scores on each subscale correspond to more positive attitudes toward that particular school reform strategy. Given our hypotheses, only scores on the resource redistribution subscale were included in the analyses.

Procedures

All participants completed the CoBRAS, ASO-B, SDO-6, ASR-B, and a demographic questionnaire. In an effort to control for order effects, participants were randomly assigned to one of two conditions that corresponded to the order of the questionnaires they were asked to complete. Participants in Condition 1 were asked to complete the CoBRAS before the ASO-B. Participants in Condition 2 were asked to complete the ASO-B before the CoBRAS. In both conditions, the participants then proceeded to complete the SDO, the ASR-B, and the demographic questionnaire in that order.

Results

Item and scale characteristics

Composite variables were created to include in path analyses to test the primary hypotheses. They were created by summing scores on each item within a subscale. For CoBRAS, there were three subscales, which were referred to as RP, ID, and BRI. Item characteristics for CoBRAS can be found in Table 2. For the ASO-B, there were two subscales: culture-blaming (CB) and structure-blaming (SB). Because we were primarily interested in testing hypotheses related to attitudes toward resource redistribution, scores on the items associated with that construct were extracted from the

ASR-B and used in the creation of the composite variable.

Before initiating the main analyses, the internal consistency of each subscale was assessed. A summary of the findings appears in Table 1. Cronbach's alpha estimates indicated that scores from the subscales of CoBRAS were lower than anticipated, but not so low as to be problematic. ID was the strongest subscale (α= .63) with BRI producing scores that were slightly less internally consistent (α= .60). Racial Privilege was the weakest (α= .58) of the subscales. Among the mediators, SDO-6 scores were the most reliable (α= .92), but the CB (α= .87) and SB (α= .83) subscales of the ASO-B also performed well. The dependent variable, scores on the resource redistribution subscale of the ASR-R, were also shown to be sufficiently internally consistent (α=. 73).

Model testing

The primary purpose of our study was to test whether the CoBRAS predicts policy attitudes over and above other popular instruments. We operationalized this by examining whether its subscale scores are statistically related to attitudes toward resource redistribution after controlling for the effects of attributions for the Black-White achievement gap as measured by the ASO-B and social dominance orientation as measured by the SDO-6. The first step was to establish whether CoBRAS scores are related to attitudes toward the criterion variable without mediators included in the model. Results of a regression analysis suggested that RP (β= -.227; *p*= .001), ID (β= -.172; *p*= .020), and BRI (β= -.235; *p*= .001) are all statistically related to attitudes toward negative views of resource redistribution, which is consistent with our original hypothesis.

Next, a full model was specified to include the resource redistribution variable regressed on all three of the CoBRAS subscale scores with the two ASO-B subscale scores, CB and SB, and the SDO-6 score serving as mediators. The goodness-of-fit for each of the remaining models was determined by the value of chi-square. However, since chi-square tends to be sensitive to sample size (Jöreskog and Sörbom, 1993), additional information about model fit was obtained from the CFI and SRMR statistics. CFI scores equal to or above .95 and SRMR scores equal to or less than .08 are considered to be indications of good fitting models (Hu & Bentler, 1999). Based on these standards, the results of the path analysis indicated that the original model had poor fit ($\chi^2(3)= 101.577$, $p < .001$; CFI= .543; SRMR= .114). The path values are illustrated in Figure 1.

The results of the path analysis gave direction for correcting model misspecifications. Statistical tests associated with each of the independent variables and the mediators indicated that CB and SDO-6 are not statistically related to resource redistribution, so those variables were essentially superfluous. Furthermore, ID was unrelated to SB, so SB was set to be a mediator of RP and BRI. This restricted model achieved good model fit ($\chi^2(1)= .047$, $p = .889$; CFI= 1.000; SRMR= .004). In total, the model accounted for approximately 27 percent of the variance in scores on the resource redistribution measure.

An analysis of the individual path estimates provides additional information about the unique contributions of each predictor variable. As Figure 2 illustrates, SB is predictive of resource redistribution. In fact, it has the largest direct effect on resource redistribution of all the predictor variables. This finding should be interpreted cautiously, however, because we did not test a model in which CoBRAS scores functioned as mediators of the relationship between SB and attitudes toward resource redistribution, so it is possible that the

observed relationship would be greatly reduced if the model were specified differently.

More encouraging news about the nature of the CoBRAS comes from the fact that all three subscales contributed approximately equally to the prediction of attitudes toward resource redistribution and in the expected direction, even after accounting for the effect of SB. Only ID was affected by the presence of SB in the model, suggesting that there are relationships between two of the CoBRAS subscales and the SB construct, but that the two subscales contribute to the prediction of the criterion over and above SB.

Discussion

The new era of racism is best described as one of culture-blaming color-blindness and nowhere is this trend more salient than in how people make sense of race-based educational achievement gaps. Operating from that theoretical perspective, the present study sought to distinguish between several different explanatory variables that contribute to negative attitudes toward race-conscious educational policies and, in so doing, to add to the knowledge base concerning the psychometric properties of the CoBRAS.

Our results indicate that the CoBRAS is statistically related to attitudes toward resource redistribution. This suggests that people reject or support egalitarian funding policies due at least in part to their adherence to color-blind principles. That all three CoBRAS variables were predictive provides strong evidence of the importance of color-blindness in the formation of political attitudes and the coherence of the color-blindness construct as it was applied to the construction of the CoBRAS.

An even more impressive discovery was that CoBRAS scores maintained a statistically significant relationship with attitudes toward resource redistribution even after controlling for other important traits. For their part, neither CB nor social dominance orientation appeared to be efficient mediators or predictor variables. However, SB was strongly related to the political attitude in question, and all three CoBRAS variables were still statistically significant predictors even with structure-blaming in the model.

Limitations and Future Directions

Although some of the psychometric properties of the CoBRAS have been vetted elsewhere, questions remain as to their properties within the population we sampled in this study. The observed internal consistency estimates were somewhat lower than expected. Moreover, the data were not subjected to factor analysis to ensure that the items loaded on their proposed parent constructs. Additional research on Latinos needs to be performed, including tests of model invariance, to determine whether CoBRAS is appropriate for this population.

Our analysis was also restricted to an exploration of how CoBRAS scores predicted attitudes toward resource redistribution. While the results were encouraging, there is still room for additional analyses of the relationships between the CoBRAS and attitudes toward other types of school reform policies, some of which are included in the ASR-B. For example, it would be reasonable to expect that a color-blind perspective would be positively related to attitudes toward English-only initiatives that forced Latinos to learn the “official” language of the school. The culture-blaming element nested within the CoBRAS might also be related to positive attitudes toward tracking. This would be especially likely if the stimulus suggested that counselors would be channeling Black and Latino students into vocational programs and White and Asian American students into college preparatory courses.

Research in this domain will enable advocates of Black and Latino students to exploit the public's perceptual tendencies and fears of being labeled in unsavory ways. As it stands, people are perfectly willing to lend support to policies that reinforce the status quo and, by virtue of doing so, to reproduce inequality. However, they are also loath to admit that they are racially prejudiced. If advocates can make subtle connections between culture-blaming and color-blindness on one hand and racism on the other, those who have traditionally hidden behind the dominant racial ideology will feel more pressure to rethink their position on race-conscious policies.

Admittedly, it may be somewhat naïve to think that a sociological problem such as racism can be eradicated simply by attacking an ideology. Racism is a means of protecting wealth and privilege and ideologies are simply tools that aid and abet that bigger goal (Bonilla-Silva, 1997). Ideologies have changed over time to serve those interests, and people have been more than eager to adapt to whatever belief system has been bestowed upon them if they are led to believe that they stand to benefit from it. But, perhaps some good can come during the transition phases when people's fear of being exposed as racist keeps them from opposing policies that can actually help reduce social stratification within the schools and at the sociological level more generally.

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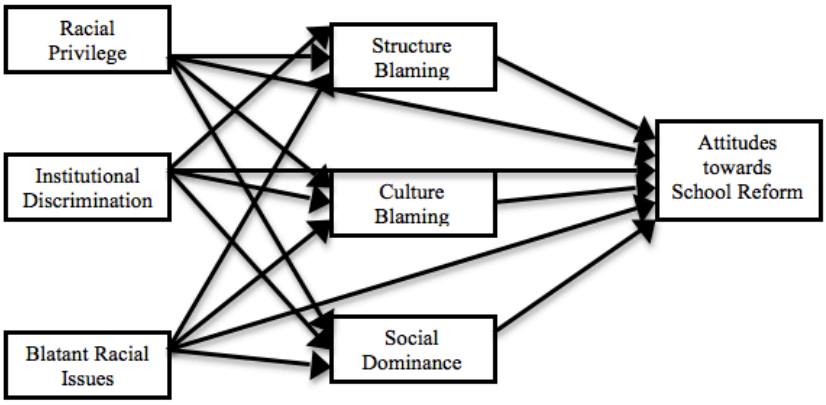
Figure 1
Full Model of Predicted Relationships including Mediators

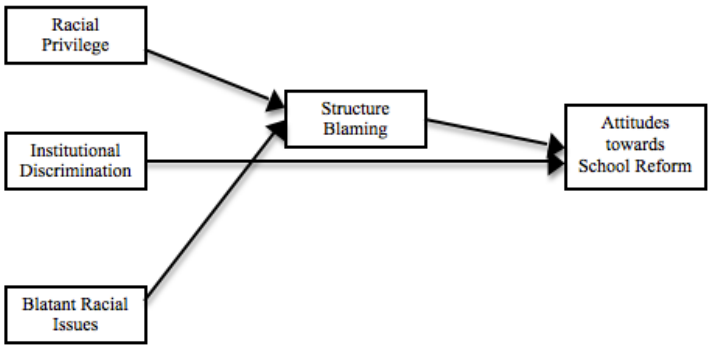


Path Values in Relation to Figure 1

	Dependent Variable			
Independent Variable	CB	SB	SDO	Resource
Racial Privilege	.027	-.180*	-.170*	-.163*
Institutional Discrimination	.126	.017	.192*	-.149*
Blatant Racial Issues	-.261*	-.230*	.406*	-.140
Culture- Blaming	–	–	–	-.096
Structure- Blaming	–	–	–	.381*
Social Dominance	–	–	–	-.069

Note. $*p < .05$

Figure 2
Final Model with Mediation



Path Estimates

	Dependent Variable	
Independent Variable	SB	RR
Racial Privilege	-.181	-.168
Institutional Discrimination		-.177
Blatant Racial Issues	-.225	-.160
Structure-Blaming		.327

Table 1

Reliability estimates by subscale for each instrument

Scale including Subscales	Chronbach's Alpha (α)
CoBRAS	
Racial Privilege	.58
Institutional Discrimination	.63
Blatant Racial Issues	.60
Attributions for Scholastic Outcomes	
Culture-Blaming	.87
Structure-Blaming	.83
Social Dominance Orientation	.92
Attitudes toward School Reform	.73

Table 2

Item Characteristics of CoBRAS Subscales

Subscales with Items	Skewness	Kurtosis	Mean	Std. Dev
Racial Privilege				
Item 1	.52	-.30	2.98	1.40
Item 2	-.47	-1.01	4.34	1.56
Item 3	-.14	-.87	4.27	1.86
Item 4	.40	-.67	3.08	1.48
Item 5	.26	-.75	3.33	1.48
Item 6	-.79	-.58	4.53	1.59
Item 7	-.30	-.77	3.84	1.53
Institutional Discrimination				
Item 8	.18	.57	3.17	3.00
Item 9	.39	-.94	2.89	1.58
Item 10	.54	-1.05	2.85	1.74
Item 11	.09	1.20	4.06	2.13
Item 12	.00	-.52	3.73	1.34
Item 13	.00	-1.49	4.18	2.29
Item 14	-.06	-.82	3.52	1.47
Blatant Racial Issues				
Item 15	.96	.38	2.52	1.32
Item 16	.13	-.95	3.37	1.53
Item 17	.47	-.40	2.78	1.34
Item 18	1.10	1.03	2.10	1.18
Item 19	.79	.31	2.45	1.26
Item 20	.76	-.27	2.49	1.43

An International Cross-Sectional Study of Factors Affecting Fertility Rates

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Introduction

Throughout human history, population has been viewed as society's measure of health, wealth, influence, and above all, power. For centuries humanity has operated on the seemingly irrefutable logic that growth is good; however since the turn of the 20th century, the global population has increased exponentially, creating the illusion of a population spiraling out of control, engendering the fear of an impending demographic time bomb that would lead to a lack of sustainability. However, since the beginning of the 21st century, a new trend has become visible, presenting its own unique set of problems. Total fertility rates around the world are falling, implying that some, if not most, countries will begin to experience a decrease in population in the future. Some have already done so.

There is a growing imbalance between the number of young people and the elderly they support. There are exceptions, such as sub-Saharan Africa, but generally, regardless of religion, geography, or income, the replacement rate has decreased around the globe. The consequences of this phenomenon are vast and varied (United Nations Population Fund [UNFPA], 2011). The purpose of this paper is to analyze the factors that influence fertility rates across countries. An understanding of these factors is important in projecting future population trends in various nations, and assisting public policymakers who may wish to craft policies to influence fertility rates.

Population Trends: The Past and the Future

In 1804, the global population was approximately 1 billion people; it then doubled over the course of a little more than a hundred years by 1927. Nearly a third of a century later, there were 3 billion people on the planet, and today the population is about 7 billion. This growth is expected to continue well into the 21st century. Estimates are that the population in 2050 will be 8.9 Billion. It is critical to understand and determine the causes of population growth because, if it is not entirely due to the high birthrates, then what is the cause?

The answer is elegant in its simplicity; since the early 1950's, human beings are no longer dying at the rate they once did due to increased access to modern health care, clean drinking water, and basic sanitation (United Nations Population Fund [UNFPA], 2011). Expected lifespan has lengthened from 46 to 66 years and infant

mortality has decreased by half and is expected to decrease an additional two thirds by 2050. (UNFPA, 2011)This is what has led to a rapidly increasing population.

Population is changing unevenly. African and Asian countries have experienced the most growth. In 1960, Africa comprised a mere 9% of the world's population; that percentage is projected to reach 20% by 2050. Within that same time frame, Asia's population will have doubled.

The worry of overpopulation has plagued scientists, politicians, and economists alike. However, as we begin the 21st century, a new trend has begun to develop. The total fertility rates (TFR), the average number of children a woman would bear if she lived out her reproductive lifespan, have dropped across the globe, with some exceptions in the under-developed world. This single statistic of TFR is instrumental in developing predictive models for population trends and forecasting their effects on labor markets, food, pension systems, the environment, and the economy on a global scale (Alkema et al., 2011). Global fertility rates have fallen by more than 40 percent since 1950. Almost every European country has a TFR less than 2.1, which is the rate developed countries must maintain if they are to sustain their population. In fact, only 3% percent of the world's population lives in an area where population is increasing.

On the surface this future reduction in population is seemingly a good thing, as resources become scarce and concerns arise about an impending energy crisis. However, such a stark decrease in population can have dramatic economic consequences. This is the first time in modern history that the current population is aging to the point where young people, who pay into the system to support the elderly, will be outnumbered. This will make it extraordinarily difficult to fund current programs for the elderly in countries across the globe. Additionally, according to an article by economist Gary S Becker, "The majority of innovation comes from inventors who are below 50, often far younger" (Becker, 2006). Given this fact, declining fertility rates will impede the two most influential factors in economic growth: technology and innovation.

In addition to economic instability, declining fertility rates can also create potential political and military disadvantages for a nation. Japan, which has one of the lowest fertility rate, is a primary example. In light of this problem, Japan is faced with a decreasing labor pool and a growing number of elderly, which is preventing soldier recruitment among the youth and stressing government budgets. Consequently, in the geopolitical context, Japan is placing itself at both a military and political disadvantage. Now, imagine this situation replicated across the world. While the idea of a world filled with nonviolent elders sounds appealing, the likelihood of a peaceful situation being reached is doubtful ("Population Implosion," 2013, p. 28).

There has never been another time in history where people have lived for so long so well, and though humanity is experienced in dealing with adversity, this particular situation is somewhat unprecedented and the global scale on which it is taking place is daunting (United Nations Population Fund [UNFPA], 2012). As the population that was booming begins to age (and die), new issues will arise in the coming decades. This process has already begun in the more developed parts of the world, such as Western Europe. Population decline, systematic support for the elderly, and a shrinking labor pool are just some of the issues facing countries (Lutz, Sanderson, & Scherbov, 2005).

The decrease in fertility rates did not happen overnight. According to Alkema et al. (2011), it occurred in three phases. The first phase consists of countries that have stable pre transition high fertility rates. The second phase consists of the transition from high fertility rates to replacement level or lower rates. The third phase consists of post transition low fertility, which includes countries recovering from rates below the replacement rate. This transition, when mapped using Alkema's Bayesian model, is depicted as occurring over time in gradual increments, which means any recovery will take time as well. (Alkema et al., 2011, p. 4)

Potential Contributors to Declining Fertility

Research has identified a number of factors that may have led to this widespread decline in fertility and which may explain differences in fertility rates across countries. A primary factor affecting total fertility is the amount of social opportunity available in a country, particularly those opportunities available to women. The term social opportunity can be defined as the number of options available to the general public that promote healthier lifestyles and decisions, which allow the intrinsic and holistic development of persons.

Education

A primary component and catalyst for this transition in social mind frame regarding family and fertility has been education. Over the past four decades, literacy has increased throughout the world. Enrollment rates in primary education have increased in all regions except sub-Saharan Africa. "In low and middle income countries, 53% of the relevant age group were enrolled in secondary schools in 1995, up from 41% in 1980," (United Nations Population Fund [UNFPA], 2012).

This growth in educational opportunities plays a key part in transforming social expectations, especially for women. "In order to promote this change, a number of countries have begun to implement waivers, or provide a small payment or food allocation for girl's attendance, and by adapting the school system to facilitate their participation." (UNFPA, 2011) One correlation that stands out in particular is the relationship between mothers' education level and infant mortality. "More-educated mothers have better health care, marry later and are significantly more likely to use contraception to space their children. They have better skills for obtaining and evaluating information on health care, disease prevention and nutrition, and as a result are more likely to birth and raise healthier children. They also have better access to resources, through earning opportunities and marriage, and can manage them better. They are more likely to recognize the advantages of educating their children." (UNFPA, 2011)

Health Care and Family Planning

Closely correlated with education are the issues of health care and family planning. As mentioned women with a higher level of education are better able to utilize family planning, contraception, maintain a stable income, marry later and richer, and understand healthcare and make the most of its benefits. All of this tends to lead to lower fertility rates.

In 1999 the international community agreed that family planning should be available to whoever wants it, despite the fact that it tend to lower fertility rates. However, according the UNFPA, an "estimated 222 million women lack access to reliable, high-quality family planning services, information and supplies, putting them at risk of unintended pregnancy."

(UNFPA, 2012, p. 1) Possible underlying factors that inhibit family planning structures are poverty, social pressures, and gender inequality, and while not one of these factors is positive, they altogether act as an incubator for high total fertility rates; and the question is how one propagates health and quality of life while striving to maintain a healthy population and replacement rate. (Levine, What Works Group and Kinder, 2004).

Urbanization

Another phenomenon impacting fertility rates is urbanization. According to *Unleashing the Potential Growth* (2007), "The world is undergoing the largest wave of urban growth in history. In 2008, for the first time in history, more than half of the world's population will be living in towns and cities. By 2030 this number will swell to almost 5 billion, with urban growth concentrated in Africa and Asia." Cities favor stronger infrastructure and foster social opportunities and growth a great deal more than their rural counterparts; "lowering poverty, empowering women and providing quality reproductive health services all influence fertility preferences and the ability to meet them." Therefore, urbanization acts as an indirect contributor to fertility decline as families adapt to these new settings.

Methodology, Data, & Variable Descriptions

This study will use an ordinary least squares regression to examine and evaluate the impact of several variables on total fertility rates across countries. The independent variables included in the regression analysis are GDP per capita, percentage of students enrolled in secondary education who are female, percentage of students enrolled in tertiary education who are female, percentage of women in the labor force, and percentage of females between the ages of 15-19 that are married. The variables were selected based on the discussion above, which indicated their potential importance in explaining fertility rates. Each variable was measured across 138 different countries ranging from Oceania to the Americas using a cross sectional analysis. I ran a regression to determine if a statistically significant relation exists between the independent variables and the output, TFR

Explanatory Variables

Percentage of Secondary Enrollment Comprised by Women

According to the 1997 International Standard Classification of Education (ISCED 97), secondary school consists of two parts: lower level secondary education and upper level secondary education. Lower secondary education continues the basic programs of the primary level, although teaching is typically more subject-focused. Upper secondary education is usually the final stage of secondary education in most countries with strongly organized subject instruction. "The girls' share of secondary enrollment refers to the percentage of students enrolled in secondary education who are female. This indicator helps assess gender disparity with regard to participation in secondary education. When the indicator approaches 50% it reflects a good level of gender parity." (UNESCO Teaching and Learning for a Sustainable Future Website, 2010)

Percentage of Tertiary Enrollment comprised by Females

Tertiary education, according the ISCED, is defined as education level 5 and 6. Level 5 includes programs that are researched based or provide access to high skill professions. Level 6 caters purely to advanced research and is the equivalent of doctoral studies. The women's share of tertiary enrollment refers to the percentage of students enrolled in tertiary education who are female. "This indicator helps assess

gender disparity with regard to participation in tertiary education. When the indicator approaches 50% it reflects a good level of gender parity." (UNESCO Teaching and Learning for a Sustainable Future Website, 2010)

Education level Secondary & Tertiary: History and data have proven that women who are educated have smaller and healthier families. This occurs because "more-educated mothers have better health care, marry later and are significantly more likely to use contraception to space their children. They have better skills for obtaining and evaluating information on health care, disease prevention and nutrition. They also have better access to resources, through earning opportunities and marriage, and can manage them better." (UNFPA, 2012)

Gross Domestic Product per Capita

Per capita gross domestic product (GDP), in US dollars, is the total unduplicated output of economic goods and services produced within a country as measured in monetary terms, according to the United Nations System of National Accounts (SNA). The exchange rates used for the conversion of national currency data into US dollars are the average market rates as published by the International Monetary Fund in the International Financial Statistics. Official exchange rates were used only when a free market rate was not available.

GDP's relation to fertility rates is paradoxical, in that most countries that have a high GDP also have a very low fertility rate, but there is nothing about the socio-economic structure that prevents that country from having a high fertility rate. A plausible explanation is that because countries with high GDPs tend to have strong national infrastructures, their citizenry has capitalized on the social opportunities available to them.

Female Labor force Participation Rate

The share of women in the adult labor force refers to the percentage of the economically active people who are women. Economically active is "defined as all employed and unemployed persons, including those seeking work for the first time. It covers employers operating unincorporated enterprises, persons working on their own account, employees, unpaid contributing family workers, and members of producers' cooperatives and members of the armed forces." (UNESCO Teaching and Learning for a Sustainable Future Website, 2010)

Percentage of Female population between ages 15-19 ever married

"The percentage of ever married women in the age group 15 to 19 years refers to the percentage of women in that age group who are currently married and those who had been married in the past and are currently divorced or widowed." The indicator is a useful measure of the prevalence of marriage at young ages. It is expected that a high percentage of women who get married at an early age will have a positive effect on total fertility rates because they are inclined to have more children throughout their lives. (UNESCO Teaching and Learning for a Sustainable Future Website, 2010)

Data and Methodology

All of the data for this paper was gathered from the United Nations' Statistic Division: Demographic and Social Statistics- Statistics and Indicators of men and women. It covers 137 different countries from different regions around the world. Regression analysis is used to determine if statistically significant relations exist between the independent variables and the variable of interest, total fertility rate.

Results

Correlation Analysis

Total Fertility Rate	GDP Per Capita	(%) Female Population Between Ages 15-19 ever married	(%) of Female Employees in Labor Force	(%) Women Enrolled in Secondary Education	(%) of Female Tertiary Education Enrollment
1					
-0.444017576	1				
0.718096361	-0.503530887	1			
-0.274531448	0.353866033	-0.341549245	1		
-0.482526734	0.102498894	-0.420253634	0.150155909	1	
-0.640011003	0.282222797	-0.59425324	0.312292036	0.548785682	1

The correlations among the variables are presented in the table above, while this shows correlations, conclusions can on only be drawn from the regression below.

Regression

	Coefficients	Standard Error	t Stat	P-value
Intercept	5.834037312	1.039000856	5.615045725	1.11E-07
GDP Per Capita	-8.32027E-06	3.74778E-06	-2.220054517	0.028121
(%) Female Population Ages 15-19 Ever Married	0.044381719	0.007838087	5.662314921	8.92E-08
(%) of Female Employees in Labor Force	0.001237953	0.00234558	0.527780913	0.598537
(%) Women Enrolled in Secondary Education	-0.046569076	0.02218034	-2.09956546	0.037671
(%) of Female Tertiary Education Enrollment	-0.029096397	0.007945618	-3.661942349	0.000361

In the table above a P-value of less than 0.10 means that the variable has a statistically significant impact on the total fertility rates. As noted, every variable is significant, except the percentage of women in the labor force. A positive regression coefficient on a variable means that variable has a positive impact on fertility rates, while a negative coefficient implies an inverse relation. As expected, GDP per capita has a negative and statistically significant impact on fertility rates. This is likely due to the healthcare, education, and other social opportunities that a strong national infrastructure provides.

The percentage of secondary enrollment comprised by females also has a negative impact on fertility rates. Women who are educated tend to have fewer and healthier children, which may be linked to their improved ability to understand and utilize the resources available to them. A negative effect is also found for tertiary levels of education; a possible explanation is that women who continue to pursue education marry later in life, and as a consequence have fewer children.

The percentage of women married from ages 15-19, as predicted, has a positive impact on fertility rates. This is unsurprising, since women who marry at a younger age are likely to have more children. Also, a high percentage of young women getting married may potentially indicate a more family oriented society.

Implications & Conclusion

Given that the results support the hypotheses that higher GDP, a greater percentage of women in the workforce, and

higher levels of female education all contribute to lower fertility rates, developing a plan to increase fertility rates is a significant challenge. Nations that wish to increase fertility rates are unlikely to want to do so by lowering GDP or reducing females' access to education or their participation in the labor force. Across the world, governments on both the local and international level must deliberate about how to address this problem. Economists, demographers, and politicians will have to collaborate and develop creative ways to combat this trend. Such efforts have already met with some success. Riche (2004) indicates that there is evidence of effectiveness of approaches such as encouraging flexible work arrangements, providing financial benefits for having children, and subsidizing childcare. In France, the government has already reacted to the stark decline in fertility by implementing these kinds of policies. As a result, France now has one of the highest fertility rates in Europe.

With the shift in population trends comes a shift in mindset, raising the question: what does the future hold? As it stands, in time the underdeveloped countries of the world will have the largest youth population and potential labor pool. This could have profound implications for nations across the globe. "Countries with populations of 10 million or more and more than 40 percent of the population under age 15 include such troubled spots as Afghanistan, Iraq, Saudi Arabia, Nigeria, and Sudan. It is hard to avoid the fear that large and growing numbers of unemployed youth threaten world stability." (Coleman & Rowthorn, n.d.)

Whether an unprecedented global population decline is imminent or not, and despite the fact that we do not really know the full implications of such a decline, the only certain thing is that change is happening across the globe. Therefore governments and societies are going to have adapt and evolve to fit these new circumstances. If it is determined that population decline has vast, negative effects on the socio economic stability of countries, then policies will have to be formed and adapted to address the issue. How these issues will be addressed is unknown but there are several prescribed plans of action, which if implemented would help offset the majority of negative effects associated with a decreasing population ("Population Implosion," 2013).

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The Healing Effects of Subliminal Classical Music Theory on Stress Levels in College Students

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Abstract: *The purpose of this study was to explore subliminal classical music theories (i.e., consonant and dissonant music) as it relates to stress levels in college students. Previous studies have not investigated which specific types of classical music can better reduce stress. Therefore, this study aimed to find which type of subliminal music theory (i.e., consonant or dissonant) can influence stress levels. Sixteen college students throughout the United States participated in an online study. The State Trait Anxiety Inventory for Adults (STAIA; Spielberger, Gorsuch, & Lushene, 1970) assessed students' stress levels at three time points after stress inducing tasks (i.e., arithmetic tasks) and listening to both music samples. It was hypothesized that listening to either classical music sample (i.e., consonant or dissonant) would reduce stress. It was also expected that consonant music would have a greater impact on stress level reduction compared to dissonant music, given its harmonic tones. Results revealed that listening to either classical music piece significantly reduced stress levels, which supported the first hypothesis. However, there were no significant results evident when comparing the effects of music theories (i.e., consonant or dissonant) on stress. A reason for no significant results, when comparing both music theories, could be the small sample (n = 16). Overall, this study is important because it showed the positive influence of classical music on stress levels (i.e., reducing stress in students regardless of consonant or dissonant music theory). Thus, this study has implications for music therapy by identifying which type of classical music can better reduce stress.*

There are numerous ways to overcome physiological and psychological afflictions. An innovative and more recent approach to healing people with such conditions is through music therapy. Healing through music has evolved as a powerful resource and method for therapists and psychologists today. According to Trappe (2012), music therapy has the ability to evoke calming or positive emotions and plays an important role in health. Based on its recent popularity, music therapy has successfully impacted human stress and anxiety. Currently, studies have been conducted to test music therapy's ability to affect stress levels by focusing on behavioral responses while listening to music. That is, the responses observed from music listening, can be extensively used for emotion regulation resolutions in music therapy (Thoma, Scholz, Ehlert, & Nater, 2012; Zentner, Grandjean, & Scherer, 2008). The purpose of this literature review is not only to present the findings of previous studies, but to present the negative effects of stress and how music therapy can and has been used for stress reduction. In summary, the former research presented subsequently supports the primary goal of the current study, which is to identify what type of

subliminal classical music, (i.e., consonant or dissonant) better reduces anxiety in college students.

Negative effects of stress

Stress is an emotional state of being that is common in many aspects of life and is caused by various emotional or circumstantial factors (Yehuda, 2011). Stress is one of the most common causes of psychological and physiological afflictions. It presents problems that can significantly affect an individual for long periods of time. Stress has also been shown to lead to various health problems such as heart disease, high blood pressure, hypertension, back pain, sexual dysfunction, autoimmune disorders, and sleep disturbances (Bae 2012; Jiang, Zhou, Rickson, & Jiang, 2013).

With these long lasting health risks, stress can lead to threatening diseases. Stress is prevalent in social environments such as the work place, household and educational settings. College students are a vulnerable population that can fall prey to stress. Specifically, it has been shown that as students get older, their anxieties increase over time, which can cause deterioration of concentration (Mohammadi, Shahabi, & Panah, 2011). In other words, constant deadlines and numerous amounts of time spent to finish assignments can push students to examination anxiety. This in turn can create issues with low self-esteem and ineffective learning processes. In addition within college students, the prevalence of sleep and food disorders, depression, alcoholism, interpersonal conflict and exhaustion often increase (Sharma & Jagdev, 2012; Bae, 2012), which can lead to heightened levels of stress.

One that faces stress is more at risk for physiological and psychological problems. In a study examining music's effects on breathing intervention, Miller and Spence (2013) stated that a large amount of tension could cause fluctuation in breathing abilities, concentration, and emotion. Mental illness such as depression and anxiety are often comorbid with stress. Conditions induced by large amounts of stress can escalate into more serious symptoms such as fatigue, increased heart rate and panic attacks. Thus, it is understood that stress is not only an unavoidable part of our lives, but it seems like there is no way to rid ourselves of this type of despondency. It is not uncommon to experience stress; however, it can be difficult to find an appropriate and successful way to significantly reduce it.

Measurement of stress

A common measurement of stress in adults is the State Trait Anxiety Inventory for Adults (Spielberger, Gorsuch, & Lushene, 1970), specifically as a way to measure emotional stress levels. STAIA is an inventory of 40 questions that allows participants to indicate what they are feeling "at the moment" and in general. Thus, STAIA is a self-reporting measure that reflects stress levels through psychological means as opposed to physiological means.

Music therapy and stress

Music therapy is the use of music to lessen one's pain or even cure a person afflicted with stress or depression (Koen, 2006). Therapists have used music-based therapies to help alleviate changes in mental capacities (Mohammadi, Shahabi, & Panah, 2011). Specifically, the music used during this type of therapy is aimed to induce relaxation and restore memory. Research has found that music can also stimulate production of endorphins, reduce levels of cortisol and noradrenaline, and change hormonal levels/physiological signals that indicate stress levels have been reduced (Mohammadi, Shahabi, & Panah, 2011; Sharma & Jagdev, 2012). Therefore, therapeutic music is a remedy to combat

stress and anxiety. Throughout the years, music therapy has shown to beneficially affect stress-related physiological, in addition to cognitive and emotional processes (Thoma, et al, 2013). For example, music can relax postpartum pregnant women during the first stage of giving birth (Tseng, Chen & Lee, 2010). It can also increase self-esteem in adolescents (Sharma & Jagdev, 2012), and it can even replace midazolam, a pharmaceutical drug used before surgery, to create a calming and anxiolytic effect (Bringham, Giesecke, Thorne, & Bringham, 2009). Music therapy is not only used for relaxation purposes but also for intervention purposes to help improve mood and concentration (Trappe, 2012).

In general, music seems to have had a stress reducing impact. Refer to Table 1, which highlights methodologies and outcomes of former music therapy studies. Particularly, Tseng, Chen, and Lee (2010) investigated if music could reduce stress levels in postpartum women. They found that even though music did not have any evident effects in stress level reduction, music did induce relaxation for postpartum women. Additionally, Sharma and Jagdev (2012) examined if music therapy could enhance self-esteem in adolescents. Yet again, music had a significant impact given that they found that music therapy positively enhances self-esteem. With further corroboration, Jiang, Zhou, Rickson, and Jiang (2013), assessed whether preferred or unpreferred music (either stimulative or sedative) could reduce stress levels. The results revealed it does not matter whether the music is stimulative or sedative, as long as the music is preferred it can reduce stress levels. Lastly, Thoma and colleagues (2013) investigated the effects of music on the human stress response. They found that music strongly affects the autonomic system, meaning that music influences a faster autonomic recovery. For music to slow heart rate and reduce cortisol levels (physiological signs of stress), it can be interpreted that music has an impact on stress reduction. These four studies aforementioned studies used the State Trait Anxiety Inventory for Adults (STAIA; Spielberger, Gorsuch, & Lushene, 1970) or a comparable other to measure stress. As displayed in Table 1, all four studies emphasize that music does indeed have an effect on the human experience. As was stated earlier, music has had a significantly positive impact on stress.

Lack of music analysis research

Music theory is the structure and formula of music. Essentially, it is not only a foundation but it also contains the subliminal process of music. The secret to unlocking music's ability to heal is potentially in the intricate theory behind the piece being played. Trappe (2012) stated that music's combination of frequency, beat, density, tone, rhythm, repetition, loudness, and lyrics make music beneficial to one who has a lot of stress. All the aforementioned factors combined are the elements that comprise music theory. No research has investigated the relationship of a particular music piece's association with stress; however, there are some speculations. In other words, how does music theory influence music actually reducing stress?

Previous, and recent, literature mentions that classical music has the most significant stress level reduction compared to other genres of music, such as Jazz and Pop (Jiang, Zhou, Rickson, & Jiang, 2013; Trappe, 2012; Yehuda, 2011; Bringham, Giesecke, Thorne, & Bringham, 2009; Chafin, Roy, Gerin, & Christenfeld, 2004). Interestingly, Bringham, Giesecke, Thorne, and Bringham (2009) found that music is the most relaxing when it mimics the heart rate

at rest, which on average is a pace of 60-80 beats per minute. Thus, musical tempo is an indicator of the degree to which music will influence the listener's stress (Egermann, Kopiez, & Reuter, 2007). Even though there are studies that show how classical music phraseology can evoke emotion, research has yet to investigate what type of classical music can impact stress. Currently, research suggests that more melodic tones evoke more emotion. In particular, Egermann, Kopiez, and Reuter (2007) stated that subliminal perception is characterized by perception without awareness. This lack of auditory awareness is when the subliminal part of classical music is introduced. *Subliminal music* is the theoretical design within a musical composition. In its core, subliminal music is music theory. For the purpose of this study, these terms are considered synonymous. Subliminal music, or the theory inside a musical composition, can be the element that highlights what exactly in classical music can significantly impact stress. Thus, two types of known music theories investigated in this study are: dissonance and consonance.

Dissonant and consonant music

Dissonant music is a type of music that has unstable and minor sounding tonalities. Music formulated with dissonance usually contains minor seconds with plenty of seventh chords. This type of music gives the listener a strong feeling that the dissonance must be resolved to a clearer and more harmonic sounding tone. Some examples of dissonant music are Jazz improvisation as well as contemporary classical music such as *The Sunken Cathedral*, written by impressionist French composer, Claude Debussy. Another example of dissonant music is Khachaturian's Toccata in E flat minor, which was used in the current study.

In contrast, *consonant music* is a type of music that is predictable with stable tonalities. It harmonically flows with intervals, such as major thirds and sixths. It generally contains a symmetrical formula and is usually relaxing and pleasing to the ear. This type of music is well connected and contains a simplistic and natural chord progression. An example of consonant music is *Canzonetta Sull'Aria*, written by Wolfgang Amadeus Mozart, which was used in the present study.

Both dissonance and consonance are in all types of music, but they are hidden subliminally – meaning that the theory is being masked while the piece is being played. Dissonance and consonance can occur simultaneously, but there are some pieces that are either entirely dissonant or entirely consonant. Some dissonance and consonance are more distinctly heard in some music pieces compared to other music pieces; however, considering the contribution of these theoretic formulas, it can optimally show what kind of music is best for reducing stress. To date, there is no research that has studied the subliminal consonance and dissonance in music; thus, it should be explored to advance the effects of healing via music therapy.

In summary, research commonly highlighted that music, particularly classical music, had the greatest impact on reducing stress and anxiety levels. This consistent finding poses questions such as: What makes classical music different? Why do certain classical music pieces impact stress more than others? Which type of classical music, consonant or dissonant, better reduces anxiety? However, it remains unknown which type of classical music can better reduce stress.

Purpose of current study

Given that there are many types of classical music, the current study assessed

the subliminal theory behind consonant and dissonant music, given that these two types of music are the basis from which other types of classical music stem. The targeted sample for this study was college students, because based on research the college student population and university environment have been used frequently to investigate music therapy effects on stress reduction. Overall through consonant and dissonant music, this study aimed to understand whether or not there is a positive, negative or no effect on stress level reduction within college students based on music theory.

Hypotheses

First, it was expected that classical music would significantly reduce stress levels. In other words, stress levels after listening to both music samples (i.e., STAIA reports at Time 3) will be significantly lower than stress levels at baseline (i.e., STAIA reports at Time 1). Second, it was hypothesized that consonant music would have a more significant effect in reducing stress levels compared to dissonant music. This was anticipated given that consonant music has more harmonious tones and is more pleasing to the ear compared to dissonant music.

Method

Design

This study was a within-subjects experimental design (i.e., college students participated in both consonant and dissonant music conditions).

Participants

Participants in this study were undergraduate students (n = 16) enrolled in colleges/universities within the United States. The original sample was 19 participants; however, 3 participants were not included in subsequent analyses due to incompletion of the survey for unknown reasons. An inclusion criterion for participants was adequate hearing. Because participants listened to music samples, adept hearing was required. The sample included 4 males, 11 females, and 1 unreported. The ages of the participants ranged from 18 years to 23 years old (M = 20.31, SD = 1.35). The ethnicity of the sample was 56.3% Hispanic/Latino and 43.8% non-Hispanic/Latino. In addition, the race percentages were as follows: 6.3% were American Indian/Alaska native, 12.5% were black/African American, 12.5% were native Hawaiian/other Pacific Islander, and 68.8% were white. Given that careers are an influential factor for stress levels employment status was measured. Specifically, 50% was part time, 50% was unemployed and no participants were full time.

Materials/Measures

Music samples. Two pieces of music were used in this study. The consonant music piece was Wolfgang Amadeus Mozart's Canzonetta Sull'Aria and the dissonant music piece was Aram Khachaturian's Toccata in E flat minor. The Mozart piece was selected as the consonant piece because, as per the composer's time period, music theory was considered symmetrical. Theory analysis of Mozart's piece shows that the piece harmonizes and follows a set of common chordal progressions, which makes the motive of the piece predictable. Listening alone, one can observe the steady tempo, rhythm and harmonic tones that are commonly pleasing to the ear. As compared to the consonant piece, Khachaturian's Toccata in E flat minor is the exact opposite. In other words, the piece is composed of different chordal harmonies with many unpredictable transitions. It exhibits dissonance through its use of major minor seventh chords and jumps that in combination create a diverse range of notes.

Stress inducing task. An arithmetic task was used to induce stress before listening to both music samples. The task was timed and consisted of 30 math problems containing long addition, subtraction, division, and multiplication.

Measure for stress levels. The State Trait Anxiety Inventory for Adults (STAIA; Spielberger, Gorsuch, & Lushene, 1970) was used to assess the emotional stress levels participants. For both conditions within the sample, participants completed the STAIA for each time point (i.e., time 1, time 2, and time 3). This self-reported questionnaire included 20 questions that assessed how the participants felt "at this moment". Participants responded to questions such as: "I feel calm" or "I feel strained", in which responses were rated from 1 (not at all) to 4 (very much so). Necessary items were reversed scored with higher overall scores on the STAIA representing higher stress levels in college students. See Appendix A for specific questions from STAIA, which were counterbalanced at each time point.

Procedure

Undergraduate college students at St. Mary's University and throughout the United States (e.g., in other McNair Scholar programs) were invited to participate in the study. Recruitment occurred via word of mouth and written advertisement solicited through email and thereafter snowball sampling occurred. The study was conducted online through Qualtrics. Participation was voluntary, and consents were also obtained electronically through Qualtrics. Subsequently, participants engaged in the following procedure. First, participants completed a demographics form, which included questions such as ethnicity, age, sex, and college classification. Next, participants completed the State Trait Anxiety Inventory for Adults (STAIA; Spielberger, Gorsuch, & Lushene, 1970), which assessed their stress levels at the moment and provided a baseline report on stress (i.e., Time 1). After reporting on their initial stress levels, participants completed a stress-inducing arithmetic task. Then participants listened to classical music either a consonant or dissonant music piece, with both music samples randomly presented to reduce order effects. Once done listening to the first music piece, participants completed the STAIA (i.e., Time 2) to assess their stress levels again after stress was induced. Next, participants completed a stress-inducing arithmetic task for a second time, and then listened to classical music, either consonant or dissonant – whichever was not first presented. Lastly, participants completed the STAIA (i.e., Time 3) to assess their stress levels after listening to the classical music. Upon finishing the entire procedure, participants were debriefed through a written description, which stated the purpose of the study.

Results

The following analyses explored the effects of classical music on stress levels as reported by college students.

Preliminary analyses

The initial reported stress level of the sample (Time 1) at baseline, as measured by STAIA, was 41 out of a possible score of 80 (SD = 12.527). After listening to the first music sample, the average stress level of students decreased to 37.69 (*SD* = 11.365) regardless of condition (i.e., listening to Khachaturian first or second). At the conclusion of this study, after listening to both music samples, the average stress level reported by students was 35.38 (*SD* = 10.046). Refer to Table 2 for the means and standard deviations of stress levels at each time point for both music conditions (i.e., Condition 1 = listening to Khachaturian first, Condition 2 = listening to Mozart first).

Primary Analyses

Below are the analyses of the results, which test the hypotheses of the current study.

Hypothesis 1. To explore if classical music significantly reduced stress levels in students, a one-sample *t*-test was conducted comparing scores on STAI at time 1 and time 3. Results revealed a significant difference in stress levels reported before listening to the music (i.e., time 1) compared to after listening to both music samples (i.e., time 3), $t(15) = 14.086$, $p < .001$. Specifically, stress levels decreased from time 1 ($M = 41$, $SD = 12.527$) to time 3 ($M = 35.38$, $SD = 10.046$) as reported on STAIA.

Hypothesis 2. To investigate if consonant music had a greater effect in reducing stress levels compared to dissonant music, independent-samples *t*-tests were conducted to examine stress levels reported at time 1, time 2, and time 3 on STAIA for each condition. Results revealed no significant differences in stress levels between each condition at time 1, $t(14) = .998$, $p = ns$. Additionally no significant differences in stress were found at time 2, $t(14) = 1.132$, $p = ns$. Lastly, no significant differences between each condition at time 3 were found, $t(14) = .387$, $p = ns$. Refer to Table 2 for means and standard deviations of stress levels reported at each time for both music conditions.

Discussion

The study's main objective was to identify which type of subliminal classical music theory could better reduce stress levels in college students. College students were selected for this study because previous research studied this population (Zentner, Grandjean, & Scherer, 2008; Egermann, Kopiez, & Reuter, 2007; Thoma et al., 2013, Sharma & Jagdev, 2012). College undergraduates tend to face stressful demands throughout their college career; therefore, this makes college students an appropriate population to measure stress. To date, research has reviewed emotional responses related to music listening and has used classical music to test their hypotheses. However, no study has examined classical music theoretically to explore which specific type can be more effective in healing through stress reduction. Even though most studies used classical music to test music's effects on stress, identifying which type of classical music can better reduce stress can be instrumental for music therapy research. As suggested in the study by Jiang, Zhou, Rickson, and Jiang (2013), not all music is appropriate for stress reduction. Therefore, this study examined two different types of classical music theory, consonance and dissonance (i.e., Mozart's Canzonetta Sull'Aria and Khachaturian's Toccata in E flat minor). To prevent order effects, the online survey had two music conditions (i.e., Condition 1 = Khachaturian first and Mozart last; Condition 2 = Mozart first and Khachaturian last) that were randomly administered to participants. The stress levels of participants were measured by the State Trait Anxiety Inventory for Adults (STAIA; Spielberger, Gorsuch, & Lushene, 1970), which was completed at three different time points within the online survey. Stress was also induced by an arithmetic task to aid in assessment of stress.

It was first hypothesized that classical music would significantly reduce stress levels, that after listening to both music samples (time 3), stress levels would decrease compared to stress levels at baseline (time 1). Secondly, it was hypothesized that the consonant music sample would have a more significant effect in reducing stress levels compared to the dissonant music sample. According to the results, the first hypothesis was supported given these data showed that there was a

significant decrease in stress levels. Results testing hypothesis 1 indicated differences in stress levels from reported baseline stress (time 1) to after listening to both of the music samples (time 3). The results showed that stress levels decreased from time 1 to time 3. Refer to Table 2.

Even with a relatively small sample (n = 16), a significant decrease in stress was observed from listening to classical music regardless of differences in music theory. This supports existing literature suggesting that classical music in music therapy research facilitates a stress-free emotional response (Trappe, 2012; Jiang, Zhou, Rickson, & Jiang, 2013; Mohammadi, Shahabi, & Panah, 2011; Sharma & Jagdev, 2012; Thoma et al., 2013; Bigand, Vieillard, Madurell, Marozeau, & Dacquet, 2005). Results testing hypothesis 2 (i.e., whether consonant music could significantly reduce stress more than dissonant music) showed that stress levels reported at time 1, time 2, and time 3 on STAIA did not significantly differ according to condition. In other words, the results did not reveal any significant differences in reported stress levels whether participants listened to consonant or dissonant music first.

There are several contributing factors to the second hypothesis not being confirmed. First, there was a limited amount of participants in this study. With a small sample size (n = 16), there is a lesser chance to observe significant differences. As mentioned earlier, even with a small size, the first hypothesis was supported suggesting that classical music can reduce stress. This supports the idea of musical healing from classical music and emphasizes the impact music can have on human emotion (e.g., stress). For example, music has successfully reduced reactivity and self-reported pain in a variety of settings (Chafin, Roy, Gerin, & Christenfeld, 2014). Additionally, music, as does language, has the ability to convey, express and influence emotions (Jiang, Zhou, Rickson, & Jiang, 2013). In summary other studies, including this one, showed that music positively influenced stress.

Among the strengths of this study, there are existing limitations. Firstly, this study occurred in an uncontrolled environment, where outside interference could affect participation. Given the survey was available to participants online, there are various intrusions that could have taken place during their completion of the survey (e.g., participants may not have been fully attentive, internet complications, noisy environments, etc.). Additionally, another limitation could be the brevity of listening to music samples during this study whereas, in contrast, participants in former studies often listened to music for longer time periods and across multiple days (Sharma & Jagdev, 2012; Mohammadi, Shahabi, & Panah, 2011; Tseng, Chen, & Lee, 2010; Zentner, Grandjean, & Scherer, 2008). Specifically within this study, the music samples ranged from 3 to 5 minutes in duration. Lastly, there is a methodological limitation concerning the music samples. Besides differing in chordal and harmonic structure, both music pieces differ immensely in tempo. In particular, Khachaturian consisted of a faster pace (i.e., transitions of rhythm) compared to Mozart. This is important because musical tempo can be a predictor for strength of influence (Bringham, Giesecke, Thorne, & Bringham, 2009). The music pieces selected for this study were primarily selected for their musical composition. If both music pieces had the same tempo, preferably matching a tempo similar to the heart rate while still maintaining their main characteristics of being either consonant or dissonant, perhaps the study might have

shown significant differences in stress reduction.

This study is important for both the music therapy field and effects of music on human emotional responses. Specifically, these findings uniquely highlight music as a tool of healing. This study supports the former finding that classical music is known to reduce stress. That is, more significant benefits on health were attributed from classical and mediation music whereas heavy metal or techno were ineffective toward health (Trappe, 2012). This is the first research project to examine which types of classical music theory are more effective in stress level reduction. Therefore, this project was necessary to better understand the healing possibilities of both consonant and dissonant music.

In conclusion, this study could expand through acknowledging the above limitations. For example, a different methodological approach could be employed (e.g., participants listening to longer music samples across a longer time span) to explore musical effects on stress. Given that this project used the State Trait Anxiety Inventory for Adults (STAIA; Spielberger, Gorsuch, & Lushene, 1970), which is an emotional psychological measurement, future studies could assess stress levels through physiological measurements. For example, heart rate could be measured, and this type of assessment could take place in a controlled laboratory. Instead of measuring stress levels in college students, future studies could examine the effects of consonant or dissonant music on stress levels in younger or older populations. In particular, there are multiple types of classical music genres that can be investigated in a way similar to this study. Specifically other studies could include music samples that entirely encompass music theory centralized around enharmonic melodies, quartile harmonies, whole tones, atonal and tonal, and pentatonic scales to just name a few. In its totality, this study has implications for the music therapy field by its investigation of examining which classical music theory better affects stress reduction.

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Table 1
Summary of the Impact of Music Therapy

Studies	Tseng, Chen, & Lee (2010)	Sharma & Jagdev (2012)	Jiang, Zhou, Rickson & Jiang (2013)	Thoma et al. (2013)
Sample	Postpartum Female	Adolescents (15-18yrs old)	Female	Female
Recruitment of participants	Hospital recruitment	Not mentioned	Bulletin board advertisements	University advertisements
Study design	Randomized clinical trial design	Intervention design	Not mentioned	Between study design
Tests/Instruments	The Perceived Stress Scale, SAI (State Anxiety Inventory)	Scale of Academic Stress from Bisht Battery of Stress Scale, Self-Esteem Inventory by Coopersmith	Mental Arithmetic Task (Zhou), SAI (State Anxiety Inventory), sub-scale State-Trait Anxiety Inventory, 4-point Likert Scale	TSST (Trier Social Stress Test), VAS (Visual Analog Scales), STAI (State and Trait Anxiety Inventory), LifeShirt System
Outcome of measurements	Music induced relaxation in postpartum women	Music Therapy proves significantly effective to enhance self-esteem	Listening to preferred music (whether stimulative or sedative) significantly reduces stress level	Music listening affects the autonomic nervous system

Table 2
Means and Standard Deviations of Stress Levels Reported by Students for Both Music Conditions

Conditions	STAIA Time 1 *M* (*SD*)	STAIA Time 2 *M* (*SD*)	STAIA Time 3 *M* (*SD*)
Music Condition 1	44.13 (15.73)	40.88 (12.47)	36.38 (12.11)
Music Condition 2	37.88 (8.15)	34.50 (9.90)	34.38 (8.21)
Total	41.00 (12.53)	37.69 (11.37)	35.38 (10.05)

Note. Music condition 1 = Khachaturian was heard first and Mozart was heard second. Music condition 2 = Mozart was heard first and Khachaturian was heard second. The total possible score in the STAIA at each time point was 80.

Appendix A

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name_____Date_____S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

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STAIP-AD Test Form Y
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The Performativity of Gender Present in Virginia Woolf's Works

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Abstract: *In the novel, **Mrs. Dalloway** (1925) and the essay, "Thoughts on Peace in an Air Raid" (1941), Virginia Woolf (1882-1941) subverts the patriarchy of the public and the patriarchy of the private by galvanizing English society to question their complicity in maintaining it. This work of fiction and non-fiction, I posit, are both produced as anti-war statements which were influenced by personal tragedy and her observations of the effects that these patriarchies had on fellow English citizens. Mrs. Dalloway was written in the aftermath of World War I (WWI); whereas, "Thoughts on Peace" (1940) was written as World War II (WWII) was in its beginning stages. By employing Judith Butler's theory of performativity, I examine evidence from both texts to analyze how Woolf creates and challenges the performance of gender in relation to these patriarchies as related to war. To supplement Butler's theory, I also employ Michel Foucault's construct of power, Jacques Lacan's concept of the mirror stage, and Jacque Derrida's idea of language as the basis for reality. By using Butler's theory to analyze these patriarchies, readers glimpse the insidious hand that power hierarchies of society have on privileged binaries such as male over female, logic over emotion, or heterosexual over homosexual. These privileged binaries are legitimized through the public sphere and institutions ruled by men, but carried out often by women who become subsumed under the established rules. In a broader scope, such patriarchal tyranny not only objectifies women as its domestic 'Other' but also objectifies militaries, foreign and domestic, as the 'Other' by the nation-state/government.*

Contemporary Struggles: Gender and Power Hierarchies

This essay's focus is on how the power of the patriarchy of the public and the patriarchy of the private is performed through gender in Woolf's "Thoughts on Peace in an Air Raid" and in *Mrs. Dalloway,* when analyzed through Butler's theory of gender performativity. When Butler's approach is employed as a means of analysis however, it becomes difficult to name her as the sole instrument of examination, especially as her own theories rely on several other thinkers/philosophers, such as Jacques Derrida and Michel Foucault. Therefore, Derrida's method of deconstructive close reading (Palmer), as well as Foucault's approach to power (McNay), are additions that enhance the clarity of using Butler's theory to understand the convergence of sex, gender, war, and power, in Woolf. The impact of this convergence on history and our modern day world are part of worldwide cultural experience.

Given our embodiment as human beings, we enact a gender, a sex, a nationality, a certain set of beliefs as we become socialized. Woolf addresses the

hand social constructivism has in enacting gender, sex, and their relation to what constitutes our ideas of personal identity, in both of these works. She demands we question and reform ideology so that men, women, homosexuals, heterosexuals, and all people obtain and share the same rights and liberties. Culture and power as we know it are both influenced by the individuals who are subject to the power hierarchies they are born into (whether they be regional, national, ethnocentric, clan/tribal, etc.), but are also capable of molding said power/culture. To clarify the difference of public patriarchy and private patriarchy, it is appropriate to think of it as the difference between the domestic home and the public domain. This public domain refers to institutions such as colleges, universities, education, the Church (religion), law, medicine, science, economics, and to everything that lies outside our front door. This public domain works together with the private one of the home to promote certain cultural and social expectations and norms. Our primary means of meaning-making usually begins within the family unit which is synonymous with the private patriarchy.

Woolf, Butler, Foucault, and Derrida are all deeply concerned with power and the disempowered which at the fundamental level is enforced or questioned by a family unit within a society. Who gets what and why? Who are the oppressed and who possesses authority? How do groups and individuals come to occupy these positions and how do these relationships change? Why or how do power hierarchies differ? Often when gender/sex/sexuality enter the picture there is a clear demarcation of a superior and inferior position related to identity as defined through a binary opposition. Although Woolf was posing these questions in the early twentieth century, there continues to be clear examples and atrocities that reveal gender and power imbalances in the early twenty-first century.

One recent case involved the murder of a young 25-year-old pregnant Pakistani woman, Farzana Parveen, who was stoned to death by her father, cousin, and her brother Zahid in front of Lahore High Court. Farzana's family had arranged her marriage to a cousin, even though she had decided to marry Muhammad Iqbal; consequently her family filed a judicial complaint with police claiming that Iqbal had coerced her into the betrothal. While on her way to court to testify, some men, including her own relatives, surrounded and attacked her with bricks. It was cold murder in broad daylight enacted this past May. But the gruesome tale does not end there. Apparently Mr. Iqbal had murdered his first wife, Ayesha, so that he could wed Ms. Parveen. Although he had been detained for his crime in April 2013, his and Ayesha's son legally pardoned him thus setting him free (Walsh).

This is not the only "honor killing" that has occurred in Pakistan. There are countless other horrors of women being punished by their families, in some cases murdered by them; yet it is seen as a private family matter by the court, the police, and the law. Another permissible act of violence occurred in India. Two cousins, both girls, aged fifteen and fourteen were gang raped and then hung by scarves from a mango tree. Their killers might get away with impunity as the rapists were from the Yadav caste and the girls were from the Dalit or "untouchables" caste. In the village of Katra Sadatgunj, where the crime took place, the state government and the village police are ruled by Yadavs, the majority group. Dalits are usually landless laborers (Burke).

Violence and sexual abuse are rampant, often going unpunished in Occidental nations and elsewhere. "However, since 2012 rape has been condemned as a capital offense in India, as a

response to the gang rape of a 23-year old young lady from Delhi. In response to this injunction, Mulayam Singh Yadav, a politician in Uttar Pradesh said this law was too severe because "boys will be boys" and are prone to messing up" (Burke 3). It is chilling and repugnant that "boys will be boys" is a legitimate excuse to rape, maim, and kill as though all men were inherently born to commit such heinous offenses. These examples demonstrate the need for us to continue to ask the questions that Woolf addresses concerning the deleterious effects of violence rooted in the socially created patriarchal inequality between women and men.

War, Tragedy, and Inspiration

Virginia Woolf (1882-1941) was an eminent female writer and essayist. She knew firsthand the limitations her gender suffered on multiple levels. Coming from a male-dominated household—which included her father Leslie, her mother Julia, her older siblings Stella, Gerald, George, Vanessa, Thoby, and a younger brother called Adrian—she lived at a time when propriety and manners were highly valued, especially in women. Through her parents' marriage she witnessed her mother, Julia tolerate her father, Leslie Stephen's emotional histrionics and endless demands for attention and praise. When Julia died an early death all of Leslie's children withdrew from him emotionally, begrudging him his incessant bursts of emotional neediness which were an imposition on Julia.

While growing up, Woolf once claimed that Leslie was her favorite parent. But that assertion became more ambiguous over time. She was indebted to him, as he was her primary teacher, the first person to encourage her writing and stimulate her thinking. They shared poetry and discussions of history. Leslie lent Virginia the entirety of his library collection which was her means of self-pedagogy since few British women ever went to college or were even admitted to one. Regardless of his behavior as father and husband—he was lacking, after all—he was an educated writer, editor, a man of letters. Virginia's father stimulated her intellect and passion for literature.

Woolf's literature regarding war, sex/gender, and fulmination of the power hierarchies that instituted the inequalities between genders was largely from her own life. "Bazin and Lauter reframe Woolf as a "war novelist" and detect the roots of her sensitivity to war in the early deaths of deeply loved family members…they further connect this sensitivity to violence and suffering with the abuse Woolf suffered at the hands of her half-brothers [Gerald and George Duckworth] and with her experience of growing up in a patriarchal household dominated by male egotism" (Hussey 4-5).

Woolf's work of fiction, *Mrs. Dalloway*, was published in 1925, shortly after the end of World War I. Although there seems to be no family members who served in this war, she commiserated deeply with those who lost a loved one during battle. "She had lost her mother, Julia Duckworth Stephen, in 1895, her half-sister Stella (who for two years had assumed the role of her mother) in 1897, her father, Leslie Stephen, in 1904, and her brother Thoby in 1906. These painful events made her identify in a personal way with the families and friends of those who died in the wars" (Hussey 14-5). The pain of losing her mother, when she was thirteen, provoked a mental breakdown; she subsequently battled with mental illness through the rest of her life. In 1940 she wrote a non-fiction essay "Thoughts on Peace in an Air Raid", a piece that was a personal discourse of the fear of living through the German air raids on London. Virginia and her husband Leonard, were lucky to have lived through these air raids,

now dubbed the Blitz, which killed a large number of people while devastating London. Virginia feared the bloodshed and certain deaths World War II would bring about. She wanted women and men to reflect on their personal power to veer away from the foundational beliefs and ideas that made war and sexism possible.

Woolf's Protagonists in *Mrs. Dalloway*

Mrs. Dalloway (1925) centers around two characters: Clarissa Dalloway and Septimus Warren Smith. Clarissa is a society lady who is throwing a party in London on a fine summer day in June.

> "To be specific, the culminating event toward which the novel tends from its first sentence onward is to be a single, very English party, given on the evening of the day in which the novel is set, by the titular character, a well-born Englishwoman in her fifties and her husband, a well-connected government functionary. The house is in the fashionable West End, amidst enclosures of fine dwellings and private squares, of great parks and royal palaces, abutting Whitehall, the traditional seat of government and public ceremony. In keeping with the postwar mood a small, ancient island culture that has lost nearly a million of its young men, one in ten of its eligible males, to death, with another 2 million maimed, mutilated, disabled, or otherwise wounded, mentally or physically, the gathering, even nearly five years after the armistice, is to be somber, select, sedate, in keeping with traditional upper-class social rituals and observances" (Beidler 5).

The stream-of-consciousness technique Woolf employs in her fiction allows us to observe these social rituals and observances through the actions of the characters including Clarissa and Septimus. Woolf allows us to step into Clarissa's thoughts as she bustles around the house giving orders to servants, or mends her dress. By allowing us to hear the murmurs of her consciousness, we can empathize with her. "The subtly nuanced subjectivity embodied in Woolf's fiction holds out a hope of agency that seems daily more remote in the totalitarian world of mass culture, advertising, and news media" (Hussey 8). This subjectivity is only possible through crossing from our consciousness to the characters' in such a way that we hear their deepest thoughts. Despite the cheer and charm she seems to exude, we find that Mrs. Dalloway feels decrepit and frail due to the effects of Spanish Influenza, that she feels distant from her own daughter Elizabeth, and that she married Richard because he was stable, a man of political and economic stature.

Although Clarissa, or any of the other characters, are not overwhelmed by the variety of media and distractions we hear today, she nevertheless walks about a city, which is crowded and bustling with taxis, cars, and omnibuses. The buzz of the airplanes is overhead. The world is now; it appears over-run by technology and machines. But it is intermingled with parks, statues, dress shops, palaces, and gardens. London city through Clarissa's eyes and the rest of the eyes (of the different characters) allow us to glimpse a world of change and distractions, which are only a hint of the cacophony we live in today.

The breach of mental boundaries, that characterizes stream-consciousness literature, means that we hear Clarissa's reflections and emotions running through *Mrs. Dalloway*; this includes the disappointment of not allowing herself to marry Peter Walsh, a quixotic, clever man, who was too unconventional, too

unconcerned with propriety and social status, for her to marry. Flipping through her memories, we also witness Clarissa's pleasure at the kiss she shared with her friend Sally Seton, a rebellious, spunky girl who was her crush as an adolescent. Yet any opportunity of romance between the two is snuffed out as society would have disapproved, as well as Clarissa's father, of a lesbian relationship. Sticking to the rules and social conventions of patriarchal Britain was already entrenched deep within her. As she runs into her old childhood friend, Hugh Whitbread, in preparation for the party, we glimpse the panoply of all English customs in him. He is a court functionary, well-dressed, proud of his post which allows him to brush elbows with royalty. But it seems he is all superficiality: the right words, the right manners, and the proper attire. Yet the real desires and thoughts of Hugh are obscured from view, both from the reader and from Mrs. Dalloway.

This spurious nature seems to be present in most of the characters as we watch them present one face to the world, composed and carefully arranged to adhere to convention and the codes of behavior, while inside they hide dissent, anger, or other negative reactions, curbing their true emotions or thoughts. Clarissa reflects on her life trying to measure its worth, the legacy she is leaving behind, and feels that it is deficient. The life of a society lady is missing something: attending parties, hosting lovely dinners, accompanying her husband, and looking after children, wearing beautiful dresses, all this was not enough. Clarissa thinks of herself, "this body, with all its capacities, seemed nothing—nothing at all. She had the oddest sense of being herself invisible, unseen; unknown; there being no more marrying, no more having of children now, but only this astonishing and rather solemn progress with the rest of them, up Bond Street, this being Mrs. Dalloway; not even Clarissa any more; this being Mrs. Richard Dalloway" (*Mrs. Dalloway* 9). Sharing in this sense of despair, of a life circumscribed by his gender and society, is Septimus Warren Smith.

Septimus, one of the few working class characters—as the novel is so heavily focused on etiquette, convention, socio-political status of polite society—is a returning veteran stricken by shell-shock, or what is called today Post Traumatic Stress Disorder (PTSD). Given the limited information and psychotherapeutic methods of the time, it was thought to require bed-rest to recover from it. Bouts of recurrent hallucinations, hearing voices, seeing the ghost of his dead comrade, Evans, haunt Septimus. His Italian wife, Rezia, is unable to empathize with his illness, especially after consulting a psychologist (the inept Dr. Holmes) who says nothing is wrong with him. Holmes prescribes plenty of rest and encourages Septimus to take up a hobby to de-stress. Rezia is a concomitant victim of the war as she watches her husband succumb to this unknown, obscure illness, whose roots she does not comprehend, "He [Septimus] is selfish. So men are. For he was not ill. Dr. Holmes said there was nothing the matter with him" (*Mrs. Dalloway* 23).

Physically, Septimus seems well; but inside he is broken, finding it hard to communicate his experience. "Indeed, such "hysterical men," as they were called with their loss of nervous control, tics, tremors, outbursts, and frenzied motions, had continued to appear in such numbers in the years after the war…The official attitude of the government and military mandarins continued to pigeonhole shellshock as a somewhat embarrassing failure of masculinity: some men can take it, and some small percentage cannot" (Beidler 9). Readers move from these two individuals to others who also have the bitter aftertaste of

the war lingering in their thoughts and actions.

By giving us a glimpse of the psychological consciousness of a nation struck by war, and of the individuals themselves, Woolf manifests a grim picture: that even after the battle is over, the scars remain and peace is mythical. “Poole sees Woolf’s fiction of the 1920s and 1930s as an onslaught on the “official version” of war, her Modernist experimentation being a unique appropriation of the public voice of “they” that occludes the subjective reality of individual experience in favor of “democratic objectivity” (Hussey 7). Patriarchal fascism seeks to impose one voice, one mindset, and silences any challenges to the established power norms in place. Women and men are trapped by the fascism of the nation (Britain) who wields soldiers, men, and women as objects to carry out its orders, its rules of what is right, wrong, just, and/or necessary.

The female characters in the novel depict the shortcomings of a life in which they are granted almost no rights: no education, no socio-economic opportunities. By the 1920s, English women had been given the vote but there are no women in positions of power or who were running for such positions. Concurrently, the men are also circumscribed by the hegemony of their era, and their nation. Septimus (a metonym of patriarchal men and sick veterans) is consumed by guilt when he feels nothing after Evans dies and also by the implication that they might have been more than friends. The blood bath he has been subjected to and the social taboos of homosexuality cause him enormous remorse and pain to the extreme. Getting rid of the burden only seems possible through suicide, which he successfully commits, just as Dr. Bradshaw is about to send him to another mental facility.

Just as *Mrs. Dalloway* seeks to destabilize the fascism of the public/private patriarchal structure through the Modernist stylistic method of stream-of consciousness “Thoughts on Peace in an Air Raid” also challenges this structure, delivering a pacifist vision, through the direct voice of an essay in which Woolf hopes men and women will achieve someday the peace that eludes them as WW II deploys men back to arms. “It must be noted that ‘order; and ‘disorder’, ‘structure’ and ‘anti-structure’ can only be dialectically related, for Turner points out that ‘life is a type of dialectical process that involves successive experience’ of ‘high and low’, ‘homogeneity and differentiation’” (Wing-chi Ki 427). By going against traditional ways of story-telling in *Mrs. Dalloway,* Woolf turns away from the careful structure of past novels which have a linear, objective bearing. Her methods take us into the bodies, perceptions, and thoughts of her characters allowing us to see firsthand the damage patriarchal fascism exerts on soldiers and on women, where women are subject to the tyranny of men and the soldier is a pawn of the nation-state.

Essentially Woolf is giving pain, disease, anger, and fear a voice, a face, and a name through the various characters (Hugh, Clarissa, Sally, Peter Walsh, Richard, Elizabeth who is Clarissa’s daughter, Septimus, Rezia, Dr. Bradshaw, Dr. Holmes, Miss Kilman, etc.); these voices and sentiments will never be delivered or admitted by those in power (namely men who are politicians, legislators, and members of other professions who enjoy the benefits of being an authority or “superior”). Woolf’s anti-structure in terms of delivery also invalidates the “order” that Turner refers to, an order brought about by convention and through the carefully defined oppositions of male/female, man/woman, heterosexual/homosexual, and sane/mentally unstable among others.

Yet Woolf reveals that none of these binary oppositions are clear cut categories. The sane have insanity about them and the insane also have touches of truth they dispel. Men can display feminine qualities or have an attraction that belongs to women (or so British culture posits), and vice versa. These rules, expectations, and taboos are socially constructed.

> Gender theorists argue the contingency of gender—that we could in reality be anything we wish to be in regard to sexuality or gender identity because nothing is naturally mandatory—inspires panic in people whose sense of identity is inseparable from the sanctity of the reigning heterosexual gender norm. At the heart of heterosexual culture' antipathy to gays is a panic fear that heterosexuality is not in fact normative. Indeed, if heterosexuality and homosexuality are on a fluid continuum of diverse possibilities, none more normative or central than the next, then homosexuality is less an 'other' that is outside heterosexuality than an 'alter' that is one alternative along with heterosexuality in a range of diverse and equally weighted possibilities (Ryan 135).

Individuals who reveal or rebuke the established conventions or rules fill the majority with disgust or shock because it goes against "nature" when in fact this nature was a myth engendered by a society's conventions. It is created by human institutions, human conditioning, through education, and so on.

"Thoughts on Peace in an Air Raid" and WW II

Continuing with this theme of social shaping of individuals, Woolf wrote "Thoughts on Peace in an Air Raid" in 1940 during WW II, as a presentation she delivered for an American symposium. Therefore the tone is direct, delivered in direct address, in her own voice, filled with her thoughts and her horror of the air raids and imminent fear of being wiped out by a bomb. "One, two, three, four, five, six…the seconds pass. The bomb did not fall. But during those seconds of suspense all thinking stopped. All feeling save one dull dread, ceased" ("Thoughts on Peace" 3). But her fear pertains not just to her life but to the ideas, institutions, and beliefs that culture propagates and allows for such a horror to take place. What can justify bloodshed? According to Woolf, the reason lives are being sacrificed is that "they [politicians] tell us that we are a free people, fighting to defend freedom. That is the current that has whirled the young airman up into the sky…We are both prisoners tonight—he boxed up in his machine with a gun handy; we lying in the dark with a gas-mask handy" (Ibid 2).

Virginia Woolf was asking women to realize that the institutions of war, of patriarchy, the notion of certain sexualities as acceptable and non-acceptable [as Mrs. Dalloway covertly critiques], and so on, were accomplished as Hennesy postulates in *Materialist Feminism and the Politics of Discourse*:

> [Through] a theory of ideology [that] makes it possible to explain the complex ways social reality is shaped—through the overdetermined relations among mechanisms for making sense, distributing resources, dividing labor, and sharing or wielding power…The causal logic underlying a theory of discourse as ideology makes it possible to acknowledge the systematic operation of social totalities like patriarchy and racism across a range of interrelated material practices.

> These totalities traverse and define many areas of the social formation—divisions of labor, dimensions of state intervention and civil rights, the mobility of sites for production and consumption, the reimagination of colonial conquest, and the colonization of the imagination (xvi-xvii).

The social realities of national fascism and patriarchal fascism, which start from the seeds of ideas, shape and distribute resources, power, and labor unequally. Woolf's awareness of the national/patriarchal fascism is revealed by her statement, "All the idea-makers who are in a position to make ideas effective are men. That is a thought that damps thinking, and encourages irresponsibility…Are we not stressing our disability because our ability exposes us perhaps to abuse, perhaps to contempt?" ("Thoughts on Peace" 1). Woolf knows power to be in the hands of men as they are running government; their majority decrees the law, and they are encouraged to earn a degree, to obtain an education. Only men are accepted into the clergy; there is no such thing as a woman priest. The list of power imbalances is ceaseless (Woolf 1938). Those who question or defy the established order, are as Woolf says, opening themselves to derision. The word "feminist" still produces negative reactions in people; it is a term that has become confused with misandry and with self-righteousness and other adverse labels.

At the beginning of her "Thoughts on Peace", Woolf asserts that because women are not allowed to participate in combat they must find another way to support their country. "How far can she fight for freedom without firearms? By making arms, or clothes or food" ("Thoughts on Peace" 1). Clearly, the divisions of labor to which Hennessy refers to are gendered and Woolf discloses this when she makes this statement. Sewing, knitting, cooking, working in factories to build weapons and other war necessities were tasks which women were allowed to take on because they were 'feminine' enough.

Even today we find fewer women than men in the fields of science and mathematics. The number of male architects, engineers, and such, outnumber women. But why were women's options so limited? First, one might argue, women usually cannot match a man in physical strength. This might be so, but why not have women participate in parliament, in the stock exchange, in the clergy, or in the cabinet? Those were questions which Woolf also wanted an answer to. Why not allow them to also lead their country; perhaps they might have useful ideas on how to prevent war?

Women could not participate in the public sphere as they were not allowed to obtain an education. Even in colleges/universities where women were admitted they would sometimes graduate but were denied a degree (Woolf 1938). This, of course, posed a dilemma and a disadvantage in the work force, significantly reducing one's chances of finding employment. What other option besides marriage would allow for her sustenance? How could women lead a nation if she did not have the appropriate title and degree/education? Woolf decries what she views as an injustice, but finds at the root of the problem not men per se, but the ideology of men (and women too). These ideals are plagued with "Aggressiveness, tyranny, the insane love of power" ("Thoughts on Peace 2). The distribution of power between males and females is skewed but why would men want that to change when they are enjoying a greater share? It might seem so but as she pronounces within "Thoughts": "Therefore if we are to compensate the young man for the loss of his glory and of his gun, we must give him

access to the creative feelings…We must free him from the machine. We must bring him out of his prison into the open air" (3).

It is not easy to question the established power hierarchies, at a national or domestic level, not only because those who query are seen as a threat or nuisance, but also because "There is…no such thing as the 'natural' or 'pre-social body'; it is impossible to know the body outside of the meaning of its cultural significations" (McNay 38). What does this imply? The cultural significations means that women do not know or cannot know themselves outside of their present reality. British women of the early 20th century must struggle to question what femininity is, what maleness is, how and why gender impacts the distribution of power. They must ask, also, how this influences their place in society and their personal identity. It is impossible to answer these questions from an objective place, however. We [all human beings] are all born into a system, a power hierarchy, a culture that has its guidelines and beliefs; we cannot decide to walk away from the roles we were handed. But that does not mean that we cannot change them. Woolf implies this when she states, "Mental fight means thinking against the current, not with it" ("Thoughts on Peace" 1). There will be friction. There will be dissent, but it is compulsory if war is to be erased forever, and if women want to receive the equal power and liberties of their male counterparts.

Performativity of Gender

To grasp what Judith Butler posits of sexuality, the sex/gender binary, and power structures, we can conflate it with a theatrical performance. According to Butler, we act out our gender and sex in agreement with the script (social conventions) we are given by our culture. Mainly it is a script that remains unchanged; we are all forced to repeat the same lines, anyone who changes it risks being shunned, ridiculed, or punished. Thus this enforces a coercion to stick to the role one has been thrust into. That role is circumscribed by one's sex, but which is also linked to a series of other factors such as: class, race, religion, age, disabilities, etc. As Butler states:

> According to the understanding of identification as an enacted fantasy or incorporation, however, it is clear that coherence is desired, wished for, idealized, and that this idealization is an effect of a corporeal signification. In other words, acts, gestures, and desire produce the effect of an internal core or substance, but produce this on the surface of the body, through the play of signifying absences that suggest, but never reveal, the organizing principle of identity as a cause. Such acts, gestures, enactments, generally construed, are performative in the sense that the essence or identity that they otherwise purport to express are fabrications manufactured and sustained through corporeal signs and other discursive means. That the gendered body is performative suggests that it has no ontological status apart from the various acts which constitute its reality (136).

Miller supports this performative idea of identity, stating, "'Performativity' it now appears, means, among other things, the assumption that human beings have no innate selfhood or subjectivity but become what they are through more or less forced repetition of a certain role" (225).

In application to Woolf's texts, this seems most glaringly evident in Woolf's fiction. Clarissa Dalloway and Septimus Warren Smith both have 'deviant' sexualities that run opposite of the hegemony of patriarchal British society, but

were aware of the risk they ran of alienating others if they knew. Thus Septimus "had married his wife [Lucrezia] without loving her; had lied to her; seduced her; outraged Miss Isabel Pole, and was so pocked and marked with vice that women shuddered in the street" (*Mrs. Dalloway* 98). Clarissa married Richard for stability and socio-political standing, but she seems to be a closeted bisexual. She does not love Richard but she loved Sally Seton and Peter Walsh passionately. Both of these protagonists are portrayals of a sexuality that is 'abnormal' and therefore their performance of their sex and gender is inauthentic. "For people of color living in Africa or in the Americas, Native Americans, females, gays and lesbians, and a host of others, the traditional answer has already been articulated by the dominant class and its accompanying hegemony: silence. Live quietly, work quietly, think quietly. The message sent to these "Others" by the dominant culture has been clear and consistent—conform and be quiet; deny yourself, and all will be well" (Bressler 234).

This erasure, denial of the self, is posed through most, if not all, the characters in Woolf's *Mrs. Dalloway*. The interactions among Dr. Bradshaw, Rezia, and Septimus are a metonym of how dominant culture inflicts its expectations on the 'Other'. Due to his medical authority and title Dr. Bradshaw is bestowed the power to impose his prescriptions and will onto Septimus. In *Mrs. Dalloway,* Bradshaw diagnoses Septimus as a severe case of shell-shock but his remedy is that Septimus be sequestered to a home, a mental facility out in the country, where he will be getting mandatory bed-rest. The authority of Bradshaw allows him to impose his will on the ill, even though bed-rest was hardly the solution to PTSD. Bradshaw is an embodiment of the logic within the logic/emotion binary—Woolf's representation of British culture values logic over emotion—which allows Bradshaw to impact the lives of Rezia and Septimus. But with our current knowledge of PTSD and its treatment we know that bed-rest was inadequate and that authority and those in power do not always make the best choices even when these seem to be informed by "reason or logic":

> Proportion has a sister, less smiling, more formidable, a Goddess even now engaged—in the heat and sands of India, the mud and swamp of Africa, the purlieus of London, wherever in short the climate or the devil tempts men to fall from true belief which is her own—is even now engaged is dashing down shrines, smashing idols, and setting up in their place her own stern countenance. Conversion is her name and she feasts on the will of the weakly, loving to impress, to impose, adoring her own features stamped on the face of the populace…This lady too (Rezia Warren Smith divined it) had her dwelling in Sir William's heart, though concealed, as she mostly is, under some plausible disguise; some venerable name; love, duty, self-sacrifice…But conversion, fastidious Goddess, loves blood better than brick, and feasts most subtly on the human will. For example, Lady Bradshaw. Fifteen years ago she had gone under. It was nothing you could put your finger on; there had been no scene, no snap; only the slow sinking, water-logged, of her will into his (Woolf 108-9).

Septimus struggles articulating his troubled state of mind. The guilt of his romantic feelings for Evans, his participation in the mass murder of other human beings, marrying Rezia without loving her, all disturb him to the point where he would rather end his life. "The binary

relation between culture and nature promotes a relationship of hierarchy in which culture freely 'imposes' meaning on nature, and hence, renders it into an 'Other' to be appropriated to its own limitless uses, safeguarding the ideality of the signifier and the structure of signification on the model of domination" (Butler 37). What Butler is positing is that notions of power (patriarchy), sexuality, gender, etc. are all constructed by the English society and then taught and inculcated into its citizens as being natural impulses that form them into proper English men and women. Septimus, Clarissa, and other minorities feel a sense of pretending to be something they are not; the performance of their gender has been complicated by their homosexual feelings. They feel themselves to be insincere, fake, a copy of what society has asked them to be, but there is no reward for obedience, only the sense that something is missing.

How does the patriarchy of the public and private in Woolf's fiction and non-fiction gain the traction that it does? The roots these ideas have in a culture are so potent that men are willing to die for them, literally. "The rules that govern intelligible identity, i.e., that enable and restrict the intelligible assertion of an 'I,' rules that are partially structured along matrices of gender hierarchy and compulsory heterosexuality, operate through *repetition.* Indeed, when the subject is said to be constituted, that means simply that the subject is a consequence of certain rule-governed discourses that govern the intelligible invocation of identity" (Butler 145). Therefore the power of patriarchy lies unchecked because, namely women, but also men, are not challenging the hegemony and taking control of their identity and individuation. This framework of sexuality and power are concomitant forces that bring personal torment and confusion to Septimus and Clarissa, seeing as how, from the view of the theory of performativity, they are within their right to amend the script they have been handed. Such is the case with the women of India and Pakistan as well, who are victims of an ideology that does not allow for them to be considered intelligent, equally valuable beings, in comparison to men. "Foucault argues that sexuality is always situated within matrices of power, that it is always produced or constructed within specific historical practices, both discursive and institutional, and that recourse to a sexuality before the law is an illusory and complicitous conceit of emancipatory sexual politic/s" (Butler 97).

Men and women of all countries should, Woolf asserts, reflect on the different binaries that are valued in their culture and how it affects them. What is legitimated and why, who does it benefit, who does it leave unprotected? "The idea that women are inferior to men is naturalized and, thus, legitimized by reference to biology. This is achieved through a twofold movement in which, firstly, women's bodies are marked as inferior by being compared with men's bodies, according to male standards (homme manqué) and, secondly, biological functions are conflated with social characteristics. In many respects, masculine characteristics can be seen to be related to dominant perceptions of the male body, i.e. firmness, aggression, strength. However, man, unlike woman, is understood as being able to transcend being defined in terms of his biological capacities via the use of his rational faculties" (McNay 17).

Even in American society, in the 21st century, this belief still affects our perceptions of others and ourselves. Why else would women, especially married women be asked: When are you having children? Constantly what is expected, even demanded of women, is reduced to our physical bodies and its capacities. Men, too,

are often asked to hold themselves accountable to certain codes of conduct or standards based on their physiology. For example, let us think of the way the ideal male is represented in popular media: someone muscular, handsome, tall, strong, and self-assured. If a man is small, thin, delicate he often finds himself feeling inferior next to the 'ideal male'.

The association of maleness in most Western cultures with reason and logic also affects our judgment of what is validated as knowledge and truth. "To schematize, the post-structuralist argument holds that the notion of a rational, self-reflective subject, which has dominated Western though since the Enlightenment, is based on the displacement and/or derogation of its 'other'. Thus the notion of rationality is privileged over the emotions, spirituality over the material, the objective over the subjective…This dualism privileges an abstract, pre-discursive subject at the centre of thought and, accordingly, derogates the body as the site of all that is understood to be opposed to the spirit and rational thought, such as the emotions, passions, needs" (McNay12-13). The undesirable characteristics: overtly emotional, passionate, and needy/delicate are pushed onto women because their biological difference allows for this figment to become validated.

It follows that as women were meant to be mothers because of their reproductive bodies, nurturers by "nature", they should be in charge of rearing children and of keeping the household in order. Viewing biology and science as 'truths', patriarchy is used as a construct that legitimatizes that men should take on the role of 'breadwinner' to provide for his family with his brains and brawn. Meanwhile the woman should remain at home because she is too delicate for any public work, or onerous task. She is reduced to her bodily capacities, and the nature that is bestowed to her as a nurturing, caring, emotional woman. This is not always the case, in many societies, but it is an instance that reiterates itself in many regions. The women of Pakistan and India are such examples. Many women are not free to obtain an education, or any type of self-autonomous agency. They almost never gain the status of an equal [to men] in the eyes of the law and the public realm. Often those who seek education do it in secrecy for fear of reprisal or of becoming the target of violence. To grant women an education, is to go against nature [of gender/sex] itself, in some aspects Occidental and other societies.

Through her subjective reality of the individual when faced with conflicting personal desires that rebel against those of the hegemony of the public/private patriarchy, Woolf subverts the codes/conventions that restrict men and women. Societal mores rob them of the freedom to be themselves. How does patriarchal England win when its soldiers return home so mentally battered they want to end their lives? How does any society win when its subjects are performing and acting out a role that enslaves them, that forces them to act out a false, inauthentic character that leaves the actor feeling despondent and discontented—such as Clarissa Dalloway, Septimus, and minor characters in her fiction—offering no prize or consolation to those who obey the expectations that society/power demands of them.

A moment in which we see Clarissa Dalloway glimpse the mirage of the role social constructivism has in shaping her enactment of herself as a heterosexual, upper-middle class woman and mother, of fifty-two, is when she contemplates her reflection in a mirror:

> She pursed her lips when she looked in the glass. It was to give her face point. That was her self—pointed; dartlike; definite. That was her self

> when some effort, some call on her to be her self, drew the parts together; she alone knew how different, how incompatible and composed so for the world only into one centre, one diamond, on woman who sat in her drawing-room and made a meeting-point, a radiancy no doubt in some dull lives, a refuge for the lonely to come to, perhaps; she had helped young people, who were grateful to her; had tried to be the same always, never showing a sign of all the other sides of her—faults, jealousies, vanities, suspicions, like this of Lady Bruton not asking her to lunch; which, she thought (combing her hair finally), is utterly base!" (38-39).

In this instance, Clarissa recognizes herself as a construct of the role patriarchal England stamped on her, even as she catches a glimpse her true nature, beneath the fiction that has affected her performance of who she is. Basically Clarissa has been playing the character that she be commanded to play (which are limited by her class, gender/sex, and even her physicality or lack of health) and sees that internally she (her feelings/thoughts) cannot conform to those norms because they are not natural. As "Simone de Beauvoir suggests in *The Second Sex* that 'one is not born a woman, but, rather, becomes one'" (Butler 8).

The mirror also connects this moment in the text with Lacan's "Mirror Stage"; this is a stage in which the child begins developing its sense of individuation. "The mirror stage corresponds to this demand in so far as the child misrecognizes in its mirror image a stable, coherent, whole self, which, however, does not correspond to the real child (and is therefore, impossible to realize). The image is a fantasy, one that the child set up in order to compensate for it sense of lack or loss, what Lacan terms an "Ideal-I" or "ideal ego"…What must be remembered is that for Lacan this imaginary realm continues to exert its influence throughout the life of the adult" (Felluga).

As Lacan's imaginary realm exerts influence throughout one's life, so, too, do societal conventions. Another supporter of the notion that identity and knowledge are shaped by one's society is Jacques Derrida. Derrida was concerned with language as the primary means of communicating the ideology and values of the culture we are born into. "Believing that objective reality can be created by language, many post-modernists posit that all reality is a social construct. From this point of view, no single or primary objective reality exists; instead, many realities exist. In disavowing a universal, objective reality, these critics assert that reality is perspectival, with each individual creating his or her subjective understanding of the nature of reality itself" (Bressler 234). For clarification purposes, this is Bressler's take on Derrida. This is short-sighted though, in that Derrida did not assert the influence said society/language has on an individual not just through language but also through corporeal punishments or admonishments that exist to have the bodies of a society, conform to its ideals. To assert this notion we only need to refer back to "Thoughts on Peace in an Air Raid", *Mrs. Dalloway*, and Foucault's idea of power and its effects on the individual/body.

Conclusions

The performance of men as warriors, who are required to be aggressive, in order to defend the ideals of the nation-state, dehumanizes them. Metaphorically, they are expendable pawns of the government and men in positions of leadership, which are sacrificed for the 'honor of their country'. "The signifying function of war transforms death, war's product, into a meaning-making

practice. Wounding, too, is a practice that serves to substantiate abstract concepts…Will the injured soldiers who are used by the British media to rouse patriotic sentiment 'be grinding organs in the street in 6 months?' Once they are used to confer legitimacy to British ideals, will the soldier be effectively 'used up'?" (Detloff 6). In "Thoughts on Peace" death as meaning-making practices is destabilized when the binary oppositions such as German/English dissolve amidst a friendly exchange between English citizens and a German soldier. Woolf gives us a contrasting example to death: friendship, trust, and life. In *Mrs. Dalloway* we see this happen to Septimus. The fact that his friend Evans was killed, that his life is sacrificed for an 'ideology', is so preposterous and unacceptable that he threw himself out a window rather than conform to the patriarchy and its values.

Also recruiting soldiers is done through the advertisement of ideals, of self-sacrifice for the honor of defending the nation, but also through the promises of employment, economic benefits, free education (nowadays), and travel. Rousing men (and now women) to the front lines is done through "military's appeal to the young and the poor with promises of fulfillment, travel, and education. (In July 1990, N.W. Ayer, Inc., was awarded a "Certificate of Achievement" by the U.S. Army in recognition of its "Be All You Can Be: [!] campaign. Proudly displayed in full page newspaper ads, the certificate notes this to have been 'acknowledged by the advertising industry as the most successful recruiting campaign of all time'" (Hussey 9). Armies, battalions, and individuals are sacrificed and used in a strategy to win by killing.

It is a shame to die for ideals that are fallacious at their core, that are unauthentic. Knowing firsthand what it means to lose a loved one, Woolf condemned war as an instrument that lays waste to lives for its lofty ideals, which at their core were untrue. Both in Woolf's fiction and her non-fiction we become cognizant of the misery that the ruling hegemony/patriarchy creates in men and women as its squashes their true desires and replaces them with the accepted/normative desires of the patriarchy. This is recognizable in *Mrs. Dalloway*, when Dr. Bradshaw is speaking to Septimus seeing him as another "case" of shell-shock, as his "patient", not as another human being or equal. For Dr. Bradshaw his patient Septimus is his inferior 'Other'. "As the persecutors purge themselves of their violence by projecting their own differences upon a scapegoat who is in reality not different from themselves, so the masculinized culture of the public sphere turns the biological sign of sexual difference, which in reality marks each sex in relation to the other, into a social sign of the victim" (Froula 33).

Although Septimus and Bradshaw are both Englishmen, Septimus is ill, overwhelmed by his *emotions* of trauma. Dr. Bradshaw sees him as a pitiful creature that needs his intelligence to function properly again, an unsolved equation, an object. The differentiation between Bradshaw and Septimus is one of mental health as opposed to mental illness. But his PTSD was produced by the patriarchy that Septimus fought to defend by risking his own life; in a twist of irony, the ideals he protected are now destroying him. In order to fight, maim, and kill he had to transform himself into a robot. A person incapable of feeling pain, fear, remorse, love, guilt so that he could function as the warrior he was commanded to become. "Even taste (Rezia liked ices, chocolates, sweet thing) had no relish to him…He looked at people outside; happy they seemed, collecting in the middle of the street, shouting, laughing, squabbling over nothing. But he could not taste, he could not feel" (*Mrs. Dalloway* 94-5). The occlusions

of feeling that help him survive the war continue to trap him in this sense of emptiness and apathy. Life has lost all meaning for Septimus. All he wants now is to kill himself.

In contrast, Woolf's "Thoughts on Peace in an Air Raid" speaks of the occupation of a soldier as an "instinct". "The young airman up in the sky is driven not only by the voices of loudspeakers; he is driven by voices in himself—ancient instincts, instincts fostered by education and tradition" ("Thoughts on Peace" 2). Within that phrase she parodies the instinct to serve at war by saying that they are "fostered by education and tradition" because instincts do not need to be fostered. They are already ingrained within the individual. Thus she subverts said instinct by naming the culprits that transforms civilians into warriors/soldiers. Really, what is the occupation of a soldier? It requires them to kill, to murder, to plunder and conquer. Whether this tyranny of patriarchy be to have women be docile ladies imprisoned in the domestic sphere, or to childbearing, or curb 'deviant sexualities', or eradicate an enemy country it all amounts to the same: control, ego, personal perception of what is true, right, just, and worth fighting for. Hitherto, where personal perception and egos are concerned the danger is that truth is often subjective, colored by individuals' past experiences and consciousness.

"Thoughts on Peace" was a direct call to the individual to rise against the ideas of what constituted them as a person, to wake up and question if their self was an imitation of their culture's beliefs, or was it their own? "We can see shop windows blazing; and women gazing; painted women; dressed-up women; women with crimson lips and crimson fingernails. They are slaves who are trying to enslave. If we could free ourselves from slavery we should free men from tyranny" ("Thoughts on Peace" 2). As long as the self performs the script handed to it without questioning its validity or authenticity, we run the risk of becoming a character whose actions, words, and life run contrary to our true desires and wishes. The need to question every notion we know to be true is paramount to creating a society of harmony. Otherwise we will keep seeing patterns of a dissident marginalized group be hurt and victimized by the established power hierarchies of their society. If they do not question the codes set in place, how can they ask for the codes to be amended?

Performing our role in society is often a matter of living our day-to-day lives, accepting the culture we are born into, often without challenging it. Power hierarchies cannot be molded or modified if the individuals subject to this power do not reflect on the implications of the codes that said power has lain out. These implications pertain to the attached legal, psychological, physical, and other features [e.g., age, sex/gender, sexual orientation, race, class] that create the subject of a society. The subject cannot ever know itself outside the norms, mores, and convention of its spatial-temporal existence, but it can still question how their self identifies with those systems of beliefs and therefore become an agent of social change. The theory of performativity which lends incredible autonomy to the deed rather than the doer, asserts as Woolf does, that if we want the rules to change. we have to play with the meanings such a system has handed to us. Only when you begin to open yourself to finding the instabilities in your beliefs and that of culture can you open the realm of meaning-making to transform. And if the women of Pakistan and India want to question, they can, but the stakes for them are high. Their life is on the line. So it is up to the free and the privileged to 'fight with the mind' (Thoughts on Peace 1).

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Measuring the Financial Impact of Process-Level Decisions for an Electronic Distribution Firm

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Abstract: *Effective management of procurement process, inventory portfolio, and customer relations is of paramount importance to distribution firms. Enforcing changes at the process level without consideration for the associated financial impact in terms of shareholder value may result in suboptimal business value creation. In this research, we propose methodologies to evaluate strategies pertaining to supplier, inventory and customer management and measure the associated financial impact on the cash flow, profitability, revenue growth and asset efficiency metrics. In particular, we apply the proposed methodology to the data obtained from an industrial distributor for electronic products. We perform supplier, inventory and customer stratification for improving the performance of out-of-control suppliers, non-performing product lines, and non-profitable customers. We provide managerial recommendations for implementing strategies that not only improve profitability, but also features higher asset efficiency for the distributor's warehouse located in Houston, TX. We developed an analysis framework using MS Excel, which can be easily modified to analyze different decision strategies for other similar distribution firms.*

INTRODUCTION

In this project, we provide managerial recommendation for a strategic supplier, inventory and customer management initiative at a distribution company by name Hisco, Inc. The company was established in 1940's in Houston as a supplier for industrial equipment. Currently, the company has 30 branches of which 22 branches are located in the US including Puerto Rico and the Dominican Republic. The remaining 8 branches serve customers in Mexico. All the branches provide their customers with high quality products and services.

Hisco provides service to customers in electronic assembly, fiber optic, aerospace, defense, renewable energy, medical device and other industrial sectors. Hisco stocks more than 55,000 products from suppliers such as 3M, Brady, Cookson, GE Silicones, and Loctite. In this study we will be working with 20 product lines, 10 suppliers, and 10 customers.

Due to the impact of the great recession during 2008-2010, the decrease in sales revenue resulted in a significant loss for the company. In order to sustain the business without filing for bankruptcy protection, Hisco's management considered radical changes in terms of cost cutting initiatives.

In this project, we first perform inventory stratification of products and propose an inventory management policy based on the stratification. This proposed strategy includes liquidating certain product lines that are least profitable to the company and redeployment of recovered capital into

more profitable items. We analyze the optimality of our strategy based on the financial statements of the company. Then, we perform supplier stratification to identify and improve the performance of out-of-control suppliers. By implementing supplier training which will then raise the completeness (quality) index will in the long term improve the performance of the out-of-control suppliers. Lastly, we perform customer stratification to identify non-profitable customers. We recommend that management should reduce the expenses by minimizing the shipment frequency to the non-profitable customers.

We measure the financial impact of the proposed strategies by computing the financial metrics that measure cash flows, profitability, growth, and asset efficiency as shown in Figure 1.1 as proposed by Lawrence et al., (2009). These financial metrics are used to analyze and relate the income statement, balance-sheet, and cash flow statement. Such an analysis makes it useful to both the management and shareholders/stakeholders in evaluating the performance of the company in terms of its financial health (Fender et al., 2007). Next, we briefly describe each of the metric included in Figure 1.1.

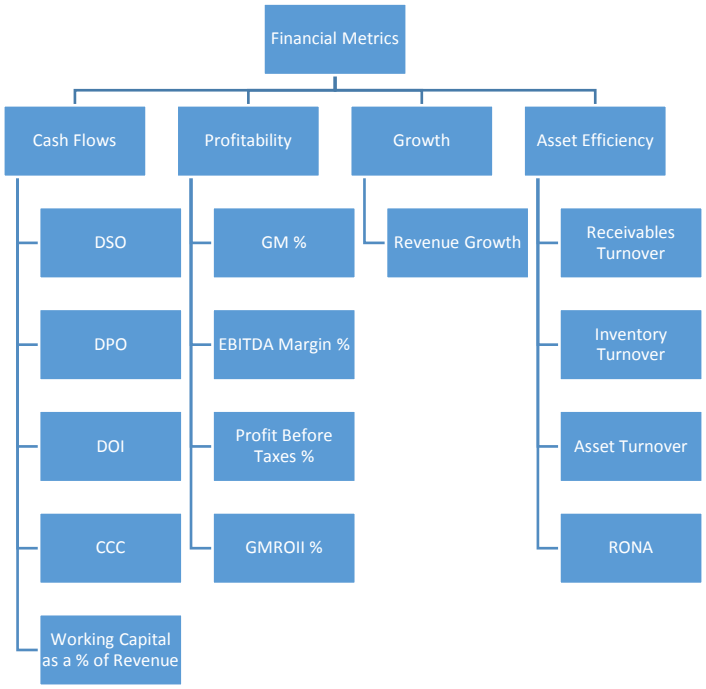

Figure 1.1: Financial Metrics

Cash flow metric includes the days sales outstanding (DSO), days payable outstanding (DPO), days on inventory (DOI), cash conversion cycle (CCC), and working capital as a percentage of revenue. The formula for DSO is 365 multiplied by accounts receivable divided by annual revenue. The formula for DPO is 365 multiplied by accounts payables divided by annual COGS. Similarly, the DOI is 365 multiplied by inventory dollars divided by annual COGS.

Gross margin percentage of revenue (GM %), earnings before interest depreciation and amortization percentage of revenue (EBITDA%), profit before taxes percentage of revenue, and gross margin return on inventory investment (GMROII) are used to measure the profitability dimension. The formula for gross margin percentage is GM %= (Revenue-COGS)/Revenue. The formula for EBITDA %= (Revenue – COGS- Operation cost)/Revenue. Profit before taxes percentage is calculated by dividing the

EBIT by inventory. GMROII % is calculated by dividing the difference between revenue and COGS by inventory. Growth is determined by the revenue growth which is the current revenue minus previous revenue divided by previous revenue.

In order to measure asset efficiency, we determine the receivables turnover, inventory turnover, asset turnover, and return on net assets (RONA). Receivables turnover is calculated by dividing the revenue by account receivables. The COGS divided by inventory determines the inventory turnover. The asset turnover formula is revenue divide by the total assets. Lastly, the RONA is EBITDA divided by net assets.

1. LITERATURE REVIEW

The distribution management literature (Lawrence et al., 2009) describes the inventory stratification as the process of prioritizing inventory to determine 'what goes where'. Some critical dimensions considered in the prioritization of inventory includes the sales revenue, velocity (or sales hits) and profitability. The purpose of inventory stratification is to classify items into a certain number of categories and devise a policy such that managing the inventory items on a day-to-day basis doesn't become unwieldy.

Lawrence et al., (Lawrence, 2009) describes three distinct industry practices, namely the common, good and the best practices. The common practice observed in many firms includes no stratification, or classification based on product line grouping, or sales-based ranking. In general, the inventory decisions are not connected to purchasing decisions. Good inventory management practice includes classification and management of inventory based on sales volume (revenue) and the logistical factors such as sales hits. The best practice includes classification of inventory based on profitability – such as the GMROII, sales hits and sales dollar value. Thus, the best practice is a multi-criteria based combination method.

In the lean production literature (Nahmias, 2005), the multi-product inventory classification is described as the *ABC classificatio*n or *ABC analysis*. The purpose of this analysis is to differentiate profitable items from unprofitable items. To do so, the ABC analysis borrows the Pareto concept from the economics theory that applies a large portion of the total dollar volume of sales often accounted for by a small number of inventoried items. The analysis assumes that the items are ranked in decreasing order of dollar value of annual sales. Typically, the top 20 percent of items account for about 80 percent of the annual dollar volume of sales, the next 30 percent of the items for the next 15 percent of sales, and the remaining 50 percent for the last 5 percent of dollar volume (Nahmias, 2005). These three groups are labeled A, B, and C, respectively. When a finer distinction is needed, four or five categories could be used. Even when using only three categories, the percentages used in defining A, B, and C items could be different from the 80 percent, 15 percent, and 5 percent recommended.

Next, we describe the commonly practiced inventory management policy described in the inventory management literature (Nahmias, 2005). The class A items account for the largest share of yearly revenue, and hence, these items should be managed very carefully. Inventory levels for A items should be monitored continuously. More sophisticated forecasting procedures might be used and more care should be taken in the estimation of the various cost parameters required in calculation operating policies. For the class B items, inventories could be reviewed periodically, items could be ordered in groups rather than

individually, and somewhat less sophisticated forecasting method could be used. The minimum degree of control would be applied to C items. For very inexpensive C items with moderate levels of demand, large lot sizes are recommended to minimize the frequency that these items are ordered. For expensive C items with very low demand, the best policy is generally not to hold any inventory. One would simply order these as they are demanded.

Lawrence et al., (Lawrence, 2009) explains supplier stratification based on the profitability, distributor services (DS), performance, growth potential and loyalty of the distributor. The main objective of the supplier stratification methodology is to understand the criticality of the supply base and to allocate key resources accordingly. Supplier stratification works in the long term by improving profitability. It takes into account the gross margin and profitability of a supplier. Also a suppliers performance, loyalty and distributor services is assessed. This type of stratification categorizes the suppliers into four categories: strategic partners, vendor controlled, distributor controlled, and out-of-control suppliers. Suppliers that are vendor controlled are a strong brand, exclusive, are service intensive, and have a low market control. Strategic partners facilitate a strong brand, exclusive, and have a high market control. Distributor controlled suppliers represent a weak brand of products, have product shortages, high market control, and are short term relationship. Lastly out-of-control suppliers also represent a weak brand, service intensive, and have a low market control relationship. These factors are depicted in Figure 2.1.

Figure 2.1: Types of Suppliers (Source: Lawrence et al., 2009)

According to Lawrence et al., (2009) a vendor controlled supplier is the most efficient because they do not juristically raise logistic costs or inventory expenses. However there is a high cost for certain services when doing business with a vendor controlled supplier. They require high loyalty and protection of their brands. Strategic partners have a balanced relationship between the supplier and the distributor. Profitability is high with this type of supplier. Distributor controlled suppliers are profitable and unchallenged in the market, yet they are not sustainable because they can easily be replaced with another supplier. Out-of-control supplier relationships are very unhealthy because they are cunning suppliers who are reluctant to establish a market.

Customer stratification is based on the cost to serve (CTS), gross margin, sales volume, and loyalty (Customer Life) of customers (Lawrence et al., 2009). This stratification analyzes the profitability of each customer. Based on these four factors each customer is categorized into one of the four categories: opportunistic customers, core customers, marginal customers, and service drain customers. Opportunistic customers have a high profitability, no

relationship with the company, low cost to serve, and low volume. Similarly, core customers have high profitability, sustained relationship with the company, low cost to serve, and high volume. On the other hand, marginal customers have low profitability, no relationship with the company, high cost to serve, and low volume. The fourth category, service drain customers, has low profitability, a sustained relationship with the company, high cost to serve, and high volume (Lawrence et al., 2009). These factors are shown in Figure 2.2.

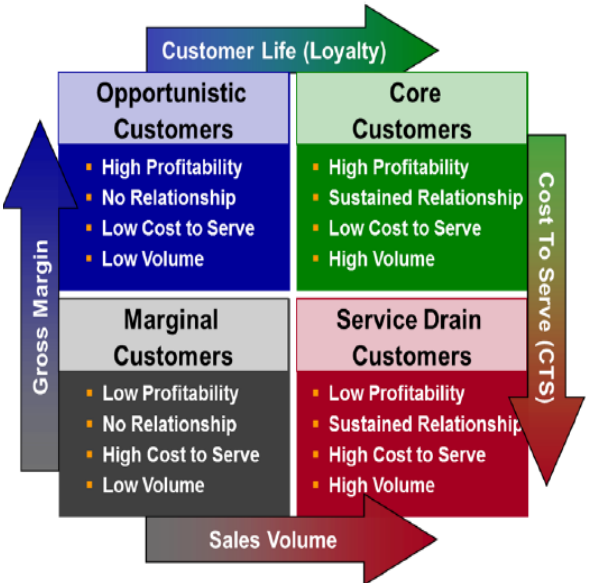

Figure 2.2: Types of Customers (Source: Lawrence et al., 2009)

Customer stratification is beneficial because it strengthens relationships with customers by analyzing the loyalty of each customer (Winer, 2007). This strategy identifies the weak relationships between distributor and customer. From customer stratification measures are proposed in order to increase profitability with customers as well as strengthen their relationship (Russell & Taylor, 2009).

In the next section, we utilize the inventory, supplier and customer stratification methods to analyze proposed management strategies for the distribution company under consideration.

2. SOLUTION APPROACH

For the purpose of analysis, we used the data presented in Appendix 1.1 for inventory stratification, the data presented in Appendix 2.1 for supplier stratification, and the data presented in Appendix 3.1 for customer stratification.

2.1. Inventory Stratification and its Financial Impact

In order to perform inventory stratification we divide the product lines of the company into four classes: A, B, C, and D, based on the following guidelines presented in Table 3.1.1. Points 1-4 are assigned to each percentile in each dimension provided to us by the management. For instance, for sales volume dimension, the products in the top 15 percentile are assigned 4 points. The products in the next 20 percentile are assigned 3 points, the next 25 are given 2 points, and lastly the products in the bottom 40 percentile are given 1 point. The sales hits assignments follow a similar pattern: the top 20 percentile is assigned 4 points, the next 20 is assigned 3 points, the next 20 is assigned 2 points, and the bottom 40 is assigned 1 point. For the GMROII %, the best-in-class inventory items that have GMROII value of 300% or greater are assigned 4 points. Those items with GMROII value between 150% and 300%, are assigned 3 points, and the items with GMROII values between 100% and 150%, are assigned 2 points. The remaining items are assigned 1 point.

Inventory Stratification					
GMROII %		**Sales Volume**		**Hits**	
50%		**30%**		**20%**	
Percentage	**Points**	**Percentile**	**Points**	**Percentile**	**Points**
>=300%	4	Top 15	4	Top 20	4
>=150% and < 300%	3	Next 20	3	Next 20	3
>=100% and < 150%	2	Next 25	2	Next 20	2
< 100%	1	Bottom 40	1	Bottom 40	1

Table 3.1.1: Individual Ranking Guideline for Inventory Stratification

After each grade point is assigned, we then aggregate using the weighted average method the grade points to compute an overall rank for each product line. Based on the input from the management, the GMROII % is assigned a weight of 50%, Sales Volume is given a weight of 30%, and sales hits was assigned a weight of 20% for computing the overall aggregate points. From these percentages we can classify the products into four categories: Class A, Class B, Class C, and Class D depending on the range of the values, the guidelines of which are shown in Table 3.1.2. The results are shown in Appendix 1.2.

Class	Range
A	[3.25, 4.0]
B	[2.75, 3.25)
C	[1.75, 2.75)
D	[0, 1.75)

Table 1.2: Overall Ranking Guideline for Inventory Stratification

After each product is categorized into a class, the profitable and unprofitable products is summarized in Table 3.1.3.

DATA	Current Sales $	Current COGS $	Current Inv $	Total PLs
Total	$ 148,265,879.00	$ 110,902,877.49	$17,470,662.74	20
A	$ 96,372,821.35	$ 72,086,870.37	$ 4,891,785.57	3
B	$ 26,687,858.22	$ 19,962,517.95	$ 3,668,839.18	4
C	$ 22,239,881.85	$ 16,635,431.62	$ 4,367,665.69	5
D	$ 2,965,317.58	$ 2,218,057.55	$ 4,542,372.31	8

DATA	Current Sales	Current COGS	Current Inv	PLs
Total	100%	100%	100%	100%
A	65%	65%	28%	15%
B	18%	18%	21%	20%
C	15%	15%	25%	25%
D	2%	2%	26%	40%

Table 3.1.3: Summary of Results of Inventory Stratification

From Table 3.1.3, we infer that the company is currently investing 65% of its inventory in non-profitable, C and D items. Consequently, we recommend the management to discontinue and recover the locked-up capital in C and D class inventories. The management was willing to reduce the C and D items by 58% and 100%, respectively. That is, C items will be reduced to 42% of the current level, and D items will be completely liquidated. The company expects 100% recovery of capital for C items due to revenue from promotional sales. However, only 95% of the value of inventory is expected to be recovered due to liquidation. Table 3.1.4 below illustrates the capital amount recovered due to inventory reduction.

Class	Current Inventory	Liquidation %	Capital Recovery %	Expected Capital Recovery
C	$ 4,367,665.69	58%	100%	$ 2,533,246.10
D	$ 4,542,372.31	100%	95%	$ 4,315,253.70
			Total Amount Recovered	$ 6,848,499.79

Table 3.1.4: Recovery of Capital after Inventory Reduction and Liquidation

The distributor plans to pay the long term debt using 50% of the recovered capital and redeploy the other 50% to class A and B inventories. Based on the feedback from sales department, the redeployment was expected to be 75% and 25% for A and B inventories, respectively. The sales department also expects inventory turns for A and B items on the additional inventory to be 10 and 5, respectively. Moreover, reduction of C and D inventories is expected to result in 25% and 100% lost sales, respectively. Table 3.1.5 shows the computed incremental inventory levels, Cost of Goods Sold (COGS), and sales revenue.

Class	Incremental Inventory	Expected Inventory Turns for Incremental Inventory	Incremental COGS (=IT*Inventory)	Lost Sales	Incremental Sales Revenue
A	$ 2,568,187.42	10	$ 25,681,874.23		$ 34,334,056.46
B	$ 856,062.47	5	$ 4,280,312.37		$ 5,722,342.74
C	$ (2,533,246.10)		$ (4,158,857.91)	25%	$ (5,559,970.46)
D	$ (4,542,372.31)		$ (2,218,057.55)	100%	$ (2,965,317.58)
Total	$ (3,651,368.51)		$ 23,585,271.15		$ 31,531,111.16

Table 3.1.5: Incremental Inventory, COGS, and Sales Revenue

Table 3.1.6 summarizes the total expected inventory, COGS, and sales revenue values after the proposed measures are applied.

DATA	Expected Inv $	Expected Sales $	Expected COGS $
Total	$ 13,819,294.23	$ 179,796,990.16	$ 134,488,148.64
A	$ 7,459,972.99	$ 130,706,877.81	$ 97,768,744.60
B	$ 4,524,901.65	$ 32,410,200.96	$ 24,242,830.32
C	$ 1,834,419.59	$ 16,679,911.39	$ 12,476,573.72
D	$ -	$ -	$ -

Table 3.1.6: Summary of total inventory, COGS, and Sales Revenue Values

Next, we measure the financial impact of the proposed measures of inventory reduction and redeployment by measuring the changes to the financial metrics. First, we compute the gross margin percentage values, which connect revenues to gross profits. The current and the expected gross margins are shown in Table 3.1.7.

	Current	Expected
Sales Revenue	$ 148,265,879.00	$ 179,796,990.16
COGS	$ 110,902,877.49	$ 134,488,148.64
Gross Margin ($)	$ 37,363,001.51	$ 45,308,841.52
Gross Margin (% of Revenue)	25.20%	25.20%

Table 3.1.7: Current and Expected Gross Margin Percentages

We infer that there is no impact on the gross margin percentage. However, the GM ($ value) is higher for the inventory reduction and redeployment strategy.

EBITDA % takes into account the operation cost deducted from the gross margin value. Based on the current financial statements, the current operation expenses with its corresponding variable percentages are shown in Table 3.1.8.

Operating Expenses	Current Amount	Variable Component
Employee Compensation (Sales)	$ 9,059,045.21	75%
Employee Compensation (Others)	$ 9,385,230.14	10%
Warehouse Expenses	$ 4,477,629.55	50%
Delivery Expenses	$ 4,536,935.90	80%
Other Expenses, General & Admin	$ 2,194,335.01	75%
Total	**$ 29,653,175.80**	

Table 3.1.8: Current Operating Expenses

In Table 3.1.9, we calculate the expecting operating expenses by assuming that the ratio of the expected variable portion to the expected revenue to be the same ratio as the current variable portion to the current sales revenue. Variable components vary with the type of operating expenses while fixed components remain constant.

		Current = Expected				
Operating Expenses	Overhead Component	Overhead Cost	Current Variable Cost	Sales Revenue Increase	Expected Variable Costs	Expected Operating Expenses
Employee Compensation (Sales)	25%	$ 2,264,761.30	$ 6,794,283.91	1.21	$ 8,239,197.07	$ 10,503,958.38
Employee Compensation (Others)	90%	$ 8,446,707.13	$ 938,523.01		$ 1,138,114.95	$ 9,584,822.07
Warehouse Expenses	50%	$ 2,238,814.77	$ 2,238,814.77		$ 2,714,934.55	$ 4,953,749.32
Delivery Expenses	20%	$ 907,387.18	$ 3,629,548.72		$ 4,401,430.32	$ 5,308,817.50
Other Expenses, General & Admin	25%	$ 548,583.75	$ 1,645,751.26		$ 1,995,746.59	$ 2,544,330.34
					Total	**$ 32,895,677.62**

Table 3.1.9: Expected Operation Expenses

In Table 3.1.10, we compute the current and expected EBITA margin and we infer that the recommended strategy is more profitable.

	Current	Expected
Sales Revenue	$ 148,265,879.00	$ 179,796,990.16
COGS	$ 110,902,877.49	$ 134,488,148.64
Operating Expenses	$ 29,653,175.80	$ 32,895,677.62
EBITDA ($)	$ 7,709,825.71	$ 12,413,163.90
EBITDA Percentage	5.20%	6.90%

Table 3.1.10: Current and Expected EBITA Percentages

The new strategy is better in terms of EBITDA margin in comparison to the current scenario.

Next, we measure the asset efficiency metric in terms of Return on Net Assets (RONA). For the purpose of computing the expected financial elements of the balance sheet, we assume the expected Days Payable Outstanding (DPO) and Days Sales Outstanding (DSO) values to be the same as the current DPO and DSO values, respectively. The DSO measures how long the distributor takes to collect from customers once the sale is made. The DPO determines how long the distributor takes to pay the suppliers. The current and expected return on net assets values are computed assuming the balance-sheet elements presented in Table 3.1.11.

	Balance-Sheet Elements	Current	Current DSO	=Expected DSO	Expected
Assets	Inventory	$ 17,470,662.74	DSO	DSO	$ 13,819,294.23
	Accounts Receivable	$ 18,848,045.99	46.4 days		$ 22,856,384.50
	Cash & Market Securities	$ 1,990,029.00			$ 1,990,029.00
	Other Current Assets	$ 1,978,468.00			$ 1,978,468.00
	Fixed & Non-current Assets	$ 6,153,033.98			$ 6,153,033.98
			Current DPO	=Expected DPO	
Liabilities	Notes Payables	$ 1,427,456.00	DPO	DPO	$ 1,427,456.00
	Accounts Payable	$ 9,874,913.75	32.5 days		$ 11,974,972.14
	Other current liabilities	$ 1,351,083.75			$ 1,351,083.75
	Non-current liabilities and debt	$ 4,053,251.25			$ 629,001.35

Table 3.1.11: Current and Expected Assets and Liabilities

In Table 3.1.12, we compute the RONA% which shows that the Asset efficiency increases drastically for the recommended strategy.

	Break-point Values				
	Performance and Exclusivity			Services and Profitability	
Points	Completeness Index	Accounts Payables	Exclusivity	Distributor Services	Gross Margin
	70%	10%	20%	40%	60%
1	< 0.85	< 40	< 0.12	> 60	< 40
2	>=0.85 and <0.90	>=40 and < 60	>=0.12 and < 0.25	> 40 and <= 60	>=40 and < 60
3	>= 0.9 and <0.95	>= 60 and < 80	>=0.25 and < 0.5	> 20 and <= 40	>= 60 and < 80
4	>= 0.95	>= 80	>= 0.5	<= 20	>= 80

	Current	Expected
Total Assets	$ 46,440,239.71	$ 46,797,209.71
Total Liabilities	$ 16,706,704.75	$ 15,382,513.24
Net Assets	$ 29,733,534.96	$ 31,414,696.47
EBITDA	$ 7,709,825.71	$ 12,413,163.90
RONA	25.93%	39.51%

Table 1.12: Return on Net Assets

Next, we measure the sales revenue growth that measures the yearly growth of the distributor. Revenue growth percent is computed by taking the difference of the current year revenue and previous year revenue divide by the previous year revenue as shown in Table 3.1.13.

Sales Revenue Growth	Current	Expected
	$ 148,265,879.00	$ 179,796,990.16
Growth Percentage	21.27%	

Table 1.13: Revenue Growth

The new strategy has higher profitability, better asset efficiency, better cash flow metrics, and higher sales revenue growth. Consequently, the proposed strategy is not only profitable, but also incorporates the benefit of lean management.

2.2. Supplier Stratification and its Financial Impact

We use the data provided in Appendix 2.1 and follow the guidelines provided in Table 3.2.1 for the purpose of supplier stratification. The supplier stratification is used to classify each supplier into the class of strategic, vendor controlled, distributor controlled, or out-of-control suppliers. Similar to the inventory stratification of product lines, we utilize different critical factors, based on which points ranging from 1 to 4 are assigned. As shown in Table 3.2.1, we categorize the values based on two different dimensions. The first dimension is based on Performance and Exclusivity, whereas, the second is based on services and profitability. The performance and exclusivity dimension contains the completeness index (CI), accounts payables (A/P) and exclusivity as the critical factors. The services and profitability dimension contains the distributor services and gross margin.

For the CI, if the value is less than 0.85, then we assign 1 point, if its between 0.85 and 0.90, we assigned 2 points, and so on. The assignment of points to the other critical factors follows a similar pattern.

Table 3.2.1: Individual Ranking Guidelines & Overall Ranking for Supplier Stratification

After each grade point is assigned, we then combine the grade points of each critical factor for each supplier to derive an overall point for each dimension. The CI is assigned 70% weight, A/P is assigned 10% weight, and exclusivity is given 20% weight.

The DS and GM are assigned 40% and 60% weights, respectively.

From these percentages we classify the suppliers into four categories: strategic, vendor controlled, distributor controlled, and out-of-control suppliers by points range. More specifically, suppliers are classified as strategic when they have a performance and exclusivity measure of 2.75 or above and services and profitability measure of 2.75 or above. Suppliers are vendor controlled when they have a performance and exclusivity value of 2.75 or above and services and profitability value of 2.74 or below. Suppliers are distributor controlled when they have performance and exclusivity value of 2.74 or below and services and profitability value of 2.75 or above. Whereas, suppliers are classified as out-of-control, when they have performance and exclusivity value of 2.74 or below and services and profitability value of 2.74 or below.

The results are shown in Appendix 2.2. The summary of the results of supplier stratification can be seen in Table 3.2.2.

Type of Relationship	Distributor Services	A/P	Gross Margin	Sales Revenue	Number of Suppliers	COGS
Strategic	77,243	140,957	560,403	2,354,236	3	1,793,833
Vendor Controlled	187,643	187,653	705,605	3,425,633	5	2720028
Distributor Controlled	-	-	-	-	0	0
Out of Control	873,525	72,872	87,204	1,215,501	2	1128297
Total	1,138,411	401,482	1,353,212	6,995,370	10	5,642,158

Table 3.2.2: Summary of the Results of Supplier Stratification

Based on the summary of supplier stratification, we observe that the two out-of-control suppliers require $873,525 in Distributor Services, they have $72,872 of accounts payables, and they provide $87,204 worth of products in Gross Margin corresponding to $1,215,501 in Sales Revenue as shown in Table 3.2.2. The two out-of-control suppliers were identified to be Supplier 4 and Supplier 8.

Firstly, we recommend the following improvement measures for the out-of-control suppliers. The first measure is to increase the completeness index of the out-of-control suppliers to 0.9. As per the procurement team's feedback, this measure necessitates negotiation of a supply contract and implementation of supplier training at a cost of $100,000 per out-of-control supplier. However, an increase in CI will reduce the COGS, A/P, and warehouse expenses as shown Tables 3.2.3 - 3.2.5.

Suppliers	Current COGS	Actual COGS for good products	Set the Expected CI	Expected COGS
S1	705,643			
S2	464,792			
S3	529,970			
S4	**556,549**	367,322	0.9	**408,135.9**
S5	617,979			
S6	587,534			
S7	530,235			
S8	**571,748**	400,224	0.9	**444,692.9**
S9	519,488			
S10	558,220			

Table 3.2.3: Current and Expected Values for COGS

	2	
	Balance-sheet	
Suppliers	Assume Current DPO := Expected DPO	Expected A/P
S1		
S2		
S3		
S4	**25.7**	28,692
S5		
S6		
S7		
S8	**21.5**	26,247
S9		
S10		

Table 3.2.4: Reduction in Accounts Payables (A/P)

	3	4	
	Operating Expenses: income Statement		Income Statement: Operating Expenses
Suppliers	Quality training Costs	Decrease in COGS	Reduction in Warehouse Expenses = 35% of Decrease in COGS
S1			
S2			
S3			
S4	100,000	148,413	51,944.57
S5			
S6			
S7			
S8	100,000	127,055	44,469.29
S9			
S10			

Table 3.2.5: Reduction in Warehouse Expenses

Secondly, we recommend reduction in the distributor services to 10% of the current value for each out-of-control supplier. About 55% of the dollar value of reduction in DS for Suppliers 4 and 8 represents fixed assets. The distributor expects to recover 89% of the value of the fixed assets. The remaining 45% of the reduction in DS for the out-of-control suppliers represents operational expenses. The calculations are shown below in Table 3.2.6.

	5				
			Balance-sheet	Income statement	
Suppliers	Expected Savings in DS = 90% of the current DS	55% of DS is in Fixed Asset	Expected value recovered (89%) from sale of Fixed Assets	Expected Savings in Operating Expenses = 45% of DS is in operating Expense	Current Type
S1					Strategic
S2					Vendor Controlled
S3					Strategic
S4	431,949.60	237,572.28	211,439.33	194,377.32	Out of Control
S5					Vendor Controlled
S6					Vendor Controlled
S7					Vendor Controlled
S8	354,222.90	194,822.60	173,392.11	159,400.31	Out of Control
S9					Vendor Controlled
S10					Strategic

Table 3.2.6: Recovery of the Fixed Assets

Next, we measure the financial impact of the two proposed measures for improving the supplier performance. The GM% shows the effectiveness of implemented measures as shown in Table 3.2.7. The company is expected to get a higher dollar amount in gross profits due to the proposed changes. The EBITDA % will better determine the effectiveness of the implemented measures due to the inclusion of operating expenses while computing the profit margin.

	Current	Expected
Sales Revenue	6,995,370	6,995,370
COGS		5,366,690
Gross Margin	1,353,212	1,628,680
Gross Margin Percentage	19.34%	23.28%

Table 3.2.7: Gross Margin

Based on the following operating expenses incurred by the distributor (Table 3.2.8), the EBITDA margin as a percentage of revenue is calculated and summarized in Table 3.2.9.

Operational Expenses	Amount
Employee Compensation (others)	$ 223,106.87
Employee Compensation (sales)	$ 239,511.79
Warehouse Expenses	$ 203,585.02
Delivery Expenses	$ 271,446.70
Other Expenses, General and Admin	$ 169,654.19

Table 3.2.8: Operational Expenses

	Current	Expected
Sales Revenue	6,995,370	6,995,370
COGS	5,642,158	5,366,690
Operating Expenses	1,107,305	857,113
EBITDA Margin (Operating Margin or Operating Profit)	245,907	771,567
EBITDA Margin as a percentage of revenue	3.52%	11.03%

Table 3.2.9: EBITDA Margin

From Table 3.2.9 we conclude that the EBITDA increased significantly for the proposed strategy. Hence, this proposed strategy is highly profitable for the company.

Next, we calculate the RONA to determine the profitability of the proposed strategy by taking into account the assets and liabilities of the distributor for the past year and its expected assets and liabilities due to the proposed measures. The current and expected assets and liabilities are shown in Table 3.2.10.

	Balance-Sheet	Current	Expected DOI	Expected Amounts
Assets	A/R	$ 694,410.39		$ 694,410.39
	Cash & securities	$ 1,439,495.94		$ 1,439,495.94
	Inventory	$ 32,467.56	2.01	$ 29,553.55
	Other Current Assets	$ 1,243,854.58		$ 1,243,854.58
	Fixed and Non-Current Assets	$ 3,038,149.46		$ 2,605,754.59
Liabilities	Notes Payable	$ 680,652.41		$ 680,652.41
	A/P	$ 401,483.31		383,549
	Other Current Liab	$ 421,661.58		$ 421,661.58
	Non-current Liab & Long-term debt	$ 1,534,848.13		$ 1,150,016.69

Table 3.2.10: Current and Expected Balance Sheet Elements

In order to compute the RONA, we take the EBITDA amount and divide that by the net assets. This computation is shown in Table 3.2.11.

	Current	Expected
Total Assets	$ 6,448,377.93	$ 6,013,069.05
Total Liabilities	$ 3,038,645.43	$ 2,635,879.97
EBITDA Amount	$ 245,907.43	$ 771,567.10
Net Assets	$ 3,409,732.50	$ 3,377,189.08
RONA	7.21%	22.85%

Table 3.2.11: Calculated Return on Net Assets

Based on the GM, EBIDTA Percentage, and the RONA we can infer that the proposed strategy is not only profitable, but also more efficient.

2.3. Customer Stratification and its Financial Impact

We use the data set in Appendix 3.1 and perform customer stratification and analysis. The data recorded is from the prior year and the values are expected to be similar for the current year. The data includes critical factors, namely: the Sales Force Hours (SFT), CTS – Delivery (CTS), Accounts Receivable (A/R), Gross Margin (GM), Customer of Goods Sold (COGS), and Loyalty. We utilize these critical factors to compute current and expected COGS. Next, we compute the expected gross margin and compare it with the current value. Then we compute and compare the current and expected operating margins (EBITDA values) based on the following operating expenses incurred by the distributor. Next, compute the return on net assets, assuming the following balance-sheet elements.

Customer stratification for this company follows the guidelines presented in Table 3.3.1. Similar to the inventory and supplier stratification, percentile points are assigned to certain critical factors, the guidelines of which were provided by management.

For instance, SFT, CTS, and A/R values that are greater than the 60-th percentile are

assigned 1 point, values greater than 40-th percentile are assigned 2 points, values greater than 20-th percentile are assigned 3 points, and the remaining values are assigned 4 points. Similarly, we assign points for the other critical factors such as the GM, COGS, and Loyalty based on the guideline in Table 3.3.1. The assigned points for each customer are shown in Appendix 3.2.

After each customer are given points, the points are then combined for each customer to derive the aggregate points for the CTS and Margin dimension and the Sales and Loyalty dimension, separately. The SFT, CTS, A/R, and GM are allotted 30%, 10%, 10% and 30% weights, respectively. The COGS is given 70% weight. Loyalty, which is expressed in number of years a customer has done business with the distributor, is given 30% weight. We then combine the points for each item which provides each customer their aggregate points.

Each customer is identified as core, opportunistic, service drain, or marginal customer Customers are classified as core when they have CTS and Margin of 2.75 or above and Sales and loyalty of 2.75 or above. Customers are named opportunistic when they have CTS and margin of 2.75 or above and sales and loyalty of 2.74 or below. Customers are classified as service drain when they have CTS and margin of 2.74 or below and sales and loyalty of 2.75 or above. Customers are called marginal when they have CTS and margin of 2.74 or below and sales and loyalty of 2.74 or below.

	Break- Point Values	
	CTS and Margin	**Sales and Loyalty**

Points	**SFT (30%)**	**Delivery Expenses (30%)**	**A/R (10%)**	**Gross Margin (30%)**	**COGS (70%)**	**Loyalty (30%)**
1	> 60	>60	>60	< 40	< 40	< 40
2	>40 & <=60	>40 & <=60	>40 & <=60	>= 40 & < 60	>=40 & < 60	>=40 & < 60
3	>20 & <=40	>20 & <=40	>20 & <=40	>= 60 & < 80	>= 60 & < 80	>= 60 & < 80
4	<= 20	<=20	<= 20	>= 80	>= 80	>= 80

Table 3.3.1: Customer Stratification Guidelines

The summary from the results of customer stratification are presented in Table 3.3.2. Based on the summary of customer stratification, we infer that the marginal customers take about 70 percent of the SFT, which is prohibitively high. Customers 1, 3, 5, and 7 were identified as marginal customers.

Current	Customers	Sales Force Hours	CTS-delivery	A/R	Gross Margin	COGS
Core	1	11,771	$ 425,297	$ 5,706,405	$ 3,170,225	$ 79,255.63
Opportunistic	1	6,365	$ 449,526	$ 4,559,240	$ 2,849,525	$ 27,138.33
Service Drain	3	44,419	$ 838,585	$ 8,003,621	$ 5,845,185	$ 110,800.95
Marginal	4	144,731	$ 745,314	$ 6,559,358	$ 6,800,620	$ 110,026.78
Total	**9**	**207,286**	**$ 2,458,722**	**$ 24,828,624**	**$ 18,665,555**	**$ 327,221.69**

Table 3.3.2: Summary of the Results of Customer Stratification

Next, we recommend to the management the following measures to improve the profitability of the marginal customers. The first measure is to reduce the A/R by 50% for each marginal customer. Next, we propose a reduction in the delivery frequency by increasing the order quantity, so that, the delivery cost to serve is reduced by 50% for each marginal customer. However, based on the feedback from the sales team, the marginal customer with the least gross margin (Customer 7) is expected not to increase the order size. For this customer, the distributor will have to levy an additional charge equal to 50% of the CTS-delivery, to increase the gross margin. Furthermore, the customer with the least loyalty (customer 5) was expected to discontinue buying if management implements the proposed measures. We compute the expected A/R, GM and CTS for the proposed measures as shown in Table 3.3.3.

Customers	A/R # 2	GM # 2	CTS# 2
c1	$ 1,033,050.0	$ 2,582,625.0	
c2	$ 4,559,240.0	$ 2,849,525.0	$ 449,526
c3	$ 889,506.0	$ 1,482,510.0	
c4	$ 2,278,312.0	$ 1,423,945.0	$ 245,345
c5	$ 315,661.0	$ 1,578,305.0	
c6	$ 5,706,405.0	$ 3,170,225.0	$ 425,297
c7	$ 1,041,462.0	$ 1,246,756.0	
c8	$ 637,978.0	$ 1,594,945	$ 273,714
c9	$ 5,087,331.0	$ 2,826,295	$ 319,526
TOTAL	$ 21,548,945.0	$ 18,755,131.0	$ 1,713,408.0

Table 3.3.3: Reducing A/R, GM, and CTS

Since customer 5 is expected to discontinue purchases from the distributor, we anticipate a significant amount of the sales force time (SFT) relieved. We propose to redeploy the recovered SFT to increase sales from opportunistic customers. Based on the sales team's feedback, if all the sales force time is redeployed to serve multiple locations of the opportunistic customers, the sales volume is expected to increase by 100%. The CTS is expected to increase by 35%, the accounts receivables is expected to increase by 50%, and the gross margin as well as the COGS is expected to double the current value. The expected values for this scenario are shown in Table 3.3.4.

Customers	Hours# 3	CTS# 3	A/R # 3	COGS# 3	GM# 3
c1	37265	$ 203,945.00	$ 1,033,050.00	$ 32,282.81	$ 2,582,625.00
c2	50863	$ 606,860.10	$ 6,838,860.00	$ 54,276.66	$ 5,699,050.00
c3	28715	$ 39,216.50	$ 889,506.00	$ 29,650.20	$ 1,482,510.00
c4	16233	$ 245,345.00	$ 2,278,312.00	$ 35,598.63	$ 1,423,945.00
c5					
c6	11771	$ 425,297.00	$ 5,706,405.00	$ 79,255.63	$ 3,170,225.00
c7	34253	$ 179,152.00	$ 1,041,462.00	$ 33,062.29	$ 1,246,756.00
c8	12481	$ 273,714.00	$ 637,978.00	$ 39,873.63	$ 1,594,945.00
c9	15705	$ 319,526.00	$ 5,087,331.00	$ 35,328.69	$ 2,826,295.00
TOTAL	207286	$ 2,293,055.60	$ 23,512,904.00	$ 339,328.54	$ 20,026,351.00

Table 3.3.4: Expected Values due to the Implemented Measures

The following Table illustrates the summary of the expected values because of customer C5 discontinuing their purchase from the distributor.

Because of c5 leaving	
NEW FIGURES	
new a/r	$ 23,512,904.00
new gm:	$ 20,026,351.00
new cogs:	$ 339,328.54
new revenue	$ 20,365,679.54
new cogs	$ 339,328.54
new operating exp.	$ 1,713,408.00
new cog/old cog	1.036998923

Table 3.3.5: The Summary of Customer 5 Leaving: New Expected Totals

Similar to inventory and supplier stratification cases, to determine the profitability of the proposed strategy, the current and expected GM is calculated and compared. However, based on the results

shown in the table below we cannot make a clear decision solely based off of the GM, we need to calculate the EBITDA values to provide a clear understanding if the proposed strategy is successful, since GM does not include the operating expenses.

Current GM	$	18,665,555.00
Expected GM	$	20,026,351.0
Expected GM Increase	$	1,360,796.00

Table 3.3.6: Current and Expected Gross Margin

Next, we compare the current and expected EBITDA margins by taking into account the operating expenses incurred by the distributor, as seen in Table 3.3.7. Based on the COGS presented in Table 3.3.5, we infer that expected COGS increases by a factor of approximately 1.037. Using this incremental factor, we compute the variable expenses and the total operating expenses as shown in Table 3.3.7.

Operational expenses	Amount	Variable Component	Variable	Fixed	Expected Variable	Expected Amount
Employee Compensation (Sales)	$ 3,467,520.00	0.9	$3,120,768.00	$ 346,752.00	$3,236,233.05	$ 3,582,985.05
Employee Compensation (Others)	$ 4,458,240.00	0.1	$ 445,824.00	$4,012,416.00	$ 462,319.01	$ 4,474,735.01
Warehouse Expenses	$ 1,491,033.60	0.7	$1,043,723.52	$ 447,310.08	$1,082,340.17	$ 1,529,650.25
Delivery Expenses	$ 2,458,722.00		$ -		$ -	$ 2,293,055.60
Other Expenses	$ 3,398,169.60	0.2	$ 679,633.92	$2,718,535.68	$ 704,779.64	$ 3,423,315.32
Total	$15,273,685.20		-	-	-	$15,303,741.23

Table 3.3.7: Expected Variable and Total Operating Expenses

Next, we calculate the EBITDA by subtracting the operating expense from the gross margin, as presented in Table 3.3.8. Therefore, the current EBITDA is $3,391,869.80 and the expected EBITDA is $4,722,609.77. The improvement in EBITDA due to the new strategy is positive, and hence, the proposed strategy is profitable.

	Current	Expected
Operating Expenses	$ 15,273,685.20	$ 15,303,741.23
Gross Margin	$ 18,665,555.00	$ 20,026,351.00
EBITDA	$ 3,391,869.80	$ 4,722,609.77
EBITDA IMPROVEMENT	$ 1,330,739.97	

Table 3.3.8: EBITDA Current and Expected

We then compute the RONA, based on the following current balance sheet elements. The current and expected values of the balance sheet elements are computed in Table 3.3.9.

Current Balance Sheet Elements	Current	Expected
A/R	$ 24,828,624.00	$ 23,512,904.00
Cash & Securities	$ 2,361,304.82	$ 2,361,304.82
Inventory	$ 24,419.53	$ 25,323.03
Other Current Assets	$ 2,243,239.58	$ 2,243,239.58
Fixed and Non-Current Assets	$ 7,083,914.46	$ 7,083,914.46
Total assets	$ 36,541,502.39	$ 35,226,685.89
Notes Payable	$ 1,180,652.41	$ 1,180,652.41
A/P	$ 13,447.47	$ 13,945.01
Other Curr. Liab.	$ 421,661.58	$ 421,661.58
Non-current Liab. & Debt	$ 1,534,848.13	$ 1,534,848.13
Total liabilities	$ 3,150,609.59	$ 3,151,107.13
EBITDA	$ 3,391,869.80	$ 4,722,609.77
Net Assets	$ 33,390,892.80	$ 32,075,578.76
RONA	0.101580686	0.147233813

Table 3.3.9: Return on Net Assets (RONA)

We observe that the current RONA is 10.16%, whereas the expected RONA is 14.72%. Thus, the proposed strategy has higher asset efficiency.

3. CONCLUSIONS

The main goal of this project is to provide managerial recommendations for Hisco, Inc. to help improve its financial performance by evaluating the company's inventory, suppliers and customers. For the inventory management, we evaluated a strategy of reducing or eliminating non-performing inventory, paying back long-term debts, and re-investment in well-

performing assets. We performed the inventory stratification on 100 products to identify the most profitable and non-profitable products, which was done based on three dimensions: sales revenue, sales hits, and gross margin return on inventory investment. After performing the inventory stratification by evaluating the current and expected inventory levels, in addition to the three financial measurements, gross margin, Earnings Before Interest Taxes Depreciation and Amortization (EBITDA), and Return on net assets (RONA), we were able justify better profitability and asset efficiency of the proposed strategy in comparison to the current situation.

Following inventory analysis, we then focused on the suppliers since they play a key role in the company's profit. In order to recommend a new strategy for suppliers, we searched for the best practice that describes supplier stratification. The best practice is multi-criteria based combination method that differentiates the profitable suppliers from the out-of-control suppliers. To do so, we have performed supplier stratification and classified the suppliers into four classes (strategic, vendor controlled, distributor controlled, out-of-control). Our recommendation is to effectively manage the out-of-control suppliers by increasing the Completeness Index (Quality) to 0.9 for the out-of-control suppliers though supplier programs. In addition, we recommend the reduction in the Distributor Services to 10% of the current value for each out-of-control supplier. Based on the financial analysis, we determined that the proposed strategy is expected to result in not only higher profitability but also increased asset efficiency.

Lastly, we performed customer stratification to identify core, opportunistic, service drain, and marginal customers. The sole concern was placed on the marginal customers, who do not provide a profitable business for the distributor. In order to improve the profitability of the marginal customers, we proposed a strategy that involved reducing the delivery frequency, which in turn reduces the delivery cost to serve. This strategy proved to be profitable and had a higher asset efficiency in terms of net assets.

For future research, we recommend development of a unified framework to simultaneously analyze the impact of process-level decisions pertaining to inventory, suppliers and customers on the financial metrics. Furthermore, the analysis can be extended to incorporate risks and uncertainty involved in the decision process.

Appendix 1.1 – Inventory Stratification

Product Line	Product Revenue	Cost of Goods Sold	Inventory	Sales Hits
PL 1	$ 370,665	$ 277,257	$ 757,062	21,327
PL 2	$ 6,671,965	$ 4,990,629	$ 853,218	356,473
PL 3	$ 329,480	$ 246,451	$ 547,274	20,537
PL 4	$ 423,617	$ 316,865	$ 630,885	22,633
PL 5	$ 4,447,976	$ 3,327,086	$ 779,940	332,708
PL 6	$ 32,124,274	$ 24,028,957	$ 1,630,595	1,716,354
PL 7	$ 4,731,890	$ 3,539,454	$ 856,405	235,963
PL 8	$ 348,861	$ 260,948	$ 582,355	21,745
PL 9	$ 34,418,865	$ 25,745,311	$ 1,845,957	2,340,482
PL 10	$ 395,376	$ 295,741	$ 688,238	24,645
PL 11	$ 6,843,041	$ 5,118,594	$ 873,533	393,738
PL 12	$ 7,135,791	$ 5,337,572	$ 991,578	533,757
PL 13	$ 502,596	$ 375,942	$ 783,168	26,852
PL 14	$ 470,685	$ 352,073	$ 454,237	29,339
PL 15	$ 4,538,751	$ 3,394,986	$ 970,592	308,635
PL 16	$ 29,829,683	$ 22,312,603	$ 1,415,234	1,593,757
PL 17	$ 4,633,309	$ 3,465,715	$ 1,015,736	231,047
PL 18	$ 124,038	$ 92,781	$ 99,153	8,434
PL 19	$ 6,037,062	$ 4,515,722	$ 950,509	410,520
PL 20	$ 3,887,956	$ 2,908,191	$ 744,992	193,879

Appendix 1.2 –Inventory Stratification Points

SDV Points (30%)	Sales Hits Points (20%)	GMROII Points (50%)	Aggregate points	Class
1	1	1	**1**	D
3	3	3	**3**	B
1	1	1	**1**	D
1	1	1	**1**	D
2	3	2	**2.2**	C
4	4	4	**4**	A
2	2	2	**2**	C
1	1	1	**1**	D
4	4	4	**4**	A
1	1	1	**1**	D
3	3	3	**3**	B
3	4	3	**3.2**	B
1	1	1	**1**	D
1	1	1	**1**	D
2	2	2	**2**	C
4	4	4	**4**	A
2	2	2	**2**	C
1	1	1	**1**	D
3	3	3	**3**	B
2	2	2	**2**	C

Appendix 2.1 – Supplier Stratification

Suppliers	Completeness Index (Quality)	Distributor Services	Accounts Payable	Gross Margin	Sales Revenue	Exclusivity
S1	0.93	$35,068	$66,260	$177,818	$883,461.00	1
S2	0.99	$40,102	$34,456	$161,688	$626,480.00	0.13
S3	0.9	$32,900	$24,386	$166,782	$696,752.00	0.25
S4	0.66	$479,944	$39,126	$45,391	$601,940.00	0.14
S5	0.98	$25,432	$25,328	$105,690	$723,669.00	0.5
S6	0.96	$49,359	$38,421	$111,021	$698,555.00	0.2
S7	0.96	$29,302	$47,830	$153,053	$683,288.00	0.33
S8	0.7	$393,581	$33,746	$41,813	$613,561.00	0.14
S9	0.97	$43,448	$41,618	$174,153	$693,641.00	0.17
S10	0.93	$9,275	$50,311	$215,803	$774,023.00	1

Appendix 2.2 – Supplier Stratification Points

CI Points	A/P Points	Exclusivity Points	DS Points	GM Points	Performance & Exclusivity	Services & Profitability	Ranking
3	4	4	2	4	3.3	3.2	Strategic
4	1	2	2	2	3.3	2.0	Vendor Controlled
3	1	3	3	3	2.8	3.0	Strategic
1	2	2	1	1	1.3	1.0	Out of Control
4	1	4	4	1	3.7	2.2	Vendor Controlled
4	2	2	1	1	3.4	1.0	Vendor Controlled
4	3	3	3	2	3.7	2.4	Vendor Controlled
1	1	2	1	1	1.2	1.0	Out of Control
4	3	2	1	3	3.5	2.2	Vendor Controlled
3	4	4	4	4	3.3	4.0	Strategic

Appendix 3.1 – Customer Stratification

Customers	Sales Force Hours	CTS-delivery	Accounts Receivables	Gross Margin	Cost of Goods Sold	Loyalty
C1	37,265	407,890	2,066,100	2,582,625	32,282.81	4
C2	6,365	449,526	4,559,240	2,849,525	27,138.33	5
C3	28,715	78,433	1,779,012	1,482,510	29,650.20	6
C4	16,233	245,345	2,278,312	1,423,945	35,598.63	9
C5	44,498	79,839	631,322	1,578,305	15,031.48	0
C6	11,771	425,297	5,706,405	3,170,225	79,255.63	2
C7	34,253	179,152	2,082,924	1,157,180	33,062.29	2
C8	12,481	273,714	637,978	1,594,945	39,873.63	4
C9	15,705	319,526	5,087,331	2,826,295	35,328.69	10

Appendix 3.2 – Customer Stratification Points

Customers	Sales Force Hours	CTS-delivery	A/R	Gross Margin	COGS	Loyalty	CTS and Margin	Sales and Loyalty	Type
C1	1	1	3	3	1	2	1.8	1.3	Marginal
C2	4	1	1	4	1	3	2.8	1.6	Opportunistic
C3	1	4	3	1	1	3	2.1	1.6	Marginal
C4	2	3	1	1	3	4	1.9	3.3	Service Drain
C5	1	4	4	1	1	1	2.2	1	Marginal
C6	4	1	1	4	4	1	2.8	3.1	Core
C7	1	3	2	1	2	1	1.7	1.7	Marginal
C8	3	2	4	2	4	2	2.5	3.4	Service Drain
C9	3	1	1	3	3	4	2.2	3.3	Service Drain

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Portrayals of Psychotherapy and Psychotherapists in Popular Cinema

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Abstract: *Portrayals of psychotherapy in movies can contribute to misinformation about treatment of emotional and behavioral problems. This study investigated sources of misinformation with reference to the negative and often caricatured portrayals of therapists in movies and portrayals of unethical and unprofessional practices in therapist-client interactions. Contemporary movies were viewed and coded for the presence of therapist stereotypes and boundary violations/crossings in scenes depicting therapy. Boundary violations are unethical practices that occur during therapy that have the potential to harm or exploit the client. Examples are sexual relationships with clients and confidentiality breaches of client information. Boundary crossings are deviations from established therapeutic processes that could potentially be harmful to the client depending on the situation. Nonsexual touch, therapist self-disclosure, dual relationships, and out-of-office experiences with clients are examples of boundary crossings. Results showed that contemporary movies often portray therapists in stereotypical and negative ways and depict numerous unethical and unprofessional events in therapist-client interactions. The most frequent therapist stereotype was the therapist who engaged in sexual relationships with a client or a person related to the client. The most frequent boundary violation was confidentiality breaches, and the most frequent boundary crossings were non-sexual touch, out-of-office experiences, and dual relationships. These misrepresentations of therapist and therapy processes often go unnoticed and may help reinforce public misperceptions about therapists and psychotherapy processes.*

Psychotherapy is defined as the treatment of emotional or behavioral problems through the establishment of a professional relationship between a client and a mental health provider (Peterson, 2008). Providers of psychotherapy may include among others counselors, social workers, psychiatrists, and psychologists. The roles of these providers may differ as a function of their profession, and therapists can differ as to theoretical beliefs, level and type of training, and preferred therapy techniques. Regardless of differences, all legitimate mental health providers receive advanced education and training in their area of specialization and provide services in accord with state law and the code of ethics of their respective credentialing organizations.

In the United States, psychotherapy services are found in a number of diverse settings, including private practice, schools, prisons, hospitals and clinics, and businesses. Almost one-third of Americans seek psychotherapy services each year (Olfson & Marcus, 2010) with most receiving therapy for major depression, anxiety, and personality disorders (Mojtabai & Olfson, 2008). Despite the pervasiveness of psychotherapy in American society, the

public at large is misinformed about the process of psychotherapy and the roles of psychotherapy providers. Common myths held by those with little experience with psychotherapy include the belief that therapists just listen to clients vent, that therapists blame all of their clients' problems on parents or childhood experiences, that psychotherapy lasts for many years or for a lifetime (American Psychological Association, 2012) and that seldom-practiced psychoanalytic techniques (e.g., dream interpretation and free association) are prominently used in psychotherapy (Furnham, 2009). The general public also shows a lack of understanding about roles and responsibilities of the different types of mental health providers and appears unable to distinguish among types of providers and the services they provide (Ackerman, Wantz, Firmin Poindexter & Pujara, 2012; Orchowski, Spickard, & McNamara, 2006). Kiesler (1966), for example, found that people are more likely to believe that all mental health providers are the same, a belief he coined the "therapist uniformity assumption."

Origins of this misinformation about process and therapists can be traced in part to media, which has been noted to exert a powerful influence on the public perception about mental health providers and mental health treatment practices (Gharaibeh, 2005; Jorm, 2000). Popular movies, in particular, are cited as key contributors to stereotypic and largely negative perceptions of psychotherapists (Gabbard, 2001). In studies of cinematic portrayals of mental health providers, a number of therapist stereotypes have been identified. Schneider (1987) identified three typologies of psychotherapists often portrayed in movies released prior to the 1980s. These typologies ranged from positives stereotypes such as "Dr. Wonderful," who is seen as the caring and competent therapist, to negative stereotypes like "Dr. Evil," who is portrayed as dangerous, corrupt, and manipulative, and "Dr. Dippy," who is portrayed as crazier as and more idiosyncratic than the client and is usually not meant to be taken seriously (Sleek, 1998). Additional stereotypes such as "Dr. Romantic" and "Dr. Wounded/Flawed Healer" (Sleek, 1998; Young, 2012) have been added to the typologies. "Dr. Romantic" is the therapist who becomes sexually and/or romantically engaged with a client and "Dr. Wounded/Flawed Healer" refers to the therapist who has psychological issues which at some point interferes with therapy, and yet is caring and competent, and completely effective (Orchowski et al., 2006).

Movies also provide misinformation about the ethicality of psychotherapy by portraying unprofessional therapist/client interactions as commonplace, of minimal consequence, or even beneficial. Gabbard (2005) categorizes these interactions as boundary violations and boundary crossings. Boundary violations are defined as potentially harmful transgressions of appropriate professional behavior between the therapist and client (Gabbard, 2005) and include breaches of client confidentiality and therapist sexual misconduct with a client. A confidentiality breach is a failure by the therapist to protect a client's confidential information. Confidential information may only be disclosed with the informed consent of the client with the exception of client threats to harm others or self. Sexual activity with clients (or with relatives or significant others of clients) is unethical and a clear violation of boundaries (Borys & Pope, 1989; Bouhoutsos, Holroyd, Lerman, Forer, & Greenberg, 1983). Many professional organizations also prohibit

future sexual activity with former clients or establish a two year wait period following the termination of therapy (APA, 2002).

Boundary crossings are distinct from boundary violations and are defined as momentary, non-exploitative events that occur during psychotherapy and that deviate from the usual boundaries characterizing therapeutic activity (Peterson, 2008). Boundary crossings have the potential to cross a professional boundary or, as Lott (1999) states, place the professional relationship on a slippery slope that can lead to client exploitation. Examples of boundary crossings include non-sexual touch, therapist self-disclosure, dual relationships, and out-of-office experiences (Gutheil & Gabbard, 1993).

Whether boundary crossing events have the potential to be exploitive is subject to interpretation as these events are highly context-dependent. The appropriateness of non-sexual touch between a therapist and a client in therapy, for example, is controversial. While some professionals believe that any touch other than a client-initiated handshake is a potentially harmful boundary crossing (Gutheil & Gabbard, 1993), others (Zur & Nordmarken, 2011) distinguish between supportive touch that can facilitate therapy and aggressive touch which can harm the therapeutic process. As Zur (2001) notes, touch in therapy can be tricky, as the contextual nature of touch is difficult to disambiguate.

Therapist self-disclosure within a therapeutic setting is also controversial. Some (Hill & Knox, 2002) recommend avoiding any kind of statement that reveals any personal information about the therapist as personal disclosures can move the focus of the therapy away from the client to the therapist or can make the client feel burdened or uncomfortable. Knox (2003), however, believes that therapist self-disclosure can facilitate client's openness, trust, intimacy, and enhance the therapeutic bond. Similar to therapist's self-disclosure in the therapy process, the ethicality of out-of-office experiences can be difficult to determine. Out-of-office experiences (Zur, 2001) include conducting therapy in settings other than an office (e.g., in the client's home) and having contact with a client in a non-therapeutic setting (e.g., visiting a client in a hospital). Whether out-of-office experiences should be permitted as a part of therapy is a subject of debate. Pope and Keith-Spiegel (2008) claim that it is a major misconception to believe that contacts with clients outside of the formal therapy setting have no effect on the therapy process. Attending a client's special event, they contend, might make the client feel uncomfortable as personal space may be perceived as being invaded. Lott (1999) states a client might confuse the therapist's presence in non-therapy settings to mean something more than it really is. However, Lott also states that attending a client's special event might show support and care to the client and notes that as situations differ, out-of-office experiences may be appropriate if carefully considered and guided by what is in the client's best interest. Zur (2001), an advocate of out-of-office experiences, contends that these experiences may be ethical, effective, and facilitative of client progress.

Another boundary crossing concerns non-sexual dual relationships that occur when the therapist and the client are involved in both a professional therapeutic relationship and another type of non-therapeutic relationships. Examples of dual relationships include going into business with a client, providing therapy to a friend, and having a client who is also a student. The ethics codes of many professional organizations prohibit dual

relationships as these relationships can impair the objectivity and effectiveness of the therapist and raise the risk of exploitation or harm to the client (Kagle & Giebelhausen, 1994). However, as with other boundary crossings, dual relationships can be context dependent and accordingly could be beneficial to clients. Pope (1991) states that in some cases, dual relationships can actually be beneficial to clients as the therapeutic alliance is strengthened.

To what extent do contemporary popular movies feature boundary violations and boundary crossings in portrayals of psychotherapy? Gharaibeh (2005) investigated boundary issues in 106 movies and found almost one-fourth (24 %) of cinematic therapists violated sexual boundaries and 30% violated other boundaries, which were not specified. Other than Gharaibeh's study, the investigation of ethical and professional issues in movies depicting psychotherapy has received scant research attention. This is surprising given the extent and nature of public misinformation about therapists' roles and about the process of therapy. The purpose of this study is to analyze the content contemporary popular movies as to how therapists and psychotherapy are with reference to ethical and professional boundaries.

Method

Sample

English-language commercial movies that were released commercially between 1990 and 2013 and that featured at least one scene with psychotherapy were viewed in their entirety. Sources for locating movies were Internet databases that allowed a search by topic or keyword. They included the Internet Movie database (IMDb), Netflix, Yahoo! Movies, Ranker, All movie, and numerous other movie anthologies available online or in print. Keyword search terms were "psychotherapy," "therapy," "therapist," "psychotherapist," "psychologist," and "psychiatrist," and "mental health." Movies available for rent, purchase, or online viewing were viewed if the database's description referred to a character or plot characterized by any of these terms. Movies were included in the content analysis if at least one scene portrayed an adult character receiving out-patient therapy from a therapist. Movies were excluded if the therapy scene involved an inpatient, forensic, or group therapy setting.

Coding

A coding checklist for therapist type and therapy boundary violations and crossings was devised. Each movie scene meeting the selection criteria for psychotherapy was coded on each of the following variables:

Therapist typologies. Based on prior research typologies of movie therapists, therapists appearing in the movies was categorized into one of the five stereotypes as follows: a) "Dr. Dippy," a therapist portrayed as quirky, odd, or eccentric; b) "Dr. Evil," a therapist who was manipulative, corrupt, or abusive; c) "Dr. Wonderful," a therapist who was extraordinarily caring, dedicated, and competent, and considered the client the main priority; d) "Dr. Wounded/Flawed Healer," who has the same characteristics as "Dr. Wonderful," but also has personal problems which interfered or affected the therapy at some point; and, e) "Dr. Romantic," a therapist engaged in a romantic or sexual relationship with a client or someone related to the client.

*Boundary violations and boundary crossings***.** Boundary violations and boundary crossings were coded if they appeared in any of therapist-client scenes in the movies. Breaches of confidentiality and

sexual relationships with clients constituted the boundary violations. Breaches of confidentiality were defined as failure of the therapist to protect confidential information about the client. A sexual relationship was defined as the therapist allowing or initiating physical contact with a client of any sexual nature, up to two years after therapy termination. The boundary crossings that were coded included nonsexual touch, therapist self-disclosure, nonsexual dual relationships, and outside-of-office events. Nonsexual touch-was segmented into two parts, supportive touch and aggressive touch. Supportive touch was defined as any physical contact of non-sexual nature allowed or begun by the therapist, intended to strengthen the professional relationship between the client and the therapist or comfort a panicked patient (Zur & Nordmarken, 2004). Aggressive touch was then defined as any physical contact of non-sexual nature allowed or begun by the therapist, intended to hurt, injure, or manipulate the client (Zur & Nordmarken, 2004). Therapist self-disclosure was coded as inappropriate if the therapist revealed personal information judged to be not pertinent to the therapy and appropriate if the information revealed facilitated therapy. Dual relationships were defined as the therapist maintaining a non-sexual second role (e.g., social, business, professional) with the client, while at the same time maintaining the therapist/client relationship. Out-of-office experiences were defined as appropriate if the experience was judged to be part of the therapeutic plan with anticipated benefit to the client and inappropriate if the experience was not part of the therapy and had no anticipated benefit for the client.

Results

A total of 44 movies were analyzed to ascertain how therapists and therapy are portrayed in reference to ethical and professional boundaries. Of these movies, 29 met criteria of depicting outpatient psychotherapy with at least one adult client. In the analysis of therapist stereotypes, the frequency of each of the five different therapist stereotypes was tabulated. The majority (n=23; 79%) of the 29 movies displayed at least one of the stereotypes. As shown in Table 1, the most frequent stereotype was “Dr. Romantic,” who characterized 35% (n= 11) of fictional therapists, followed by “Dr. Dippy” with 28% (n= 8). The stereotypes “Dr. Wonderful,” and “Dr. Wounded/Flawed Healer” occurred in 10% (n=3) of the movies and “Dr. Evil” occurred only once in the movies. An unexpected finding concerned therapists who were portrayed as being forced or threatened into the professional relationship and therapists who crossed lines that were non-sexual during the therapy relationship. These types were labeled as “Dr. Reluctant” and “Dr. Line-Crosser” and each occurred in three movies.

Table 1

Frequency of Fictional Psychotherapist Stereotypes

Stereotypes	Frequency	
	N	%
Dr. Dippy	8	28
Dr. Wonderful	3	10

Dr. Evil	1	3
Dr. Romantic	11	38
Dr. Wounded/Flawed Healer	3	10
Dr. Reluctant	3	10
Dr. Line-Crosser	3	10

In the analysis of portrayals of ethical and professional issues in therapy, the frequency of two boundary violations, sexual relationships, and confidentiality breaches, were examined. As shown in Table 2, the therapists violated the client's confidentiality in 41% (n=12) of the movies. The most frequent violations involved confidentiality breaches involving disclosure of clients' information to friends and family members who were not involved in the therapy and failure to protect privacy of therapy sessions. More than a third (35%; n=10) of the movies portrayed therapists as engaged in a sexual relationship with a client or someone related to the client. Of these, 63% (n=7) of the therapists were portrayed as women. The majority of these movies involved sexual contact with ongoing clients while two of the movies involved a sexual relationship starting after therapy ended.

The boundary crossings of non-sexual touch, self-disclosure, non-sexual dual relationships, and out-of-office experiences in movies were tabulated as to frequency. More than one third (35%; n=10) of the movies portrayed a therapist engaging in non-sexual touch with the client. Supportive touch, exemplified by hugging an emotional patient or providing a reassuring pat on the shoulder, occurred in the majority (78%; n=7) of the movies. A few movies (30%; n=3) depicted aggressive touch, exemplified by *Good Will Hunting*, *Analyze*, and *Prince of Tides*. Therapist self-disclosure occurred in 21% (n=6) of the movies with one judged (17%; n=1) as appropriate and five (83%; n=5) judged as inappropriate. Dual relationships occurred in 31% (n= 9) of the movies. Three (33%; n=3) of the dual relationships were business-related and involved offering a job to the client and entering a joint business venture and seven (78%; n= 7) of the movies depicted the therapist engaging in a social relationship with a friend or relative of a client. In over a third (35%) of the movies, the therapist engaged in an out-of-office experience with the client. Almost half (40%; n=4) were tabulated as appropriate as the experience was judged to be part of the therapeutic plan and facilitative of therapy (e.g., attending a client's graduation ceremony; attending the funeral of a client's loved one). The other 60% (n=5) of the out-of-office experiences were tabulated as inappropriate as the events were judged to not be part of the therapeutic plan, and have no anticipated benefit to the client (*Final Analysis* and *Side Effects*). In all instances, the client was grateful for the therapist's presence, and the attendance helped increase trust and reliability between the therapist and the client. Frequencies of each of the boundary crossings are shown in Table 2.

Table 2

Frequencies of boundary violations and boundary crossings

Boundaries	Frequencies	
	N	%
Sexual Relationships	10	35
Confidentiality Breaches	12	41
Non-Sexual Touch	10	35
Self-Disclosure	6	21
Dual Relationships	9	31
Out-of-office experiences	10	35
Unprofessional Conduct	18	62

Discussion

The purpose of this study was to ascertain how therapists are portrayed in contemporary popular movies and how therapy is portrayed in reference to ethical and professional codes of conduct. In the content analysis of the 29 movies the most prevalent therapist stereotype was that of "Dr. Romantic," the therapist who becomes sexually involved with a client or a person related to a client. Two interesting observations were noted about the "Dr. Romantic" stereotype. First, the sexual relationships of "Dr. Romantics" did not lead to negative consequences; rather the sexual relationships in many movies the sexual relationships helped cure the client. Second, of the movie therapists who became sexually involved, all but one was portrayed as female. Reasons for these portrayals are unclear, though it may be due to the interests of movie script writers and directors who believe that "sex sells." Or perhaps it may be due to the belief that women (whether professional or not) are less able to control their sexual desires.

The second most common stereotype portrayed in the movies was "Dr. Dippy," the therapist who rarely is taken seriously and who provides comic relief. As indicated by Sleek (1998), movies often caricaturize therapists for comedic and dramatic impact. The other stereotypes of "Dr. Wonderful," "Dr. Wounded/Flawed Healer," and "Dr. Evil" infrequently occurred in this study, suggesting that these stereotypes are disappearing. However it should be noted that movies depicting therapy conducted in inpatient or forensic settings were not examined in this study, and it could be that some stereotypes such as "Dr. Evil" might appear more frequently.

With reference to ethical and professional boundary issues characterizing therapeutic interactions in movies, nearly all of the movies portrayed some type of boundary violation or boundary crossing. Failure to maintain client confidentiality was the most common violation, followed by engagement in sexual relationships with clients. Failure to protect client confidentiality is a clear boundary violation and therapists who violate confidentiality are censured by professional organizations. It was surprising then to note that all of the movies but one depicting this violation showed no negative consequences to either therapist or client. As an example, in *Side Effects*, the therapist's open discussion about his client with another therapist in front of strangers accrues no adverse consequence. The second most common violation was therapist engagement in a sexual relationship with either the client or a person related to the client. As with violations of confidentiality, the movies failed to show any harmful or exploitive effects to the therapy process. In fact, in many of the movies, the client was cured despite the relationship, and in two of the movies (*Prince of Tides and Tin Cup*) the client was cured because of the relationship. Interestingly, in the majority of the movies that depicted a sexual relationship, the therapist stated that sexual involvement was ethically wrong but yet still engaged in sexual relationship.

The most frequent boundary crossings observed in the movies were non-sexual touch, dual relationships, out-of-office experiences, and to a lesser extent, therapist self-disclosure. Although considered a boundary crossing, in many cases non-sexual touch was judged as therapeutically appropriate. As an example, the hug given to the troubled client in *Antwone Fisher* is judged as supportive and beneficial to the client. However, in some movies, touch was clearly aggressive and inappropriate as exemplified by the therapist choking his client in *Good Will Hunting*. Similar to touch, the out-of-office experiences were judged to be both appropriate and inappropriate. Appropriate out-of-office experiences included attending a funeral with a client (*Lars and the Real Girl*) and visiting a client post-surgery (*50/50*). Inappropriate experiences included going out to eat with a client (*Prince of Tides*) and visiting a client's home for non-therapy reasons (*Numb*). Many of the movies featured dual relationships between therapist and client and many of these involved friendships and, to a lesser extent, joint business ventures. Almost all of the relationships were portrayed positively and ultimately proved beneficial to client. In *Shrink*, for example, "Dr. Wounded Healer" and the client entered a dual relationship that allowed the client to deal with a parent's suicide. In *The Wackness*, as a result of a business venture between "Dr. Dippy" and his client, the client decides to no longer sell drugs and enroll in college. Therapist self-disclosure was also observed in some movies. Unlike the aforementioned boundary crossings, the majority of incidences of self-disclosure were judged as inappropriate as the therapist revealed personal information that was of benefit to the therapist and not the client. In *Tin Cup*, for example, the therapist discloses information to her client about anxieties about her sex life. Again, as with other boundary crossings, therapist self-disclosure did not result in any negative effects to the therapeutic process.

In addition to the numerous boundary crossings identified in popular movies, more than half of the psychotherapy scenes in the movie analysis depicted frequent occurrences of unprofessional

conduct which was defined as improper or unseemly therapist behaviors. Though these behaviors do not appear on checklists of boundary violation or crossings (Epstein & Simon, 1990; Lott, 1999), they nonetheless have the potential to be offensive, exploitive, and harmful to the client and can cause the client to question the seriousness and competence of the therapist. Examples of unprofessional conduct observed in this movie sample included the therapist yelling, crying, or blaming the client, the therapist sleeping during therapy, and the therapist throwing objects at the client.

In summary, the majority of boundary violations and crossings identified in contemporary popular movies were depicted as commonplace, benign, and acceptable with no negative consequence to the therapist, client, or therapeutic process. Hence statements made by Gabbard (2001) and Young (2012) that the origins of misinformation about psychotherapy and therapists can be traced to the influence of movies are provocative. In the light of limited experience with psychotherapy, it is understandable how people would likely believe myths about psychotherapy and therapists if they watch movies that misrepresent therapy and therapists. It is not unreasonable to predict that a potential client might decide against therapy for fear of meeting a "Dr. Dippy" or fear of having confidentiality breached.

There are a few limitations of this study. First, inter-reliability checks were not performed on the dependent variables. Therefore, rater judgments of therapist stereotypes, boundary violations, and boundary crossings, were not assessed and could have impacted the results. Also due to time constraints, the sample size of 29 movies was small, which perhaps compromised generalizability of the results. Future research in this area would be strengthened not only by including more movies in the data set but by having trained mental health clinicians independently assess the dependent variables.

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Appendix

Films used to analyze portrayals of therapists and psychotherapy

Film	Year of Release
Analyze This	1999
Anger Management	2003
Antwone Fisher	2002
Anything Else	2003
Because I Said So	2007
Deconstructing Harry	1997
Exit in Red	1996
Fearless	1993
Final Analysis	1992
First Wives Club	1996
Good Will Hunting	1997
Grosse Pointe Blank	1997
Hollywood Ending	2002
Lantana	2001
Lars and the Real Girl	2007
No Reservations	2007
Numb	2007
Prime	2005
Prince of Tides	1991
Side Effects	2013
Silver Linings	2012
Shrink	2009

Stay	2005
Stranger than Fiction	2006
There’s Something About Mary	1998
The Wackness	2008
What About Bob?	1991
50/50	2011

The Effect of Monthly Alcohol Sales and Seasonal Variations on the Incidence of Violent Crime in Texas

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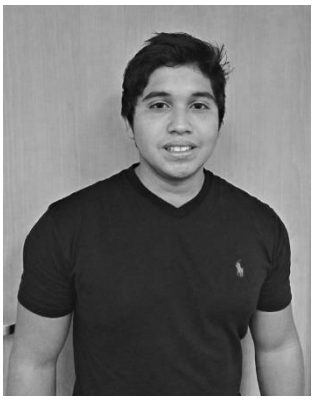

Abstract: *Violent crime is a major social problem in the state of Texas. There are many factors that influence a person to commit a violent offense. For this study, data is analyzed from the Texas Uniform Crime Reporting program and the Texas Alcohol Beverage Commission. In this study we analyze the effect of the amount of alcohol sold and its relationship to the number of aggravated assaults and murders in the state of Texas from 2005 to 2012. Also violent crime data is analyzed to see if these types of crimes vary by season of the year. The rationale behind this research is three fold. We wanted to see if the month of the year has an influence on alcohol sales, whether alcohol sales influence the number and rate of violent acts and whether or not there are seasonal variations in the number and rate of violent acts. Based on the data we find that monthly alcohol sales do seem to have a direct correlation on the number and rate of aggravated assaults and murders. Alcohol sales are the highest in the summer months of June, July and August. Corresponding to this observation we also find seasonal variation in the amount and rate of aggravated assaults and murders. Murders and aggravated assaults are more prevalent in the summer than in the spring, fall or winter. There are many factors that explain why each of these trends occur and why there is, to some extent, a relationship between these variables.*

Introduction

Serious predatory crimes get national media attention and appear daily on local and national television and newspaper outlets. These crimes can include murder, forcible rape, robbery, and aggravated assault. From analyzing annual data from victimization surveys and arrest data we can also study the trends of the different types of people that are victimized and/or arrested for these kinds of crimes.

The use of alcohol can have a negative impact on an individual's life and is a major factor in the incidence of violent behavior. In this paper, data will be analyzed to see if there is a relationship between the amount of monthly alcohol sales and the number and rate of violent crimes. Also we will analyze data to see if there is a correlation between seasons of the year and the number and rate of violent crimes.

Literature Review

Jones (2000) explains the incidence of violence in various societies. The author devotes a section of his book on why violence may occur. He cites, for example: biological influences, genetics, hormones, external factors, mental disorders, drugs and alcohol. The author makes sure to separate drugs and alcohol into different categories since each substance has a different effect on an individual. Alcohol has historically been known to "loosen" moral restraints which results in an individual to lose control and act in an anti-social way which sometimes includes violent behavior. When

research on the relationship between alcohol and violence was first established, researchers felt that since alcohol has a psychological effect on the brain that this loosens inhibitions which may, in some people, to engage in violent behavior. However more recent findings suggest that this is not as apparent as researchers thought it was. However there is overwhelming empirical evidence that suggests that violent offenders had been drinking at the time of their criminal offence. Collins (1986) concludes that inmates with an alcohol abuse problem tend to commit more assaults than non alcoholic inmates. Rada (1975) also notes that half of his study sample of convicted rapists had been consuming alcohol at the time of their act. In a study based in Sweden Lindqvist (1986) discovered that two thirds of murder offenders were drinking alcohol prior to committing murder. The U.S Department of Justice (1990) conducted a survey which found that 64% of state prisoners that were convicted of a violent crime admitted that they, their victims, of both of them were under the influence of alcohol at the time of the crime. The National Bureau of Economic Research discovered that there is a relationship between the consumption of alcohol and the number of spousal assaults in many states in the U.S. (Markowitz, 1999). Jones (2000) suggests that Americans tend to consume large quantities of alcohol in a short period of time. This may influence that the tendency towards violent behavior. French citizens tend to spread out their alcohol consumption throughout the day. France has one of the lowest rates of violence of any post industrial nation.

Unlike the research on the effects of alcohol on crime there is little research on violent crime and seasonal variations. A study by Anderson (2009) describes the heat hypothesis which states that hot temperatures can influence violent intentions by changing a person's behavior. Hot temperatures can increase aggression directly by increasing the emotion of anger and aggression which can incidentally change how a person thinking patterns change into aggressive thoughts. Anderson (2009, p.) states that "results have shown that global warming trends may well increase violent crime rates". It goes further into detail as it describes how more comfortable temperatures in institutional settings, such as schools, prisons, and workplaces, can decrease violent related problems in these particular settings. Data over the years have shown that violent crime rates are higher in the south than any other region in America. The cities in the south with a hotter climate were more prone to have higher violent crime rates than cities with cooler climates. However, there is still some doubt as to whether hot temperatures is the main reason for violence in the southern cities. Nevertheless there is still some data that show that there is an increase in assaults, rapes, and domestic violence in hot climate environments (Anderson el al., 2000; Anderson, 2009).

A recent study by Lauritsen & White (2014) describes the relationship between criminal behavior and season of the year. Analyzing national victimization data the authors suggest that some factors that may lead to criminal behavior in relation to different seasons are environmental factors. These include temperature rates and changes, daylight savings time, and different routines performed within each season. It is noted in this study that rape, sexual assault, and aggravated assault rates are the highest in the summer. There is a 3% difference in the violent crime rate between summer and fall, the second highest season. Also there is a 4% difference in the aggravated assault rate between summer and fall.

Hypotheses

The hypotheses for this study are as follows:

Hypothesis 1:
If the alcohol sales increase in a certain month, then the murder rates will increase.
Hypothesis 2:
If the alcohol sales increase in a certain month, then the aggravated assault rates will increase.
Hypothesis 3:
Seasonal variations will affect the murder and aggravated assault rates of violent crime. The summer months (June, July, and August) will have the highest amount of violent crime incidents as well as the violent crime rate.
Rationale:
Alcohol is a major factor which can influence people's tendencies towards engaging in violent crime. The summer months will see the highest with occurrences of violent crimes due to the very hot weather in Texas and coupled with various outdoor events that occur throughout the summer months. These events usually include the consumption of large quantities of alcohol.

Methodology & Procedure

As far back as 1930, the Federal Bureau Investigation has been collecting data through their Uniform Crime Reporting Program (UCR). The UCR program collects data from law enforcement agencies across the United States. These agencies report the number of arrests they have made. The UCR collects arrest data used by law enforcement agencies and researchers in the fields of criminal justice and criminology. The state of Texas has its own annual publication entitled "*The Texas UCR Program*" that was created on January 1, 1976. The Department of Public Safety assumed the duties of collecting arrest data from all the different law enforcement agencies in the state of Texas. In order to complete these various tasks, the Uniform Crime Reporting Section was created for identification and the Crime Records Service took the responsibilities of acquiring, processing, and the publication of data. The data tallies every major arrest that occurs within the state of Texas and analyzes the data of crime trends annually. The crime index sorts the arrest data into eight categories which include the Part I offenses murder, rape, robbery, aggravated assault, burglary, larceny theft, motor vehicle theft, and arson. Once completed, the Texas UCR Program reports arrest data to the National FBI UCR Program. Each year the FBI reports on the number of local law enforcement agencies that reported arrest data. Population estimates for all reporting areas in the United States and Texas are also noted (Texas Department of Public Safety, 2012).

Another data source that will be used in this study is from the Texas Alcohol Beverage Commission (TABC). The TABC was established in 1935 and was initially called the Texas Liquor Control Board. The TABC is the agency that regulates every aspect of the alcoholic beverage industry in Texas. This includes the sales, taxation, importation, manufacturing, transporting, and advertising of alcoholic beverages. Because the TABC has all of these duties, the agency must keep track of how much alcohol is sold within the state of Texas. The agency receives records of all alcohol sold and calculates it through Monthly Per Capita Consumption. The online TABC records can be found as far back as August 2004. The data shows how many gallons of wine, beer, liquor, and ale are sold each month in the state of Texas (Texas Alcoholic Beverage Commission, 2012).

One of the trends that will be examined in this study is the relationship between murder arrest rates and gallons of alcohol sold each month from August 2004 to December 2012 (most recent data). The second trend that will be studied is the relationship between aggravated assault arrest rates and gallons of alcohol sold in each month from August 2004 to December

2012. The data will be retrieved from the publication of the *Texas UCR Program and the Texas Alcoholic Beverage Commission* which will allow an analysis of the correlation of alcohol sales and violent crimes in the aforementioned years. The different seasons will also be examined rather than the months because it will help us understand how different seasons affect alcohol sales, murder incidents, and aggravated assault incidents. This data will also aid us in seeing how alcohol sales affect the incidents of these two violent crimes. Also each month of the season will be examined to see if there is a relationship between alcohol sales and criminal behavior. The seasons will be divided into 3 months. Winter will consist of December of the previous year, January, and February of that same year. Spring will consist of the months March, April, and May. Summer will consist of the months June, July, and August. Fall will consist of the months September, October, and November. Murder was chosen as one of the violent crimes, because it is one of the most serious offenses an individual can be convicted of. Also murder, more than any other crime, is more likely to be reported to the police and cleared of an arrest. Aggravated assault was chosen based on the fact that it is the most prevalent reported violent crime.

The study will not only examine the number of incidents of these violent crimes, but will also look at the crime rate per 100,000 for each of the seasons. This is done due to the fact that the population estimate for the state of Texas varies year by year. The crime rate (number of incidents divided into the total population multiplied by 100,000) will give us a clearer understanding of the seasonal variation of violent crime. In the data tables (excel spreadsheet), the crime rate will be placed in parenthesis next to the number of incidents in each season from 2005 to 2011. This crime rate will show the seasonal variations for each of the years. A line graph will be created for the murder crime rate per 100,000, aggravated assault crime rate per 100,000, and alcohol sales in gallons.

Research Questions

Based on the analysis of the data we will attempt to answer the follow research questions: Is there a correlation between alcohol sales and violent crimes? Which violent crime, murder or aggravated assault, is more influenced by alcohol sales? Which season of the year accounts for the most alcohol sales, murder incidents/rates, aggravated assault incidents/rates? Which season accounts for the least? Through an analysis of the Texas UCR and TABC data, we will be able to reach tentative conclusions on the effect of alcohol on violent crime and the effect of seasonal variations on violent crimes.

Data Analysis & Findings

Based on the data collected we see a trend that summer had the highest incidents of violent crimes and the amount of alcohol sold in gallons in almost every year from the time period Winter 2005 to Fall 2012.

When looking at this data, it is clear that summer accounts for most of the total amount of violent crimes and gallons of alcohol sold for every year studied. From each season from 2005 to 2012, alcohol sales in gallons, murder incidents, and aggravated assault incidents were determined**.** When alcohol sales were calculated for each season for these 8 years, the data clearly shows that summer was the season that had the most alcohol gallons sold (with 1,440,304,038). For the eight years analyzed murder incidents were highest in the summer with 2,736 incidents. Also for these eight years summer had the most aggravated assault incidents with 156,050. Following summer for most alcohol sold is fall which had 1,365,796,340, then spring with 1,266,806,915, and finally

winter with 1,241,084,767. Following summer for most murder incidents is spring with 2,686, then fall with 2,561, and finally winter with 2,399 occurrences. Following summer for the most aggravated assault incidents is spring with 154,050 incidents, then fall with 140,600 incidents, then winter with 126,300 incidents (Table 9).

In every year, the data in figures 1-8 shows that people buy more gallons of alcohol in summer than any other season. From years 2005-2012 fall has the second most alcohol sales in every year. Spring is the 3rd highest in alcohol sales with the exception of 2007 and 2008 in which winter is the third highest. Winter's alcohol sales are the least in every year except 2007 and 2008 (See Tables 1-8; Figures 1-8).

The number of murder incidents rise and fall with the amount of alcohol sold. Murder occurs more in summer than any season with the exception of 2005, 2009, and 2011 as spring has the most occurrences in these years. Spring is the highest in 2005, 2009, and 2011, second highest in 2010, 2008, and 2006, and third highest in 2007 and 2012. Fall has the second highest murder incidents in 2005, 2007, and 2011 and being the third highest in the rest of the years. Winter has constantly the lowest murder incidents with the exception of 2008 (See Tables 1-8).

The aggravated assault incidents differ however, as summer has the most aggravated assault incidents from 2005-2009. Spring has the most incidents from 2010, 2011, and 2012. From 2005-2009, spring has the second highest incidents of aggravated assaults, and then are the highest from 2010-2012. Fall has the third highest incidents of aggravated assaults in each year from 2005-2012. Winter has the lowest number of incidences of aggravated assaults in each year from 2005-2012 (Tables 1-8).

Since the estimated population varies year by year the crime rate per 100,000 was calculated to partially control for population growth. The crime rate can also give us a better understanding of the rise or fall of violent crime. The murder crime rates fall in between 1 to 2 per 100,000 population. Also for each of the seasons the aggravated assault crime rate was between 40 to 90 per 100,000 population. What this can be interpreted to mean is that out of 100,000 people, 1 to 2 people committed a murder in a certain season. Also 40 to 90 people were arrested per 100,000 population for aggravated assault. When examining figures 9 to 16, it is clear to see that in 5 out of the 8 years, summer had the highest murder rate. This represents a modest correlation to alcohol sales with summer alcohol sales leading in all eight of the years. However there is a strong correlation to alcohol sold in the winter. Winter has the lowest violent crime rate in most years while having the lowest alcohol sales in those years.

To see if there is more supporting evidence in the relationship between alcohol sales and violent crime, figures 17 to 24 must be examined as well. While reviewing the line graphs, it is important to see that summer had the highest aggravated assault rate in 6 of the 8 years with winter having the lowest aggravated assault rate in most of the years. This suggests that there is a relationship between alcohol sales and aggravated assaults. (See Figures 17 to 24).

Another trend that was discovered (See Tables 1 to 8) shows that the total gallons of alcohol sold in each year increases from 2005-2012. However, these tables also show that the number of violent crime incidents and violent crimes rates decrease from 2005 to 2012. From 2005 to 2012 the gallons of alcohol sold increase from 621,193,814 to 695,243,041 while the murder incidents decrease from 1,390 to 1,114 and the aggravated assault incidents fall from 75,300 to 67,250. The murder rate drops as well from 2005-2012. We see a

crime rate of 6.08 in 2005 and a decrease to 4.17 in 2012.. The aggravated assault crime rate decreases from 329.41 in 2005 to 257.23 in 2012 (See Table 1 to 8).

Findings

While reviewing the data, we can see that there is a relationship between alcohol consumption and violent crimes. For hypothesis 1, there is a correlation in that when alcohol sales increase in a certain month or season, the murder rates increase as well for that particular year. For hypothesis 2, there was a correlation between alcohol sales in a certain month or season and an increase in aggravated assault rates for that particular year. However the fact that alcohol sales have increased over the years, while violent crime rates have decreased, may suggest that this relationship may not be as powerful as posited in hypotheses one and two. Hypothesis 3 is supported by the data as the summer months had the highest amount of violent crime occurrences and rates. On a side note, spring had the second highest amount of violent crime occurrences and rates. In Texas spring is known to have warm spring months, while summer has the hottest months. Winter usually has the coldest months and had the least amount of violence.

Limitations & Recommendations

There are some limitations to this present research. These limitations mainly center on the data collected.

The first limitation in this research is the data that make up the Texas UCR Program. The on line publication dates as far back as 1999, so we were only able to review the arrest data for 13 years. However, since the research reviews two different sources of data, the correlation could only be examined as far back as August 2004. The TABC published their on line data five years after the Texas UCR Program. Eight years of data is a decent amount of time to see if there is a correlation between alcohol sales and violent crime offenses. However, a longer trend analysis of the data could help us validate if there is a more direct relationship between these two factors.

Another limitation concerns the Texas Uniform Crime Reports and the different agencies that report arrest data every year. Because these particular agencies that report total arrests do so voluntary we may be missing some data. The Texas UCR Program does not give the total amount of agencies that participate each year, but the national UCR Program does. In a given year some agencies in Texas may elect to participate in the UCR program and this may increase the number of arrests that are published. If there is an increase or decrease in the number of reporting agencies participating we would not be aware of this. Another flaw or problem is the potential for certain agencies to tamper with arrest data. They might do this for many reasons; one reason could be by under reporting crime this will make their community appear safer. Because agencies may not report crime or tamper with their reports, the exact number of arrests can never be determined.

Another limitation with the Uniform Crime Reports centers on when an individual is arrested for multiple crimes. For example, if an individual is arrested for aggravated assault and murder, only murder would be reflected in arrest data. By looking at the data, it is very broad, because it gives the number of arrests rather than the number of individuals that are being arrested. Another minor limitation is that not all people that commit crimes are arrested. Also sometimes victims for a variety of reasons do not report crime.

There is also one major limitation with the data from the Texas Alcoholic Beverage Commission. One of these

includes the monthly sales of alcohol. All the alcohol sales reveal is the kind and amount of alcohol sold for each month. This data do not reveal the amount of alcohol consumed in that month. Liquor and wine are usually the two types of alcohol that may be saved for future consumption. The taste and quality of liquor and wine do not diminish as quickly as beer or ale. This means that liquor and wine can be consumed in the same month it was bought, consumed in a different month, or not consumed at all in a given time period.

Recommendations

The relationship between alcohol and violent crime has been well established in the literature. Future research could focus on self report survey data asking people about their drinking patterns and their participation in both property and violent crime. This can be done for both those who have offended and also for those who have been victimized. A wider range of violent crimes committed by offenders or by those who have been victimized could include sexual assaults and robbery.

Conclusion

Based on the data that was collected, it is clear that there is to a certain degree a relationship between alcohol sales and violent crimes in the state of Texas. Also, there is seasonal variation of violent crimes as violent crimes are committed more often in the summer than in any other season. The data reveals a recent trend that while alcohol sales have increased the number of violent crimes and the crime rates have decreased. This research explores the relationship between alcohol sales, violent crime and the seasonal patterns of violent crime. This research sheds further light on understanding how alcohol sales and seasonal variations can affect the incidence of violent crime.

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Appendix A: Data Tables

Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 1					
2012 Estimated Population - 26,146,548					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	160,447,723	167,107,114	188,298,013	179,390,191	695,243,041
Murders	261 (1)	278 (1.06)	306 (1.17)	299 (1.14)	1144 (4.37)
Aggravated Assaults	14,500 (55.5)	18,400 (70.37)	17,900 (68.46)	16,450 (62.9)	67,250 (257.23)
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 2					
2011 Estimated Population - 25,674,681					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	156,963,622	167,254,537	182,913,028	176,239,990	683,371,177
Murders	232 (.9)	305 (1.19)	267 (1.04)	268 (1.04)	1072 (4.17)
Aggravated Assaults	14,800 (57.65)	18,300 (71.3)	17,400 (67.8)	15,300 (59.6)	65,800 (256.35)
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 3					
2010 Estimated Population - 25,145,561					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	154,186,788	160,772,912	181,353,018	169,689,068	666,001,786
Murders	303 (1.2)	304 (1.21)	342 (1.36)	326 (1.3)	1,275 (5.07)
Aggravated Assaults	15,100 (60)	19,500 (77.55)	19,050 (75.76)	17,550 (69.8)	71,200 (283.2)
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 4					
2009 Estimated Population - 24,782,302					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	161,021,538	162,034,868	186,246,996	168,162,620	677,466,022
Murders	302 (1.2)	366 (1.48)	348 (1.4)	306 (1.24)	1,322 (5.32)
Aggravated Assaults	16,700 (67.4)	19,300 (77.9)	20,000 (80.7)	18,200 (73.44)	74,200 (299.44)
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 5					
2008 Estimated Population - 24,326,974					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	159,634,857	158,531,564	185,809,145	175,315,106	679,290,672
Murders	329 (1.35)	353 (1.45)	364 (1.5)	325 (1.34)	1,371 (5.64)
Aggravated Assaults	16,800 (69)	19,550 (80.36)	20,700 (85.1)	18,700 (76.87)	75,750 (311.33)
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 6					
2007 Estimated Population - 23,904,380					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	153,476,967	150,656,392	174,635,446	170,722,779	649,491,584
Murders	323 (1.35)	342 (1.43)	386 (1.55)	344 (1.44)	1,395 (5.77)
Aggravated Assaults	15,600 (65.26)	19,200 (80.32)	19,700 (82.4)	18,200 (76.14)	72,700 (304.12)

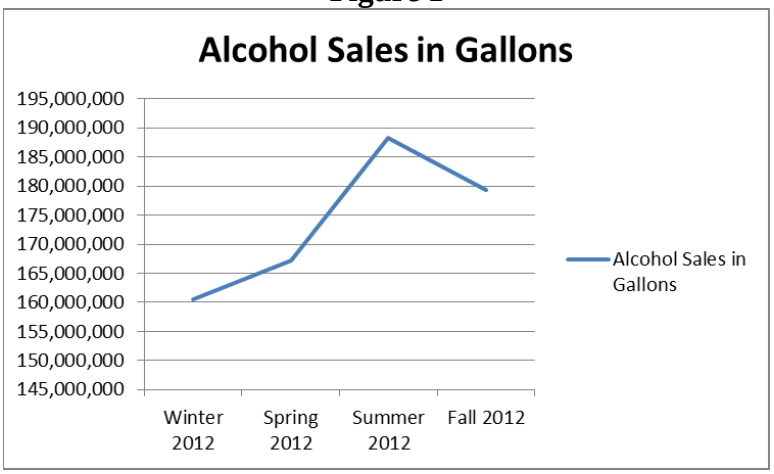
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 7					
2006 Estimated Population - 23,507,783					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	150,833,143	153,025,545	173,482,529	164,592,747	641,933,964
Murders	329 (1.4)	368 (1.57)	386 (1.64)	330 (1.4)	1,413 (6.01)
Aggravated Assaults	16,300 (69.34)	20,100 (85.5)	20,600 (87.6)	17,800 (75.7)	74,800 (318.14)
Crime in Texas -Seasonal Distribution & Crime Rate by Year Table 8					
2005 Estimated Population - 22,859,986					
Offenses Charged	Winter	Spring	Summer	Fall	Total
Alcohol Sales (Gallons)	144,520,129	147,423,983	167,565,863	161,683,839	621,193,814
Murders	320 (1.4)	370 (1.62)	337 (1.47)	363 (1.59)	1,390 (6.08)
Aggravated Assaults	16,500 (72.18)	19,700 (86.18)	20,700 (90.55)	18,400 (80.5)	75,300 (329.41)
Crime in Texas - Seasonal Distribution 2005-2012 Table 9					
Offenses Charged	Winter	Spring	Summer	Fall	
Alcohol Sales (Gallons)	1,241,084,767	1,266,806,915	1,440,304,038	1,365,796,340	
Murders	2399	2686	2736	2561	
Aggravated Assaults	126,300	154,050	156,050	140,600	

Crime in Texas Monthly Distribution & Crime Rate by Year Table 10												
2012 Estimated Population - 26,146,548												
Offenses Charged	January	Febuary	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	59,427,488	45,430,401	49,887,122	58,715,174	58,504,818	68,159,853	63,541,426	56,596,734	66,803,331	55,841,955	56,744,905	58,260,997
Murders	90	80	102	82	94	92	111	103	98	91	110	91
Aggravated Assaults	5400	4600	5750	5950	6700	5850	6000	6050	5700	5600	5150	4950
Crime in Texas Monthly Distribution & Crime Rate by Year Table 11												
2011 Estimated Population - 25,674,681												
Offenses Charged	January	Febuary	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	62,265,675	40,041,662	47,458,469	60,719,658	59,076,410	61,516,587	66,063,942	55,332,499	63,004,422	60,814,006	52,421,562	55,589,834
Murders	75	77	90	105	110	90	92	85	90	95	83	91
Aggravated Assaults	5200	4500	5600	6400	6300	6100	5800	5500	5500	5200	4600	4500
Crime in Texas Monthly Distribution & Crime Rate by Year Table 12												
2010 Estimated Population - 25,145,561												
Offenses Charged	January	Febuary	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	60,455,708	40,383,819	45,114,630	57,079,891	58,578,391	61,203,289	63,822,151	56,327,578	59,471,677	56,327,578	53,889,813	54,656,285
Murders	100	91	86	108	110	111	112	119	104	124	98	80
Aggravated Assaults	5400	4500	6000	6500	7000	6400	6350	6300	5800	6250	5500	5100

Crime in Texas Monthly Distribution & Crime Rate by Year Table 13												
2009 Estimated Population - 24,782,302												
Offenses Charged	January	Febuary	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	64,005,437	45,367,004	47,409,913	56,454,506	58,170,449	60,438,920	64,068,705	61,739,371	56,409,241	58,125,274	53,628,105	53,347,261
Murders	102	90	111	117	138	108	124	116	107	100	99	112
Aggravated Assaults	5700	5100	6100	6100	7100	6500	6500	7000	6400	6000	5800	5200
Crime in Texas Monthly Distribution & Crime Rate by Year Table 14												
2008 Estimated Population - 24,326,974												
Offenses Charged	January	February	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	58,360,139	45,433,194	46,549,099	54,422,811	57,559,654	63,388,609	60,228,503	62,192,033	58,578,005	57,225,636	59,511,465	51,649,097
Murders	98	113	105	130	118	130	122	112	111	119	95	110
Aggravated Assaults	5800	5300	6200	6250	7100	6700	7000	7000	6400	6500	5800	5900
Crime in Texas Monthly Distribution & Crime Rate by Year Table 15												
2007 Estimated Population - 24,904,380												
Offenses Charged	January	February	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	55,510,601	43,543,844	44,025,927	54,588,676	52,041,789	62,730,558	57,828,517	54,076,371	63,455,051	49,183,772	58,083,956	55,841,524
Murders	110	112	115	109	118	117	130	139	141	101	102	118
Aggravated Assaults	5300	5000	6300	6100	6800	6500	6700	6500	6600	6100	5500	5700
Crime in Texas Monthly Distribution & Crime Rate by Year Table 16												
2006 Estimated Population - 23,507,783												
Offenses Charged	January	February	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	55,972,325	41,473,880	45,626,003	53,559,287	53,840,255	62,732,770	61,046,548	49,703,211	61,104,759	50,504,980	52,983,008	54,422,522
Murders	114	90	125	120	123	130	117	139	135	99	96	101
Aggravated Assaults	5800	5000	6100	6800	7200	6500	7400	6700	6300	6000	5500	5300
Crime in Texas Monthly Distribution & Crime Rate by Year Table 17												
2005 Estimated Population - 22,859,986												
Offenses Charged	January	February	March	April	May	June	July	August	September	October	November	December
Alcohol Sales (Gallons)	56,138,312	38,096,586	42,177,050	54,234,461	51,012,472	57,915,825	59,336,162	50,313,876	57,312,191	53,118,109	51,253,539	53,386,938
Murders	108	102	105	140	125	107	110	120	118	125	120	125
Aggravated Assaults	5800	5100	6000	6500	7200	6800	7100	6800	6600	6400	5400	5500

Appendix B: Figures

Figure 1



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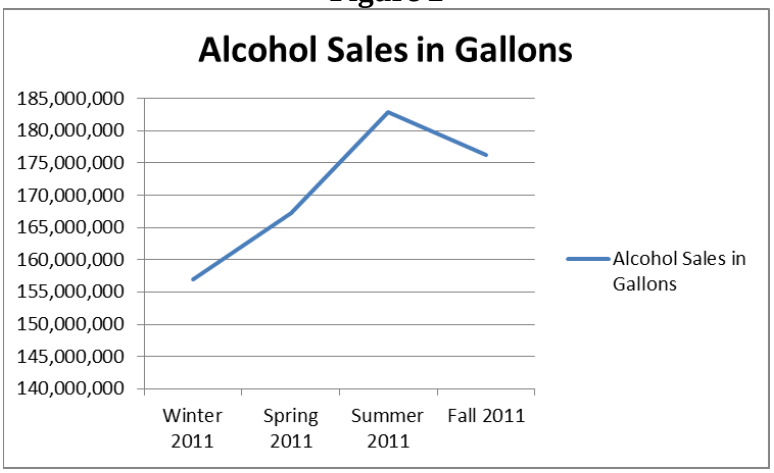

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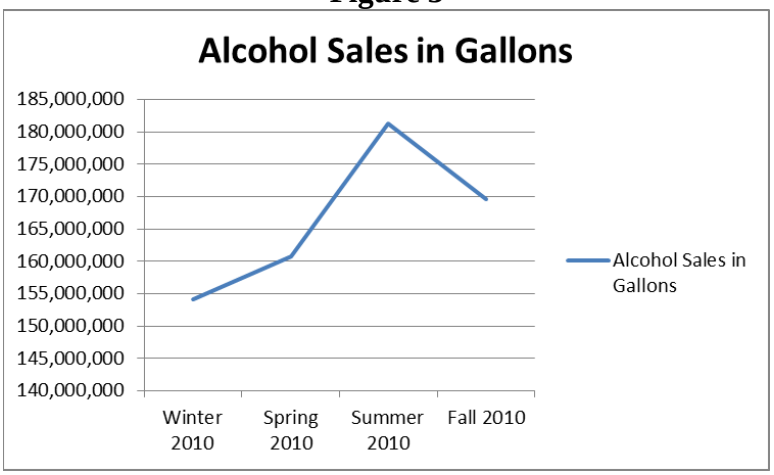
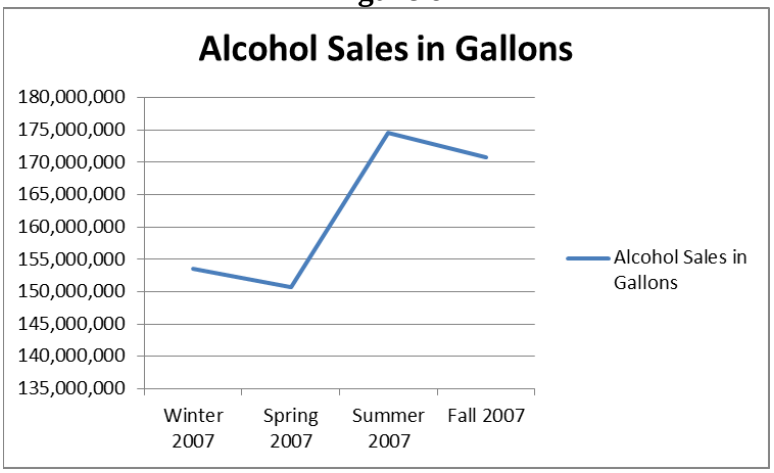


Figure 4

Figure 5

Figure 6



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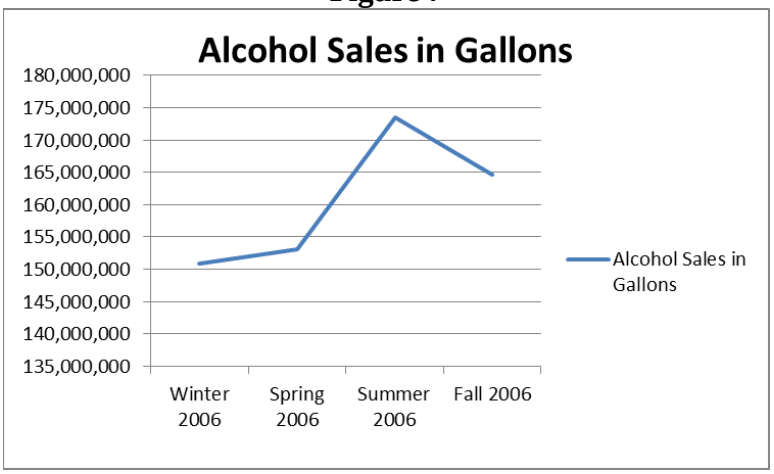

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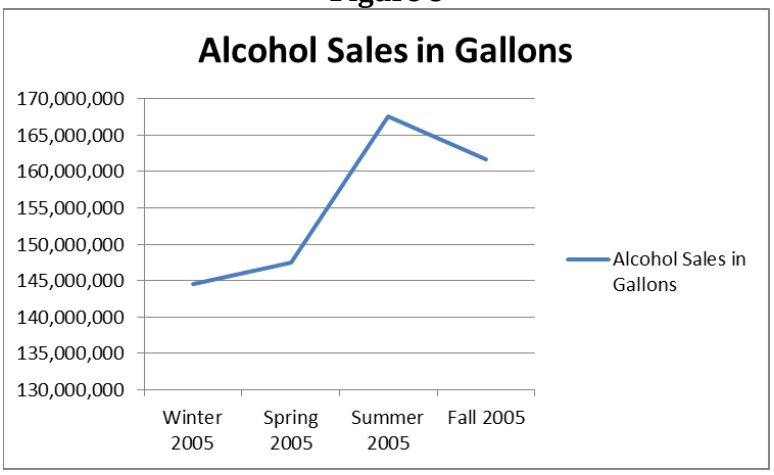

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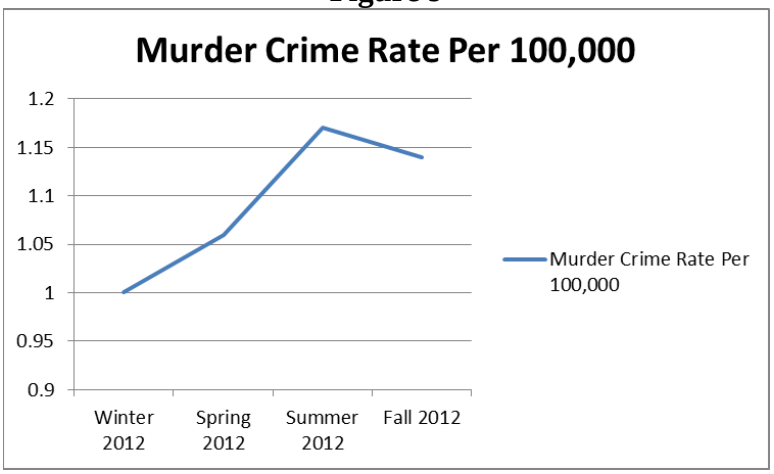

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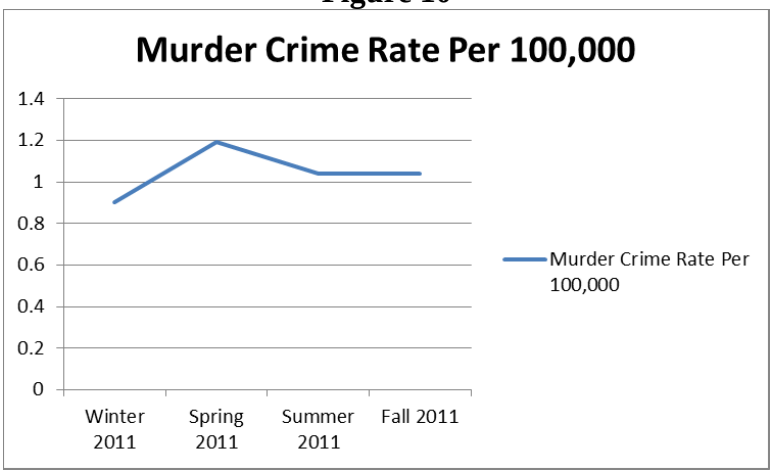

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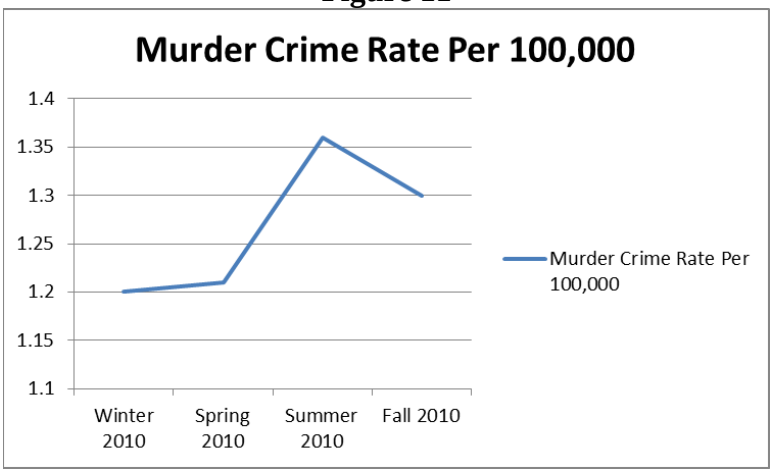

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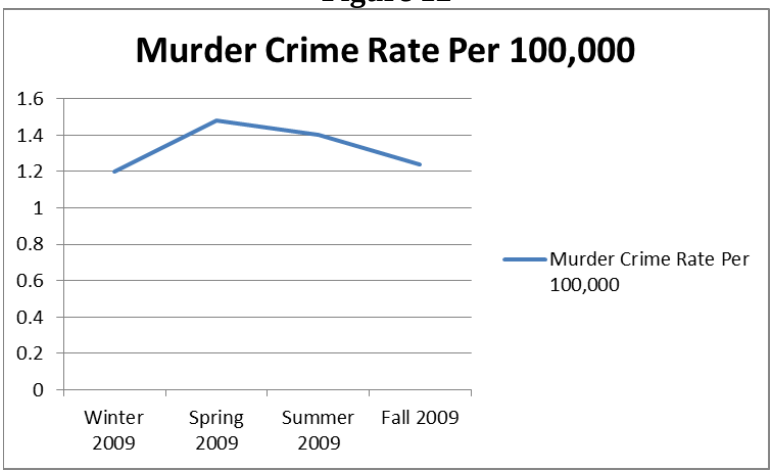

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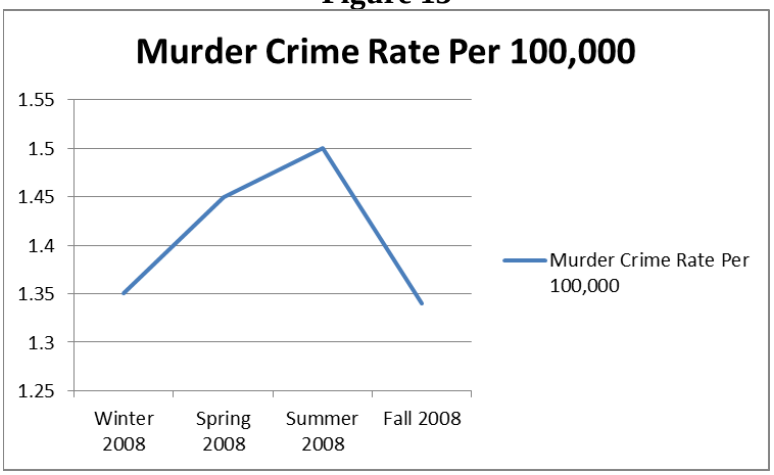

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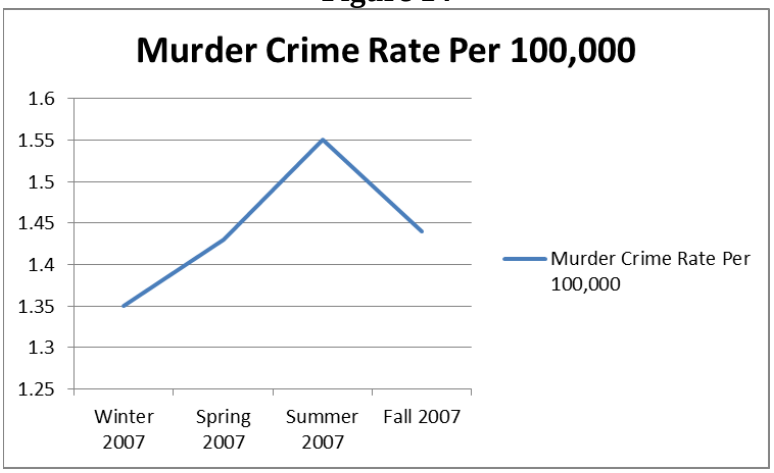

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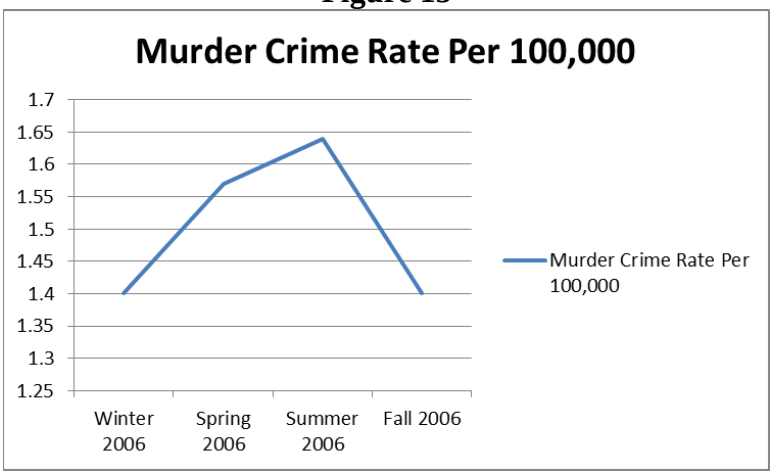

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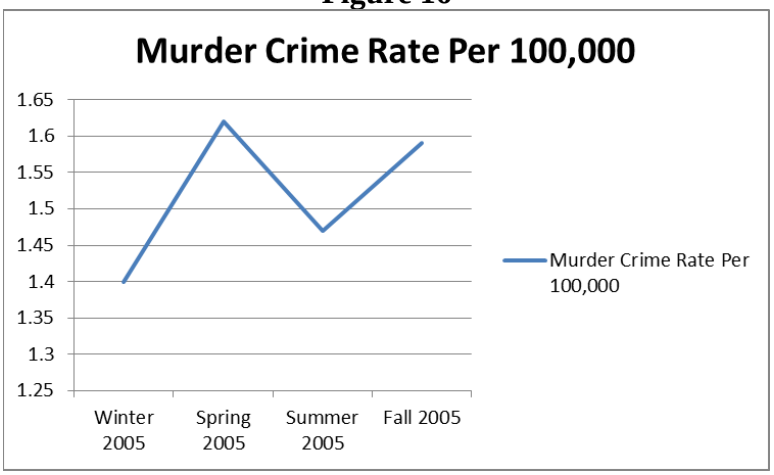

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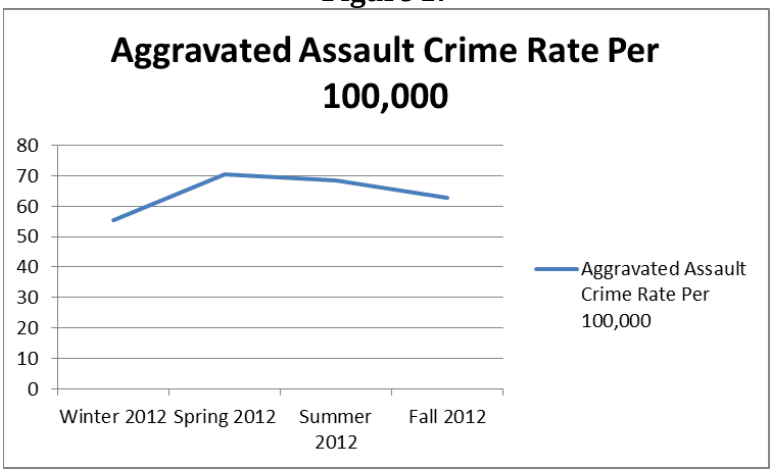

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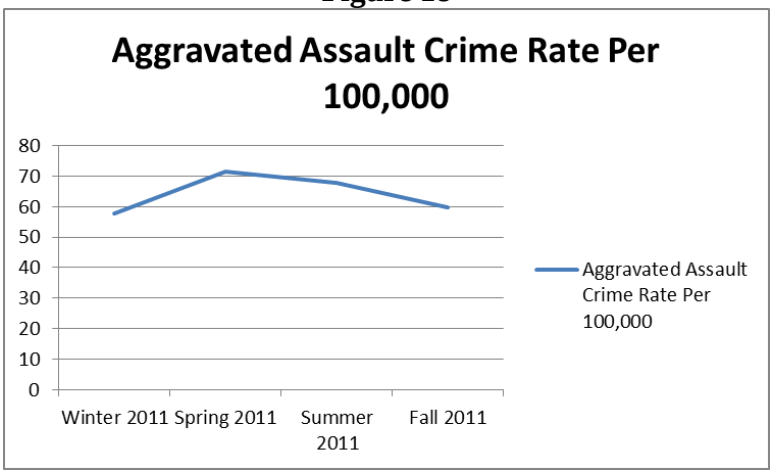

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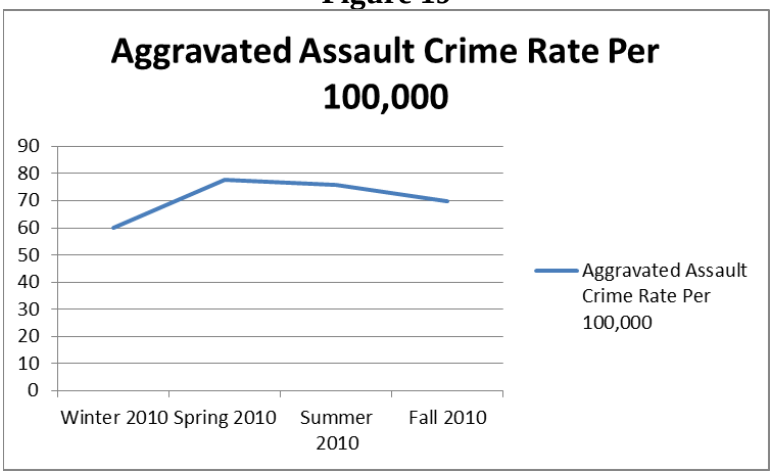

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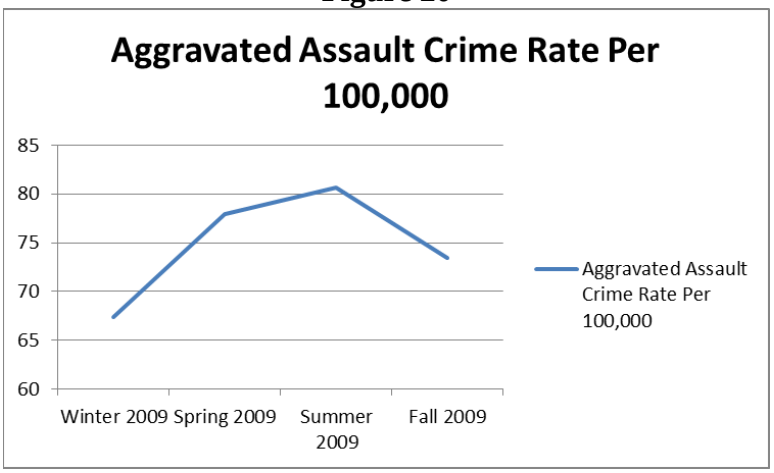

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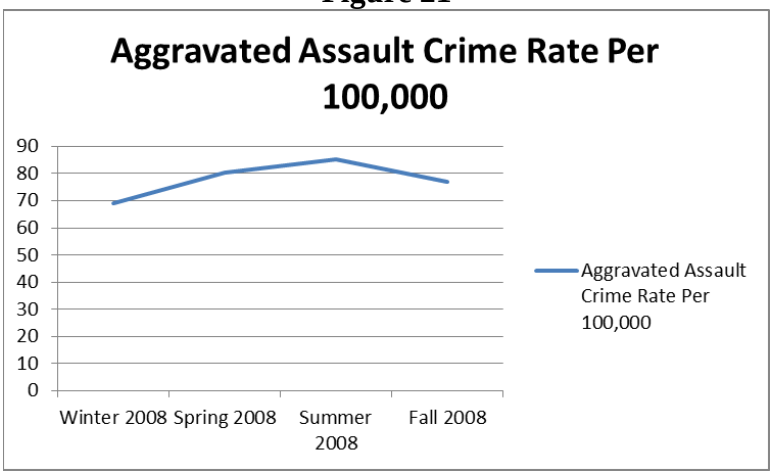

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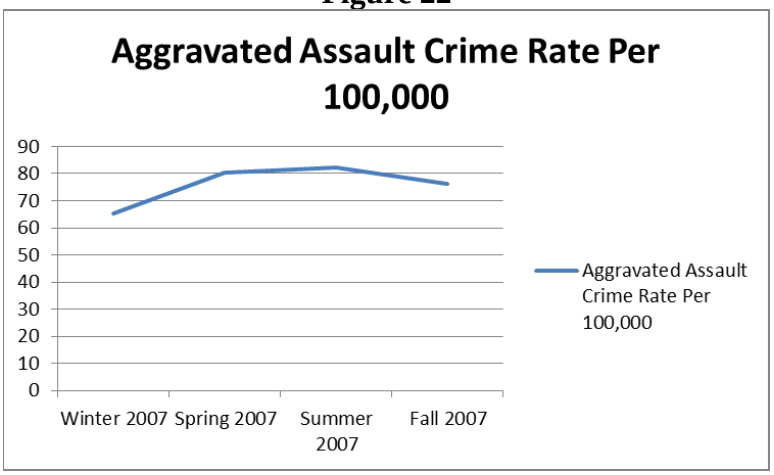

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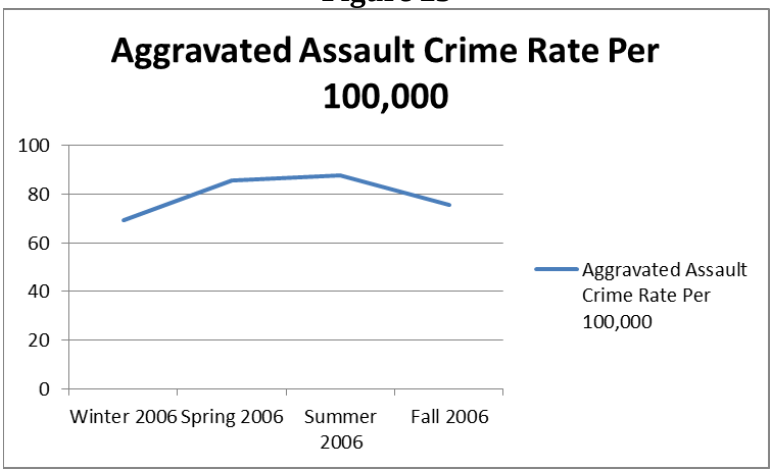
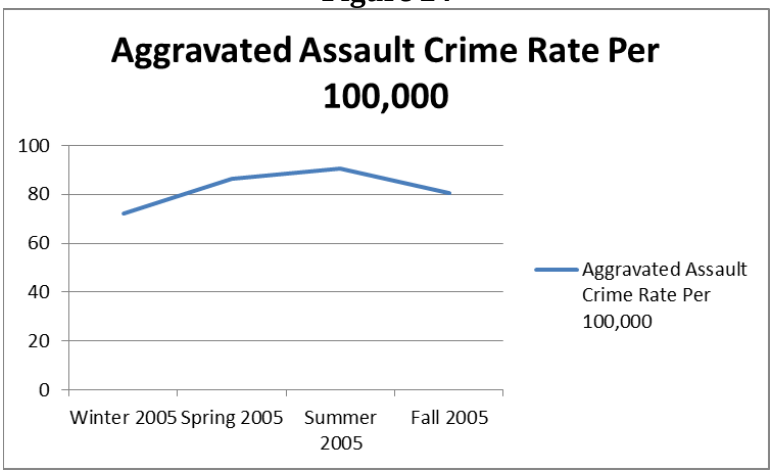
Figure 24