

2016

**Sonoma State University
McNair Scholars
Research Journal**

Volume 6
2016

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Sonoma State University

**McNair Scholars
Research Journal**

Published by the McNair Scholars Program
at Sonoma State University

A federal TRiO program

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To the Reader:

The goal of every federal McNair Scholars program is to place historically underrepresented students in master's and PhD degree programs. SSU's McNair Scholars program shares this same goal. Through workshops, individual advising, faculty mentoring, and research experiences, we assist students in getting accepted into graduate school programs and prepare them in ways that will promote their success once they get there. We work with students from every academic major and at all grade levels.

As we guide students through the process of preparing for graduate school, our goal is to help students enroll in a graduate school program that is the best fit for them, based on their research interests as well as academic and career goals. This involves not just helping them get accepted into multiple programs so that they can choose among them, but also helping them to gain the kinds of experiences that graduate programs value in applicants prior to the application period. We investigate graduate programs with the scholars in order to find the right fit, help them locate and apply for research internships and conferences, and we work with them on their Statement of Purpose and other application materials. Over the years, a high percentage SSU McNair Scholar who have applied to graduate programs have gotten accepted, and most received funding in the form of fellowships and/or assistantships, even at the master's degree level. We are confident that we will continue to see similar results in the future.

In order to gain valuable research experience and refine their scholarly interests, McNair Scholars work on a research project during each year of participation in the program. This research is conducted under the guidance of a faculty mentor, who typically helps the scholar through every phase of the research process. We are very proud of the research work that SSU's McNair Scholars have done, and examples of this work comprise the content of this journal. When you flip to the Table of Contents, you will see that this work covers a wide spectrum of majors offered at SSU. Our McNair Scholars have produced high quality research in the sciences, social sciences, and humanities. We would like to offer our gratitude to faculty who have generously provided their time, knowledge, and enthusiasm to helping to develop the projects found in this journal.

All of the work in this journal has been presented at our annual symposium, some of the work you see here has been presented at professional academic conferences, and some of it will be presented in the near future. As you read these articles, you will see that this work has great potential to contribute to knowledge in the scholars' academic disciplines. As they have worked on these projects, these students have become increasingly aware of what it takes to become a member of the scholarly community. And, as we are sure you will agree, they are ready to go on to graduate school and continue to succeed. We are also sure you would like to join us in wishing them good luck and in congratulating them on a job well done!

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Table of Contents

1	A Numerical Optimization for a Cyclophosphamide-Leukocyte Integrative Model By Matea Alvarado
15	Attitudes of Sonoma State Latino Students Toward Foreign Language Education By Seiri Aragón-García
28	The Role of Non-Catalytic Cysteine Residues in Controlling the Sensitivity of Protein Tyrosine Phosphatases to Oxidation By Juliet Bartleson
35	Restorative Justice Volunteers By Kevin Angelo Brown
48	Minimizing Experiment Mortality in Kinesiological Research: An Examination of Research Participants' Experiences By John Michael Vincent Coralde
57	Navigating And Framing The Education And Identity Of Children With an Autism Spectrum Disorder (ASD) Within The Structure Of Public Schools: Parents As Caretakers, Interpreters And Advocates By Jennifer Dueñas
74	Negotiating the Transition from Veteran to Student By Katie Gordon
86	Carnobacteriocin BII Peptide Bactericidal Assay By Joshua Gutierrez
92	Injured on the Job: The Missing Safety Net Affecting Injured Day Laborers in Residential Employment in California By Jesús Guzmán

99	The Connection Between Colonialism, Imperialism and Modern Slavery By Kagemuro Jeremiah
109	Assessing Competitive Behavior in Captive-Raised Western Pond Turtles By Shoua Lor & Hong Mai
114	The Role of State Ideology in the Palestinian-Israeli Relationship By Yadira D. Molina
125	Ritual Violence: The Creation of Order and Structure in the North Coast of Peru By Samantha Montellanos
133	“People who speak into your lives:” Exploring the central connections between former foster youth and mentors. By Kim Nguyen
146	What Factors or Characteristics Influence Satisfaction with Family Quality of Life? By Ashley Royston
156	Hobby Lobby and Reproductive Politics: A Textual Policy Analysis By Kristina Saylor
164	Reduction of Molecular Oxygen by Glutathione Persulfide By Victor Sosa Alfaro
175	The Significant Difference of School Performance Between African Immigrant and Native-born African American Students By Sosina Teweldebrhan

183

Black Women's Perspectives on Higher Education

By Tamaiah Thompson

197

Childhood on Stage: Performing Boy Companies of Elizabethan England

By Brittiny Tirapelle

211

Quantification of a Photochemical Carbon Monoxide Releasing Molecule (PhotoCORM) Using a Binuclear Rhodium(II) Comple.

By Kimberly Trevino

217

Behavioral Enrichment: Assessing the Well-Being of Zoo Living Mandrills

By Donald Williams

A Numerical Optimization for a Cyclophosphamide-Leukocyte Integrative Model

Matea Alvarado, Mathematics

Research Mentor: Martha Shott, Ph.D.

Abstract

A dangerous side effect of a chemotherapy drug called cyclophosphamide can contribute to the advancement of cancer treatment. Modeling the toxic effect of cyclophosphamide on leukocytes has implications in assisting oncolytic virotherapy, the use of engineered viruses to combat cancerous cells. The pharmacodynamics of cyclophosphamide and its metabolites are modeled as well as its indirect and direct effect on leukocyte numbers. This is accomplished by using compartmental ordinary differential equations. The ultimate goal is optimizing the dosage of cyclophosphamide such that the leukocyte population is suppressed while the cyclophosphamide concentration is maintained in a safe range.

Introduction

Cyclophosphamide is a pro-drug that is typically used in immune suppression and chemotherapy. It has been used recently to augment oncolytic virotherapy, the use of engineered viruses to combat tumors. Initially the viral therapy was only marginally successful due to the immune response it elicited. Cyclophosphamide is used to suppress the immune system so that the viruses can infect and kill the cancerous cells in the body (Li, Liu, & Wong-Staal, 2008). Similar models have been built, to model either the difference in effectiveness of engineered virus with and without cyclophosphamide dosing (Wang & Tian, 2008), or the effect of chemotherapy drugs on the hematopoiesis (Luebeck, 2000). However the model presented in this paper is unique because it specifically targets the reactions of sensitive cells and uses only human data to approximate parameters.

Method

Cyclophosphamide (CY) is inactive until it reaches the liver and then is metabolized to hydroxycyclophosphamide (HCY) which lives in equilibrium with its tautomer aldophosphamide (AP) (Boddy, & Yule, 2000). About 70% of CY is metabolized to HCY; the rest is excreted unchanged in urine (McDonald, Slattery, Bouvier, Ren, Batchelder, Kalthorn, ... Gooley, 2003). HCY is mainly excreted through the reactions of AP. AP is eliminated by its oxidation to an inactive compound carboxycyclophosphamide in the liver. It also freely diffuses into cells where it is converted to phosphoramidate

mustard and acrolien which are the main cytotoxic metabolites of CY. Cells that are sensitive to these compounds, such as hematopoietic progenitor cells, then undergo apoptosis (Emadi, A., Jones, R., & Brodsky, R., 2009). The model focuses on the cyclophosphamide

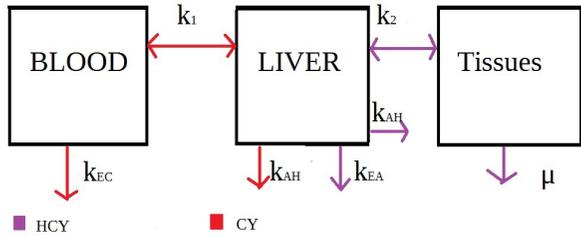


Figure 1 CY-HCY Model

concentrations in the liver (and blood) and the HCY concentrations in the liver (and tissues) (see Fig.1). This is based on the assumption that the tissues is where the cytotoxic activity is happening rather than the blood, which is simply a means of transport between the liver and tissues. The HCY is tracked rather than the AP for simplicity and because there is much more available data tracking hydroxycyclophosphamide rather than aldophosphamide. In each differential equation the transport is modeled based on a concentration gradient, so that the drug dynamically flows to a lower concentration based on the mechanics of passive diffusion. The parameters approximate these rates per hour. The corresponding system of differential equations is below (with the parameters explained more in depth in Table 3).

$$\frac{dC_B}{dt} = -k_1(C_B - C_L) - k_{EC}C_B + D(t)$$

$$\frac{dC_L}{dt} = k_1(C_B - C_L) - k_{AH}C_L$$

$$\frac{dH_L}{dt} = -k_2(H_L - H_T) - k_{EA}H_L + k_{AH}C_L$$

$$\frac{dH_T}{dt} = k_2(H_L - H_T) - \mu H_T$$

$D(t)$ is the controlled dose given every 24 hours; it is defined by a simple piecewise function that is a fixed value every 24 hours and is zero all other times.

The parameters found here are all from “Cyclophosphamide and 4-hydroxycyclophosphamide pharmacokinetics in patients with glomerulonephritis secondary to lupus and small vessel vasculitis” (Joy, La, Wang, Bridges, Hu, Hogan, . . . & Falk, 2012). Furthermore data were received from this study that tracked the plasma concentrations of both CY and HCY in 23 different patients. These patients’ ages varied and both genders were represented. All patients either had systemic lupus (SLE) or small vessel vasculitis. Although the study reported that the pharmacokinetics of CY in cancer patients was different than the patients in the study, this data set was desirable because the patients were given

Numerical Optimization

a relatively low CY dose which fit much more with the model (Joy, et al., 2012).

The data were condensed into the average blood concentrations at the measurement points $t=0, 0.5, 1, 2, 3, 4, 6, 8, 12, 18, 24$ hours, taking the varying doses into account. Since the CY measurements given were only plasma concentrations rather than whole blood concentrations, an approximate whole blood measurement had to be accounted for. There are about equal parts plasma and blood cells in the blood (“Blood Basics” 2015) and the whole blood versus the plasma concentrations in the blood are extremely similar (Chen, Kennedy, Anderson., Kiraly, Black, Colvin, & Grochow, 1997). Given this information it is reasonable to assume that the whole blood concentrations are twice the plasma concentrations of the CY. There was little to no information found about the whole blood concentrations of HCY, so the values given from the study were used in want of more information.

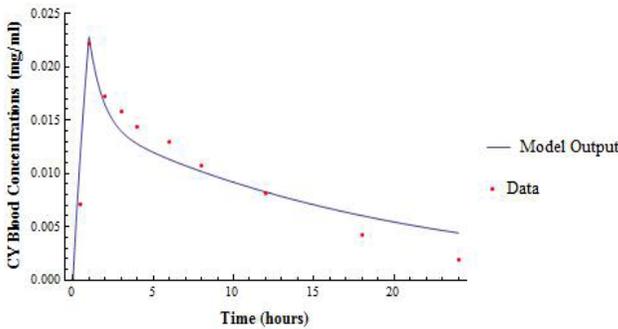


Figure 2 Data CY blood concentrations vs. model output

Several model parameters made it possible to be extrapolated from both the CY and HCY data. From the condensed CY data two parameters were found, the and the dose conversion into a concentration in the body (called DCCB, which is a percentage) parameters. To elaborate, the dose is given as mg/ml into the blood, assuming an instantaneous dispersal. Assuming that there are about 68 (a weighted average) ml of blood per kg of body weight (Lemmens, H., Bernstein, D., & Brodsky, J., 2006; Rodman, 2014) and because the model only tracks the concentrations in the blood and liver, a certain percentage of the inputted dose goes to the blood, while the rest gets dispersed instantaneously to the body (excluding the liver). The blood represents about 7% of our body weight (“Blood Basics”, 2015) and the liver is about 2% of our body weight (Chan, Liu, Lo, Lam, Lee, Wong, & Fan, 2006), so the model initially assumed that 9% of the CY was directly inputted in the blood and the rest was evenly distributed throughout the body. However this assumption yielded a very small amount in the liver, which led to unreasonably small amounts of HCY in the blood. Since certain parts of the body will not be as accessible (hair, skin, etc.) and it is reasonable to assume that the blood will have a higher concentration than the rest of the body, finding higher DCCB is justified. Again using the Mathematica command FindFit, the DCCB was slowly increased as high as possible while still getting reasonable output and values. The model output vs. the condensed data is shown in Fig2.

From the condensed HCY data the excretion rates in the liver and tissues

were approximated. Through trial and error (FindFit in Mathematica yielded unreasonable results), these 2 parameters were found in order to match the magnitude of the blood concentrations of the HCY (which was inputted to the model solely for that purpose). This model was able to fit the correct blood magnitude for a given dose, however the time that the model has the blood concentration peak is around 6 hours, whereas the data blood magnitude peaks at the first hour. The overall results are looking at multiple days so the time the HCY peaks is less important, there is just a few-hour delay so it seemed to be a reasonable approximation. The model output vs. the condensed data is shown as Fig.3. All parameters were found with the exception of . Since is relatively insensitive, meaning that small changes don't change the data significantly, and given the lack of other data, the best assumption for is that it is similar to.

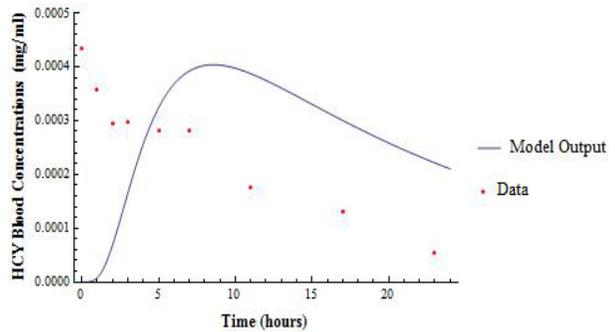


Figure 3 Data HCY blood concentrations vs. model output

The output for the model over the whole 10 days is shown below. Fig. 4 shows the concentrations of CY in the liver and blood and the concentration of the HCY in the liver and tissues.

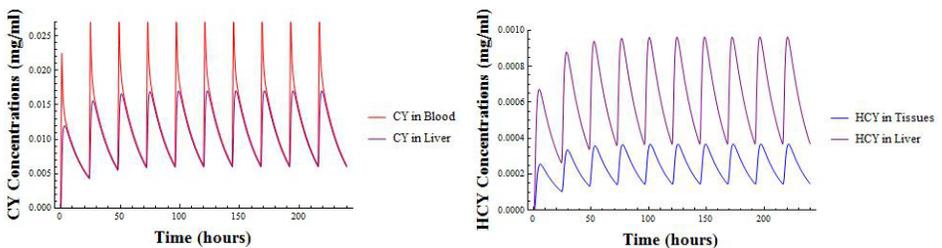


Figure 4 Concentrations of CY and HCY over 10 days

The model for the leukocyte population is based on Mangel & Bonsall's article "Stem Cell Biology is Population Biology: Differentiation of Hematopoietic Multipotent Progenitors to Common Lymphoid and Myeloid Progenitors" (2013). It has five compartments: stem cells, multipotent progenitor cells, common lymphoid progenitor cells, common myeloid progenitor cells, lymphocytes and myeloid cells. The cells of interest are the lymphocytes and granulocytes (which are a small subset of the myeloid cells). To adapt the model two major assumptions were made. The first was that the ratio of lymphocytes to myeloid cells was

Numerical Optimization

1:1000, which was an average ratio found in the original model. The second was a 3:7 ratio of lymphocyte to granulocyte, which is an assumption that was held constant throughout the entire model construction.

The actual ratio of lymphocytes to granulocytes varies depending on immune response, health, and other factors (Friedburg, 2003). This ratio was in the middle of the range and the numbers made it easier to convert the existing model into a model that was relevant to our focus. The differentiation of multipotent progenitor cells to common lymphoid and myeloid progenitor cells was based on a probability function. That probability was fixed based on an assumed a homeostatic state in the body. Holding that as a constant fixed rate made it easy to combine the two different common progenitor cells into one compartment, especially because their death rates were equivalent. A previous assumption of a 3:7 ratio of lymphocytes to granulocytes in homeostasis meant 30% of the time the common progenitor cells divide they becomes lymphocytes. In order to get a plausible ratio of common progenitor cells to the leukocytes, there is an assumption of a 3:7:2993 ratio of lymphocytes to granulocytes to the other myeloid cells. Then the percent of leukocytes (lymphocytes and granulocytes) in total cells is 10/3003. So in terms of the model that means only 10/3003 of common progenitor cells created lymphocytes and granulocytes. The ratio also shows that granulocytes are 7/3000 of the myeloid cells, so then $m=3000/7$ was substituted in to the feedback functions that were dependent on the myeloid and lymphocyte populations.

The adapted model (shown in Fig. 5) has 4 groups of cells: stem cells (S), multipotent progenitor cells (MPP), common progenitor cells (CM), lymphocytes (L), and granulocytes (G). Stem cells produce themselves and multipotent progenitor cells, while multipotent progenitor cells produce themselves and common progenitor cells, while common progenitor cells in turn produce lymphocytes (which can multiply) and granulocytes (which cannot). However the rates in which the stem cells and multipotent progenitor cells reproduce are dependent on feedback from the lymphocyte and granulocyte concentrations (Mangel & Bonsall, 2013). In Fig.5 the functions represent this feedback.

This model also incorporates the cytotoxic effects on the multipotent progenitor cells and common progenitor cells. Additional parameters are explained in more depth in Table 3.

The term $\ln(K/S)$ expresses the assumption that there is a maximum density K of stem cells in a niche. The α terms take the toxic effect of HCY into account, where α is the kill rate of the cells dependent on the concentration of HCY

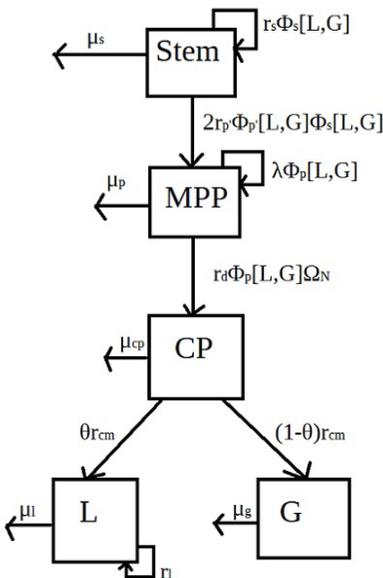


Figure 5 Leukocyte Model

in the tissues. The cells that HCY actually kills are progenitor cells and common progenitor cells; stem cells and granulocytes are comparatively resistant to HCY toxicity (Emadi, Jones, & Brodsky, 2009). So additional parameters were added as rates that HCY kills MMP and CM (respectively). The use of θ will be explored later on.

The corresponding differential equations and feedback functions are given below.

$$\frac{dS}{dt} = S \ln\left(\frac{K}{S}\right) (r_s + r_{p'} \varphi_{p'}(L, G)) \varphi_S(L, G) - \mu_S S$$

$$\frac{dMPP}{dt} = S \ln\left(\frac{K}{S}\right) (r_s + 2r_{p'} \varphi_{p'}(L, G)) \varphi_S(L, G) + MPP((\lambda - r_d) \varphi_p(L, G) - \mu_p - \alpha_1 H_T)$$

$$\frac{dCM}{dt} = MPP((\lambda - r_d) \varphi_p(L, G) - CM(r_{cm} + \mu_{cm} + \alpha_2 H_T))$$

$$\frac{dL}{dt} = CM r_{cm} \theta \frac{10}{3003} + L(r_{cm} - \mu_l - \alpha_3 H_T)$$

$$\frac{dG}{dt} = CM r_{cm} (1 - \theta) \frac{10}{3003} - G \mu_g$$

Where $\varphi_S(L, G) = \text{Max}\left(\frac{1}{1+10L}, \frac{1}{1+\frac{300L}{7}}\right)$, $\varphi_{p'}(L, G) = \text{Max}\left(\frac{1}{1+20L}, \frac{1}{1+\frac{600L}{7}}\right)$, and $\varphi_p(L, G) = \text{Max}\left(\frac{1}{1+100L}, \frac{1}{1+\frac{30L}{7}}\right)$

Using the NDSolve function in Mathematica on the leukocyte model (without the effect of HCY), the long-term behavior was observed. Through various initial conditions we found hesitant equilibrium values that were used as the initial conditions in the combined model. Starting at equilibrium would provide a more accurate view of HCY's effect on the cells.

The only parameters that we had to find in this model were the α values. These were extrapolated from an in-vitro study done on purging human bone marrow with a derivative of HCY (Siena, S., Castro-Malaspina, H., Gulati, S., Lu, L., Colvin, M., Clarkson, B., . . . Moore, 1985). The results from the study showed different percent decreases of CM and MPP cells after a half hour of different constant concentrations of HCY. Given that the time was so small, there was an assumption that the birth, death, and feedback of the model would have less impact, so simple decreasing exponential equation were used.

$$\frac{dMPP}{dt} = -\alpha_1 CMPP \rightarrow MPP(t) = MPP(0)e^{-\alpha_1 Ct} \rightarrow \frac{MPP(.5)}{MPP(0)} = e^{-\alpha_1 Ct}$$

Where $\frac{MPP(.5)}{MPP(0)}$ is the percent decrease of MPP cells after half an hour, and C is the constant concentration of HCY, thus it is easy to solve for α_1 . Similar methods were used to find α_2 . When α_1 and α_2 were inputted into the leukocyte model with their corresponding HCY concentrations, the percent decrease in MPP and CM cells after a half hour were extremely close to those

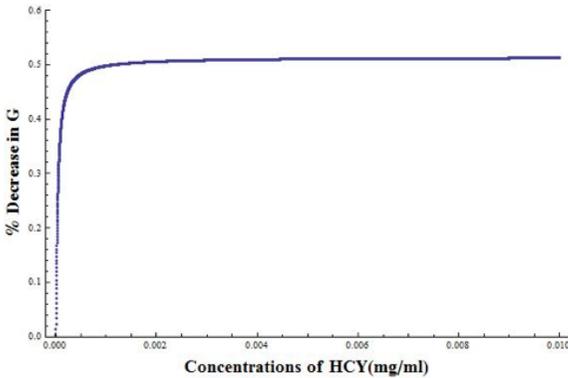


Figure 6 Percent decrease in granulocytes dependent on varying HCY tissue concentrations

from the study. Different α parameters were needed with different concentrations. However since 3 concentrations were reported, with only 2 useful concentrations, there wasn't enough data to strongly suggest that α_1 and α_2 were anything other than constant rates and the differences were due to regular data variation. The rounded average of the different α_1 and α_2 parameters were inputted with the different HCY concentrations into the model

with reasonable results. The percent decrease of MPP cells after half an hour was still within a 10.2% decrease of the expected percent decrease and the percent decrease of CM cells was within a 5% decrease. This yields a good approximation for α_1 and α_2 considering the expected values were approximations found from a graph. Also simulation of the model shows that the percent decrease in leukocytes was much more sensitive to variation in α_1 and α_2 .

The α_1 and α_2 values alone did not decrease the leukocytes to the extent that was expected. The percent decrease of leukocytes displayed strange asymptotic end behavior shown in Fig. 6 (this shows only granulocyte behavior but the lymphocytes displayed identical behavior). Even with a constant HCY concentration of tissues associated with a daily dose of 200 mg/kg (which is a huge amount), the leukocytes only decreased about 51.35%. In the preliminary research done in preparation for this study, it was mentioned that lymphocytes were sensitive to HCY (Emadi, Jones, & Brodsky, 2009), but there wasn't enough information to justify an initial assumption of a direct kill rate of lymphocytes. After observing the effect of only an α_1 and α_2 makes a theoretical parameter (kill rate of lymphocytes) much more justifiable.

The first step is to see the effect of an α_3 and different concentrations of HCY. A multivariable function was created where HCY concentrations and values are inputs α_3 and the output is the percent decrease in lymphocytes (shown in Fig. 7).

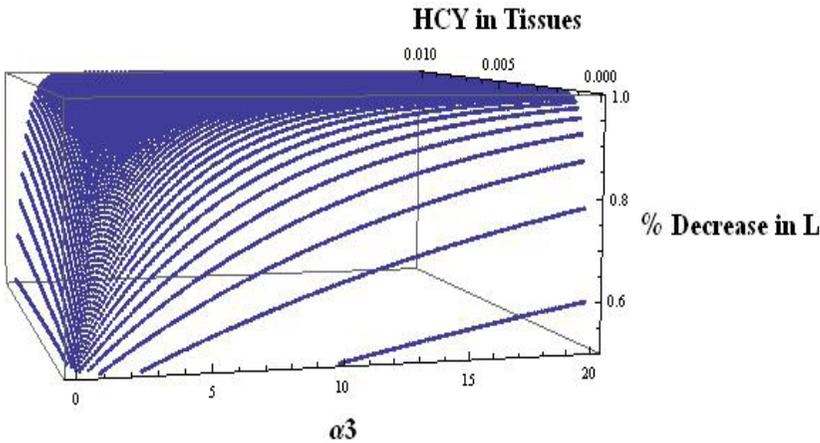


Figure 7 Percent decrease in lymphocytes dependent of varying α_3 and HCY tissue concentration

This graph shows that as HCY gets really high or as α_3 gets larger, the percent decrease of L gets close to 100%. This makes intuitive sense and validates the theoretical existence of an α_3 value in terms of this model. However since the other α values were much higher than 20 (the max α_3 in Fig.8), a larger range of values needs to be explored. Since running this function is time consuming the corresponding HCY range had to be minimized. Finding a more reasonable range of HCY concentration began with finding the relationship between the daily dose (in mg/kg) of CY and the corresponding average concentration of HCY in the tissues (in mg/ml) over 10 days. The varying doses from 0 to 50 mg/kg/day with corresponding average HCY concentrations was fit to a linear curve using Mathematica command FindFit. Using the average HCY concentration for a daily dose of 0 to 30mg/kg/day (which is a high daily dose) were obtained, which yielded a more acceptable average HCY concentration range. This function was run again with a finer mesh then a cross section was taken at the desired percent decrease of lymphocytes, which is explained more thoroughly in Table 1.

Table 1 Summary of normal and low WBC subset counts and the corresponding percent decreases

	Normal Range in WBC Count	Average Count	Danger Area	Safe % Decrease Range	Average % Decrease
Lymphocytes	1350-3000*	2175	>1000**	25.9-67	54.023
Granulocytes	3150-7000*	5075	>1970*	37-72	60.9

*(Dugdale, 2013)

**("What Is Lymphocytopenia?", 2013)

Results

The first significant result was the relationship between the daily dose (DD) and the average concentration of the HCY in tissues over 10 days (AvgHCY). From the linear fit we found a relationship of DD in terms of AvgHCY:

$$DD = 71492.13 * AvgHCY \tag{1}$$

Using the graph that looks at the percent decrease of L by varying AvgHCY from 0 to .0004 and from 0 to 100, find a cross section where the percent decrease of L is between .499 and .5001. A 50% decrease is desirable because it is 4% higher than the decrease associated with the average L decrease into the danger zone. Using FindFit in Mathematica this relationship was modeled with the equation $AvgHCY = \frac{Q}{\sqrt{\alpha_3}}$, with Fig.8 below showing the fit of the equation to the cross section of the model output.

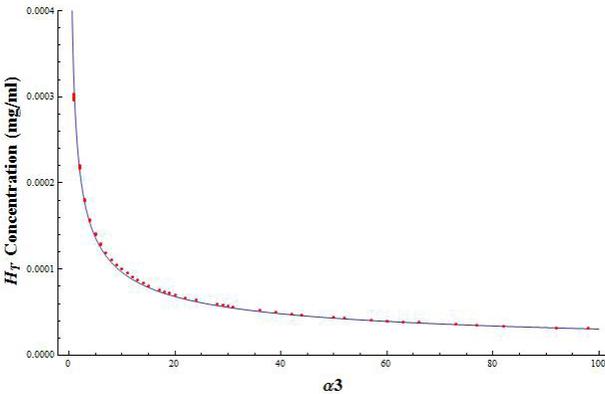


Figure 8 Eqn. 2 vs. model output

Solving for the corresponding DD that would be required to attain that AvgHCY,

$$DD = 71492.13 \frac{Q}{\sqrt{\alpha_3}} \tag{2}$$

$$\alpha_3 = \left(71492.13 \frac{Q}{DD} \right)^2 \tag{3}$$

These equations were tested using the entire 7-equation system. First with the different daily doses inputted from 0.5 to 50 mg/kg/day, incrementing by 0.5, and the corresponding α_3 found with Eqn. 2. This yielded a percent decrease in lymphocytes to an accuracy of within 1.46775 of a 50% decrease. Eqn 3 was also tested with different values being inputted from 1 to 300 and the corresponding DD found in Eqn 3; this yielded a percent decrease in lymphocytes to an accuracy of within 1.46773 of a 50% decrease. Further analysis showed that the maximum error of values greater than .5 from Eqn. 2 was 0.00917036 and Eqn. 3 was 0.00289144. This is an important distinction because an equation that frequently returns a much higher decrease than 50% has greater potential for the lymphocyte count to fall in the danger zone. In terms of the model neither equation will yield more than a 51% decrease in lymphocytes. These results are summarized in Table 2.

Table 2. Summary of results from Eqn. 2 and Eqn. 3

	Input	Output	Input range that yielded reasonable results	Maximum Error of Values greater than .5	Maximum Error of Values less than .5
Eqn. 2		DD	1-300	0.00917036	0.0146775
Eqn. 3	DD		1-50	0.00289144	0.0146773

Discussion

All parameters were found, except k_2 and α_3 . k_2 , does directly influence AvgHCY, so knowing this value would greatly increase the confidence of the model's output. Similarly the two parameters, k_{EA} and μ , were only able to be extrapolated from the data by inputting various values. $k_{EA} = \mu = .9$ is interesting because it indicates that at each time step 90% of HCY is being eliminated in the liver and the tissues. However since this comes from a relatively small sample further analysis of these parameters would greatly benefit the model. One potential pitfall is the assumption that the amount of HCY in the body is proportional to the amount of aldophosphamide. It is possible that the elimination of the HCY becomes a supply of aldophosphamide; the excretion rate found from the data set could be ignoring some sort of buildup of aldophosphamide in the tissues. Further examining the intricacies of the interplay of the HCY and aldophosphamide would not only give more information on k_{EA} and μ , it would also divulge more information on k_2 . Looking into the mechanical process of a chemical equilibrium would be the starting point.

The existence of α_3 remains theoretical; given Eqn 3, it would be easy to find the corresponding daily dosage if a definitive α_3 was known with the given model. If such a value did exist it would be interesting to do further analysis with the model, taking the variation of the data and several HCY and CY parameters into account and how greatly that would affect the overall model.

Acknowledgements

Thanks to Dr. M. Joy and Dr. G. Charkoftaki for providing insight and guidance in addition to the data set from "Cyclophosphamide and 4-hydroxycyclophosphamide pharmacokinetics in patients with glomerulonephritis secondary to lupus and small vessel vasculitis".

This research was funded in part by the NSF done at Texas A&M under the guidance of Dr. J. Walton. The current research was funded through the McNair Scholars program under the guidance of Dr. M. Shott.

Numerical Optimization

Table 3. Summary of Parameters

Parameter	Interpretation	Value	Reference
K	Max S in a Niche	10	Mangel and Bonsall, 2013
rs	Max rate of S Self Renewal	2.5	Mangel and Bonsall, 2013
rp'	Max rate of S asymmetrical division	0.001	Mangel and Bonsall, 2013
μ_s	Rate of S death	0.004	Mangel and Bonsall, 2013
λ	Rate of MPP multiplication	0.25	Mangel and Bonsall, 2013
θ	Fixed rate of L production	0.3	Friberg [2003]
μ_p	Rate of MPP death	0.25	Mangel and Bonsall, 2013
rcm	Rate of division of CM into L&G cells	0.01	Mangel and Bonsall, 2013
μ_{cm}	Rate of CM death	0.001	Mangel and Bonsall, 2013
rl	Rate of multiplication of L	0.025	Mangel and Bonsall, 2013
μ_l	Rate of L death	0.028	Mangel and Bonsall, 2013
rd	Rate of division of MPP into CM cells	0.2	Mangel and Bonsall, 2013
μ_g	Rate of G cell death	0.003	Mangel and Bonsall, 2013
k_1	Diffusion rate of CY between blood and liver		Joy et al., 2012 *
k_2	Diffusion rate of AP between tissues and liver		Joy et al., 2012 *
k_{EC}	Elimination rate of CY in blood	0.0315	Joy et al., 2012**
k_{AH}	Activation rate of HCY from CY	0.0735	Joy et al., 2012**
k_{EA}	Elimination rate of HCY in Liver	.9	Joy et al., 2012*
μ	Elimination rate of HCY in tissues	.9	Joy et al., 2012*
α_1	Kill rate of MPP dependent on HCY concentration in the tissues	262	Siena et al., 1985***
α_2	Kill rate of CM dependent on HCY concentration in the tissues	90	Siena et al, 1985***
Q	Fitting constant		

*Found from data

** Calculated from given parameters

*** Approximated from shown results

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Attitudes of Sonoma State Latino Students Toward Foreign Language Education

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Abstract

Why do Latino students study foreign language? What are some of their key motivators? These are a few of the questions I address in this study I administered to 38 Latino students at Sonoma State in the fall of 2015. Motivations are a key factor for students to keep studying a foreign language. My survey however, looked for the attitudes of students and whether they were due to their positive experience, this would show if Latino students felt that they were satisfied with their overall foreign language education.

Background

This study began as a reflection on my own experience with foreign language education. In this study, I measure Latino students' attitudes toward foreign language education and document their experience in California foreign language classes. Studying a foreign language might spark an interest for some students in high school, as it did for me; so far I've spent almost nine years studying Spanish as a foreign language because I wanted to improve my writing skills and, more importantly, learn about culture. Through this project, I have realized that only one of my goals for taking a foreign language was achieved: my mastery of vocabulary and grammar. When I decided to study Spanish, I had also expected that I would be immersed in culture and, sadly, was disappointed. I suspect that this may be the case for other Latina/o students. The goal of my research is to understand the reasons why Latino students choose to enroll in foreign language courses. In addition, I want to assess their level of satisfaction with their foreign language courses in high school. In particular, I want to find out whether culture was present in their classes. Throughout my research, I have found that overall Latino students have a positive attitude toward foreign language, whether they are learning one in order to connect with their family or for future educational and career goals. In addition to that, Latino participants who studied a foreign language in high school were satisfied with their instruction. Lastly, I found that students found the most memorable aspects of their foreign language education to be those where culture was present in an activity.

The vast majority of California high schools offer foreign language education. In my high school, only French and Spanish were offered. French and Spanish were among the most popular languages studied in the United States in

public high schools in 2003-2004 (Jorden, 2008). High school students report: “64.3% [taking] Spanish, 22.1% [taking] French” (Stewart-Strobelt, 2003). This same study suggests that a contributing factor to which student exemplify an “integrative motivation play[s] a major role in foreign language selection” (Stewart-Strobelt, 2003). Integrative motivation, “personal affinity for the people who speak a particular language” (Gardner, 1972) may be a contributing factor in why students choose to study a particular language pertaining to family members and or cultural background relating to familiarity of a language other than English. Stewart claims that foreign language teachers who were motivating and captivating, were able to have their students view learning a foreign language as a positive. Together, Stewart and Gardner conclude that in order to match these motivations for both heritage learners and FL learners there is a need for classes to, “be planned in accordance with the motives which are responsible for these studies” (Stewart-Strobelt, 2003). Heritage learners, particularly in this study Latino students, “are learners who have a family and/or ethnic connection to the particular language being studied” (Gardner, 1972). Rachel Reynolds concludes that, “Heritage is not only a widespread motivator for choice of language study, but that heritage also needs to be very broadly conceived ... student motivation for language study in settings with students who have heterogeneous language and culture backgrounds” (Reynolds, 2009).

Gardner and Reynolds claim that students’ cultural background along with the level of familiarity of a foreign language produce motivation and a level of interest to study a language other than English. This research indicates that a final contributing factor into whether students continue their foreign language study had to do with teachers who were able to “change their students’ attitudes toward foreign languages in a positive way” (Stewart-Strobelt, 2003). In other words, foreign language teachers who were motivating and captivating were able to have their students view learning a foreign language as a positive experience. Work on the importance of student-teacher relationships, like that of Alan Brown, indicates that “mismatches between students’ and teachers’ expectations can negatively affect [foreign language] students’ satisfaction with the language class and can potentially lead to the discontinuation of [foreign language] study” (Brown, 2009). This relationship is crucial for students’ motivation in continuing their study of foreign language to which he argues that an important factor their satisfaction with foreign language shifts depending in the teacher-student relationship (Brown, 2009). Student belief in addition to Brown’s additional claim in which, “Students whose instructional expectations are not met may consciously or subconsciously question the credibility of the teacher and/or the instructional approach. . . . Such lack of pedagogical face validity could affect learners’ motivation” (Brown, 2009). Piquemal points out that there are other factors in the continuity of study of foreign language, “[c]ommon interests (family, speech community), and professional (educational institutions) affect learners’ attitudes, expectations, and aspirations toward foreign language” (Piquemal, 2006).

Foreign Language Education

The work of Rachel Reynolds focuses on the first motive. In her study of bilingual students and how they manage being both at home and school as well as the importance of their cultural background, Reynolds concludes that: “Heritage is not only a widespread motivator for choice of language study, but that heritage also needs to be very broadly conceived if researchers wish to develop teaching that harnesses student motivation for language study in settings with students who have heterogeneous language and culture backgrounds” (Reynolds, 2006). Reynolds tells us that because students who have similar cultural backgrounds will greatly benefit if they were taught in the same classroom/s, for example Spanish for Native speakers as some high schools in California have. Current research on ethnicity and the decision to study a foreign language tells us that there must be a connection to said language and or culture, in addition to a motivation a “search of” sentiment to foreign language.

Research also exists about students who are heritage speakers of Spanish, that is Latino students whose primary language is Spanish, but who “have been raised primarily in the United States and educated in English-language schools, and have some amount of exposure to Latino culture”(Thomas, 2008). In her article “Latino Culture and Identity in Spanish Textbooks for Heritage Language Learners” Patricia Thomas concludes that those students take Spanish classes in order to “better” their Spanish grammatically (Thomas, 2008). This statement coincides with my decision to take Spanish as a foreign language. I believe that as a Latino student my desire for further instruction in both grammar and culture in hopes to truly “better” my Spanish, both with my Latino background enabled me to build upon my writing and reading skills.

I found that most of the scholarship about Latinos and language focuses on bilingual education, and on documenting the experiences of students who are learning English as a second language. Some of this research did measure the attitudes that students had about bilingual education. Steven Lee’s study on Latino students and bilingual education, questions in the survey: Do you believe your first/primary/home language would be superior if you were not in bilingual education? 63% of bilingual students answered no. Lee suggests that bilingual students perceive both of their languages to be of equal value. The bilingual education students view that bilingual education as helpful to their educational experience (90%). This correlates very well with their support for bilingual education (86%). Many language acquisition scholars also point out the importance of students developing some level of cultural competence as they learn a foreign language (Brody, 2003; Storme, 2006). In her article “A Linguistic Anthropological Perspective on Language and Culture in the Second Language Curriculum,” Jill Brody argues that culture is almost too frequently “taken for-granted” and therefore, not implemented in foreign language classrooms. Brody tells us that it is crucial for cultural competence to be integrated into foreign language learning; if not “the results may fall short of the standards of either cultural relativism and linguistic accuracy” (Brody, 2003). A similar view is espoused by Julie Storme in “Culture as the Core: Perspectives on Culture in Second Language Learning.” She argues that cultural

competency is essential in learning any language and that it is essential that culture is implemented in classroom practices. Anthropologist Robert Lafayette believes that language and culture must be integrated as one, even as he acknowledges that in most classrooms culture remains the “weakest component due to uneven practice.” Like Reagan, Lafayette believes that the absence of cultural context in foreign language instruction contributes to students’ overall negative attitudes toward their foreign language education.

While the importance of cultural competence is stressed both by language acquisition scholars and by California state standards (Foreign Language Frameworks), it is not necessarily something that is present in foreign language classrooms. Some have argued that this is due to the fact that the levels of proficiency in the standards are too overwhelming to be applied (Brynes, 1991). Proficiency levels require that students be able to “participate in everyday social interactions” as well as converse, argue, criticize, request, convince, and explain effectively (Foreign Language Frameworks). Many foreign language classes are too fast paced for this to happen, “Many teachers say: “Culture is not language so why should we have to deal with it?” (Lange, 2003) as if to say any culture component seems to be extra.

Given the existing literature on language acquisition and on Latinos and foreign language courses I hypothesize that students who identify as Latino will have a positive attitude toward learning a foreign language. In addition, I believe that one of their main reasons for studying foreign language will relate to culture and family. Furthermore, Latino students taking foreign language will rate their foreign language classes as satisfying. Regarding their experiences in the classroom, I hypothesize that Latino students enjoy foreign language classes most when they have a cultural component.

Methodology

I conducted my research in the fall of 2014 at Sonoma State University. I used a qualitative survey with a Likert scale in order to measure students’ attitudes toward foreign language education and their level of satisfaction with their high school foreign language classes. I decided that this format would enable me to how a large sample of Latino students at Sonoma State University view foreign language education. It would also be more efficient than finding Latino students who were available for a (longer) face to face interview. The survey consisted of four sections. The first asked respondents to provide demographic information, including age and gender, and asked them to self-identify their ethnicity/race. The second section was designed to measure attitudes toward foreign language education and student motivations for learning a foreign language. The purpose of this section was to gauge whether participants perceived foreign language education to be useful or unnecessary. This section also contained questions regarding the reasons why participants enrolled in high school level foreign language classes. The second section of the questionnaire asked them to evaluate their actual experienc-

Foreign Language Education

es in foreign language classrooms. It contains statements that students are asked to agree or disagree with. The statements were compiled from existing research on the effectiveness of foreign language practices (Surveys of foreign language, Johnson, Gardner, Garcia, Jordan, Vilke). Students were also asked whether they found their high school foreign language classes to be satisfying. The final part of the questionnaire consisted of two opened-ended questions that asked students to self-report what they most liked and disliked about their high school foreign language classes. This section also included a scale that asked participants to assess their fluency in reading, writing, and speech at the end of their foreign language education versus what students' envisioned their fluency to be prior to their commencement their foreign language education.

My study focuses on Latinos and foreign language education, and given the demographics at my research site, in 2011 Sonoma State ethnicity was made up of 66.1% White, 21% Hispanic, 5% Asian, 3% African American, and 4% who declined to state (Sonoma State Quick Facts), I felt it was very important to choose the sites for my survey carefully. I reached out to an upper division Spanish foreign language class, which I assumed would likely contain students who had studied Spanish or another foreign language in high school, so if they continued to do so at the college level they must have had a positive experience.

I also wanted students who were not studying a foreign language during college. I sampled a Chicano and Latino Studies general education upper division class. The fact that it was a Chicano and Latino Studies class was deliberate, as I felt that it was a place where I would most likely find Latino students to participate in my study. My sampling strategy was successful. The breakdown by ethnicity of the 50 students who completed my survey was as follows: 76% Latino, 14% White, 2% Asian, 2% Black, 2% Middle-Eastern, and 4% who declined to state. This is very un-proportionate to Sonoma State's ethnicity; with only 38 of my participants were Latino about more than half. However, I did capture Middle-Eastern students who are not represented in the Sonoma State ethnicity fact page. In terms of gender, 68% of participants identified as female and 32% as male. This breakdown by gender is slightly higher in female representation Sonoma State (Sonoma State Quick Facts) (62.9% Women and 37.1% Men). This is not a gender factor since the gender representation in my survey is fairly close to that of Sonoma State's. I believed that I would be crucial for my participants to have had recent experience with foreign language so I restricted the age range of the surveys I considered. I wanted participants who had taken a foreign language course within the last four years.

The median age of participants was 21 (53%), 20 and under (24%), and over 22 years (23%). While I grouped all students who identified as some type of Latino together, not all of them actually used the term "Latino" to name themselves. Of the participants who could be described as Latino, only 21% actually self-identified as such. 32% identified as Hispanic, 16% as Mexican- American, 10% as Mexican (10%), 10% used more than one definer, 8% listed a nationality other than Mexican (Salvadorian, Guatemalan), and 3% identified as Chicano (Fig

1). Because of this, I decided to focus not just on Latino students' attitudes as a whole, but also considered the attitudes of each subgroup within the Latino category.

Findings

In the first part of the survey I measured participants' attitude toward foreign language education by asking them to respond to a series of questions using a Likert scale. It is also important to note that all of my participants took a foreign language while in high school. 84% of Latino students disagreed with the statement "people who know English don't need to know a foreign language," 11% had no opinion, and 5% strongly agreed. I was surprised by the fact that any strongly agreed and decided to further break down responses based on how students reported their ethnicity. Students who named themselves by nationality, as Latino, or as Mexican-American consistently disagreed from 84%-100%, whereas students naming themselves as either Mexican or Hispanic students strongly agreed with this statement (50% and 9%). Another question that I used to measure attitudes toward the study of foreign language was "it is important to learn foreign language and its culture." 95% of Latino students agreed and only 5% strongly disagreed. 95% of participants agreed regarding the importance of learning about another culture and its language. 70% of students reported that they chose to take a foreign language because they were interested in an aspect of the traditional culture associated with that language, however 9% of Hispanic and 17% of Mexican-American respondents disagreed with this statement. 70% of Latino participants agreed that they took foreign language in order to connect with their family. The breakdown by self-reported ethnicity for those students who either agreed or strongly agreed with this last question was as follows: 75% Mexican, 73% Hispanic, 71% Latino, and 67% of Mexican-American.

The survey also generated information about participants' experiences with foreign language education in California public schools. 100% of Latino respondents believe that having a good teacher is important when learning a foreign language. 56% disagreed that what they did in their foreign language classes were boring but 14% agreed. Participants who identified by national origin other than Mexican (Salvadorian and Guatemalan) (33%) or as Hispanic (20%) were those most likely to have found what their courses boring. 89% of participants either agreed or strongly agreed that they were satisfied with their foreign language education. Of those that disagreed, the strongest level of dissatisfaction was among students who identified by national origin (33%), although some Latino (14%), and Mexican-American (17%) respondents also disliked how foreign language education was taught at their school.

In the open-ended portion of the survey I asked students what they had most liked and most disliked about their foreign language classes. I noticed some patterns emerging. Overall students liked that they had learned grammar and "ex-

Foreign Language Education

and[ed] on knowledge” within the language. Instances when their class involved any aspect of Latino culture seemed to be the most memorable. A total of 18 students in the open-ended portion of the survey mentioned culture, whether it was “mixing,” “learning,” and or something having to do with “traditions.” Students were also largely satisfied with their teacher (i.e. teaching skills, the structure, classroom atmosphere). I found quotes similarly along the lines of liking, “The way the teacher explain[ed] and [taught] the class” (Student #42, 21 Year-old). Among the things respondents disliked was the fact that the Spanish they were learning was not one of the varieties commonly used in the United States but Castilian; also mentioned were reports of teacher unfairness and the difficulty in the “never ending conjugations”. A total of two students mentioned this and felt very strongly about the Castilian portion within their foreign language education enough to voice that this particularly disliked the most.

Analysis

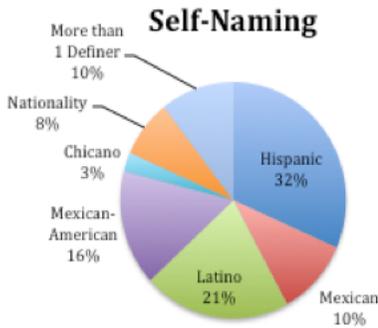
Latino students at Sonoma State in this study have a positive attitude towards their foreign language education in high school. With strong attitudes in associating culture and language is an important finding. This data definitely supports my first hypothesis that students who identified, as Latino would have a positive attitude towards foreign language. 81% of Latino students chose to take a foreign language because they know it will be important part of their career. This motivated students because it related to their academic goal. In addition, by acknowledging and giving time to learn another language is an important skill as well as an asset in any field of work. More than 50% of students agreed that they wanted to learn culture associated with the language they were studying as well as using the language to connect with their family, which proves that students who wanted to learn a foreign language in high school did so with these motivations in mind. Surprisingly, Latino students found their foreign language education to be satisfying. A total of 86% of Latino students agreed, with 6% disagreeing, and 8% with no opinion. By far, I believe that this was the question in which I was most interested. In my own foreign language experience, I felt that because my foreign language education lacked a cultural component, it was unsatisfactory. In association with that, 73% of students liked the way their foreign language was taught in their high school. Although, this is not near the same percentage as the question regarding satisfaction: presumably 73% of the 86% of students satisfied with their foreign language liked the way their foreign language was taught at their school.

Conclusion

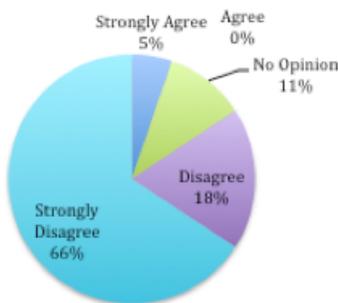
Latino students surveyed at Sonoma State have a positive attitude towards foreign language. Clear motivations like family and future goals were key motivators in continuing the study in foreign language for Latino students. Overall, Latino students had positive attitudes towards foreign language; there was a va-

riety of responses to every question in this survey measuring their attitudes and experiences in their foreign language experience. Latino students in my survey ultimately had positive attitudes towards foreign language. They were interested in learning about culture, to which they believed it was important, but many students are not receiving enough. Today the approach to foreign language education does not result in communicative competency, and there is an absence of culture and cultural competency within foreign language classrooms in the United States. Consequently, students are not being well prepared in foreign language.

Appendix
Figure 1



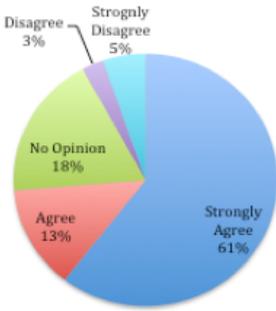
People who know English don't need to know a foreign language



Survey Question 1
Negative
Latino Students In General

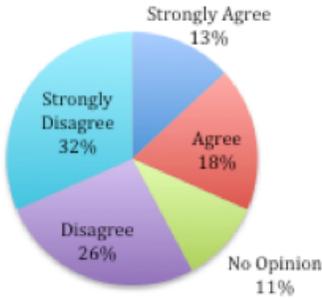
Foreign Language Education

Someday I would like to study abroad



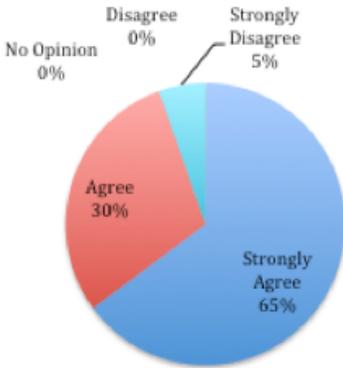
Survey Question 2
Pragmatic/ Goal Oriented

I chose to take a foreign language because it was mandatroly for college applications.



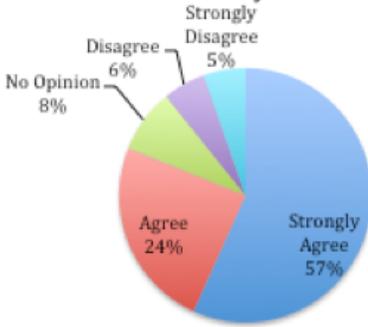
Survey Question 3
Negative

It is important to learn foreign language and its culture.



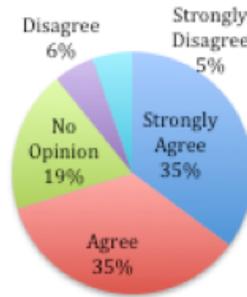
Survey Question 4
Positive/Family

Studying a foreign language is important to me because I'll need it for my future career



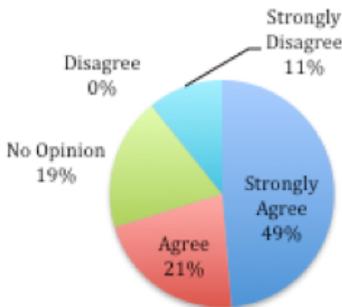
Survey Question 6
Pragmatic/ Goal Oriented

I chose to take a foreign language because I am interested in an aspect of the traditional culture associated with taht language



Survey Question 7
Positive/ Family

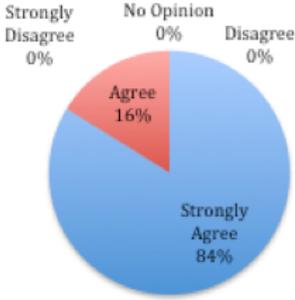
I wanted to use this language to connect with my family



Survey Question 8
Positive/ Family

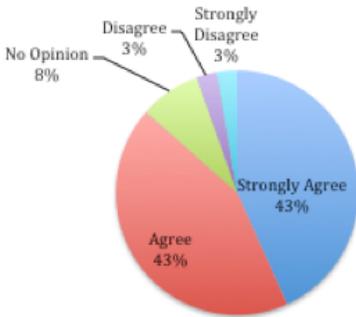
Foreign Language Education

Having a good teacher is important to being successful at learning a foreign language.



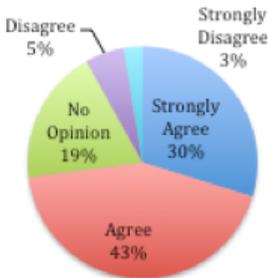
Survey Question 10

I found my foreign language classes to be satisfying



Survey Question 14
Positive

I liked the way my foreign language was taught at my school.



Survey Question 16
Positive

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The Role of Non-Catalytic Cysteine Residues in Controlling the Sensitivity of Protein Tyrosine Phosphatases to Oxidation

Juliet Bartleson, Biology

Research Mentor: Joseph Lin, Ph.D.

Abstract

Protein tyrosine phosphatases (PTPs) are important in a multitude of signaling pathways. All PTPs contain a catalytic cysteine residue within their active site, which is essential for phosphatase activity. Importantly, the thiol (R-SH) of the catalytic cysteine must be in the reduced state to confer phosphatase activity. Because of their unique biochemical properties, cysteine residues are vulnerable to oxidation. In this study, we investigate the role of non-catalytic cysteines in controlling the sensitivity of the PTP, CD148, to oxidation. Previous studies with other phosphatases have shown that some non-catalytic cysteines can form disulfide bonds with the active site cysteine protecting it from irreversible over-oxidation. To test this hypothesis, we mutated two non-catalytic cysteines in the phosphatase domain of CD148. The mutated PTPs were then expressed in *E. coli* and purified. Finally, the PTPs were treated with varying concentrations of H_2O_2 , a potent oxidant, and then reduced with 50mM DTT. Using a pNPP assay to assess enzyme activity, the wtCD148 protein was shown to recover a greater percent of maximal activity in the $10\mu M H_2O_2 + 50mM DTT$ treatment than any of the other mutated recombinant proteins. This could indicate the wtCD148 protein experienced less irreversible over-oxidation compared to the mutant proteins, which would support our hypothesis that non-catalytic cysteine residues can form disulfide bonds with the catalytically active cysteine, protecting CD148 from irreversible over-oxidation.

Introduction

Protein tyrosine phosphatases (PTPs) are known to play a vital role in T cell activation signaling pathways. PTPs contain a catalytically active cysteine residue that must be in the reduced thiolate (Cys-S⁻) form in order to confer protein activity (Karisch, 2013). While the low pKa (4.5-5.5) of the cysteine is essential for the activity of the enzyme, it is also what makes PTPs especially vulnerable to oxidation (Karisch, 2013). Oxidation of PTPs renders the proteins inactive, due to a deviation from the reduced thiolate state, and T cell signaling is subsequently affected.

Reversible oxidation of PTPs has been proposed as a regulatory mechanism utilized by the cell upon activation in order to repress PTP activity so that there can be uninhibited transduction of cellular signaling (Rhee, 2003). The problem is that cysteine can exist in varying states of oxidation, some of which are reversible and others of which are not. When the cysteine is irreversibly oxidized, the result could potential-

Protein Tyrosine Phosphatases

ly lead to disease states due to the affect it would have on T cell activation signaling.

Oxidation of cysteine results firstly in the formation of sulfenic acid (Cys-SOH), followed by sulfinic acid (Cys-SO₂H). These states can be reversed by natural reducing agents in the cell, such as glutathione (GSH) and sulfiredoxin. Once in the sulfinic acid state, the cysteine can become over-oxidized into the biologically irreversible form: sulfonic acid (Cys-SO₃H) (Tonks, 2005). However, another possible fate of cysteine from the sulfenic acid state is to form a disulfide bond (Cys-S-S) in order to protect the cysteine against over-oxidized states (Karisch, 2013).

The purpose of this research was to investigate the role of non-catalytic cysteine residues in controlling the sensitivity of PTPs to oxidation via their ability to form disulfide bonds with the catalytically active site cysteine. To do this, we mutated the non-catalytic cysteine residues of CD148, a transmembrane PTP involved in proximal T cell signaling. By mutating the non-catalytic cysteine residues to serine, we inhibited the possibility of disulfide bond formation, allowing us to perform enzymatic activity assays in varying oxidative states to compare the mutant protein results against the wildtype protein results. Furthermore, after oxidation of the mutant proteins, we attempted to recover activity using a strong reducing agent (DTT) to see if irreversible over-oxidation was in fact induced, and whether or not there was more of it in the mutant proteins versus the wildtype protein.

Methods

Mutation of Non-Catalytic Cysteine Residues

The non-catalytic cysteine residues were mutated using a Polymerase Chain Reaction (PCR) technique for site-directed mutagenesis (Reikofski, 1992). We developed primers to overlap with the second (C#2) and third (C#3) cysteines in the phosphatase domain of CD148. We designed a single point mutation in the primers that coded for an amino acid change of cysteine to serine (TGT → TCT) on the cDNA. Forward and reverse primers were used to obtain fragments of the cDNA that contained the mutation, and then the fragments were combined in a separate PCR reaction to obtain the cDNA of the full phosphatase domain of the protein with the cysteine to serine (C → S) mutation at the cysteine sites C#2 and C#3 separately. Those two mutations were then combined to form a protein with both C#2 and C#3 mutated to serine. The recombinant protein was then sequenced to verify successful mutations. The PCR mutagenesis process is depicted in Figure 1.

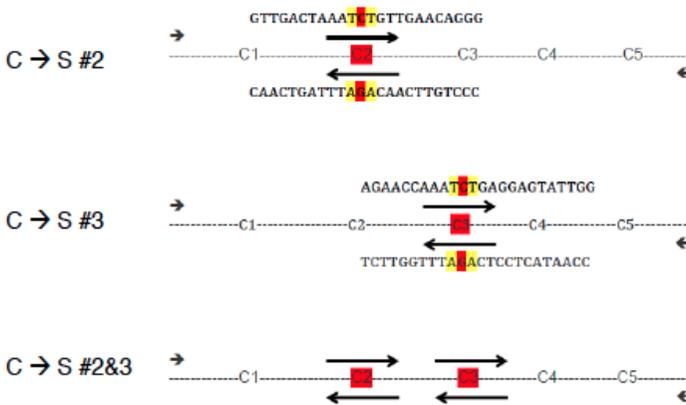


Figure 1. A visual representation of the PCR procedure, including the primers used to create point mutations in the cysteines.

Expression and Purification of Recombinant Protein

The mutated cDNAs (C→S#2, C→S#3, and C→S#2&3) were ligated into plasmids and then transformed into competent *E. coli* along with a wild-type plasmid. The transformed bacteria were then induced with 1mM IPTG after 4 hours of incubation to produce the recombinant protein. The bacteria were lysed, and QIAGEN Ni-NTA spin columns were used to purify out the His-tagged proteins from the lysate. A Bradford assay was performed to determine relative protein concentrations among the eluted samples, and the products were finally assessed using SDS-PAGE to determine purity and concentration.

Enzymatic Activity Assay

All samples (C→S#2, C→S#3, C→S#2&3, and wtCD148) were exposed to three treatments: no H₂O₂, 10μM H₂O₂, and 100μM H₂O₂. After room temperature incubation for 15 minutes, catalase was added to all treatments. Using a 96 well plate, 0.2μg of protein was then tested in wells that contained either 50mM DTT or no DTT, as depicted in Figure 2. Subsequent enzymatic activity was assayed using 5mM pNPP as an exogenous substrate, and absorbance was read at 405nm.

Protein Tyrosine Phosphatases

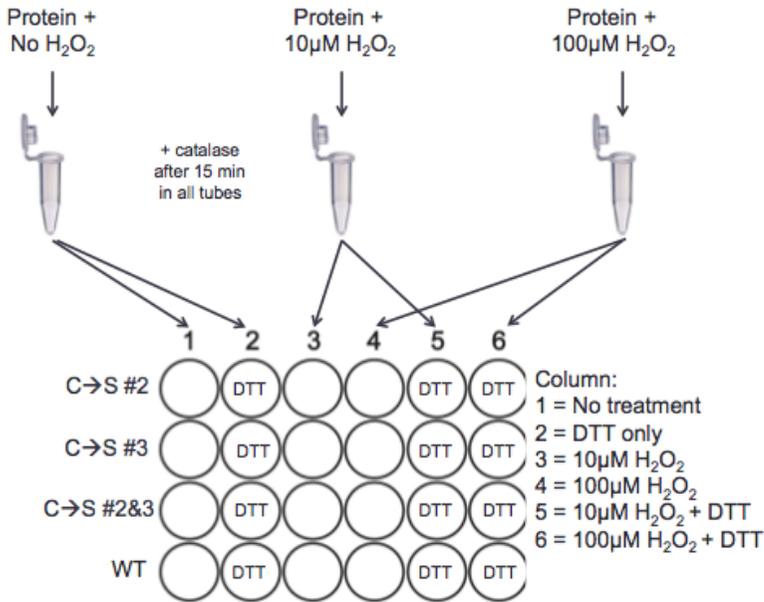


Figure 2. An illustration of the enzymatic activity assay used to assess the recombinant proteins in varying states of oxidation.

Results

Mutation of Non-Catalytic Cysteine Residues

As seen in Figure 3, the mutation of the non-catalytic cysteine residues to serines was successful for all three mutated recombinant proteins: C→S#2, C→S#3, and C→S#2&3. Also, the recombinant wtCD148 protein sequence was verified. It is important to note, however, there was a random mutation in the C→S#2 reaction that caused an amino acid change Lysine→Arginine.

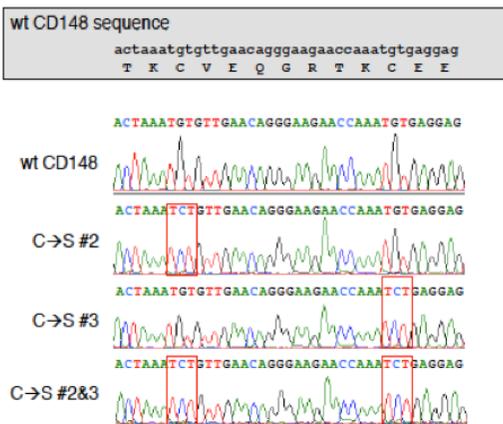


Figure 3. A chromatograph depicting the successful mutation of the cDNA

Expression and Purification of Recombinant Protein

The SDS-PAGE image in Figure 4 shows the successful expression and purification of the recombinant proteins.

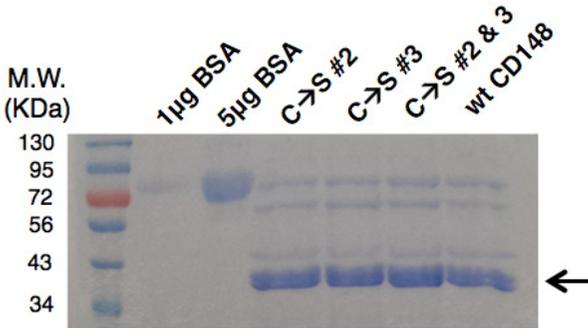


Figure 4. SDS-PAGE was used to assess the recombinant proteins for purity and concentration.

Enzymatic Activity Assay

Figure 5 shows the results of the pNPP assay used to assess the enzymatic activity of the proteins. The fully reduced state (DTT only) conferred the highest level of activity for each of the proteins, and the wtCD148 showed the greatest activity in that treatment. When exposed to $10\mu\text{M}$ H_2O_2 , all of the protein samples decreased their activity level, and when exposed to $100\mu\text{M}$ H_2O_2 there was a much greater decrease in enzyme activity. When we tried to bring back activity with DTT after exposure to $10\mu\text{M}$ H_2O_2 , the wtCD148 had a much higher percentage of maximal activity than the mutated proteins did. We were not able to bring back any activity in any of the protein samples after exposure to $100\mu\text{M}$ H_2O_2 .

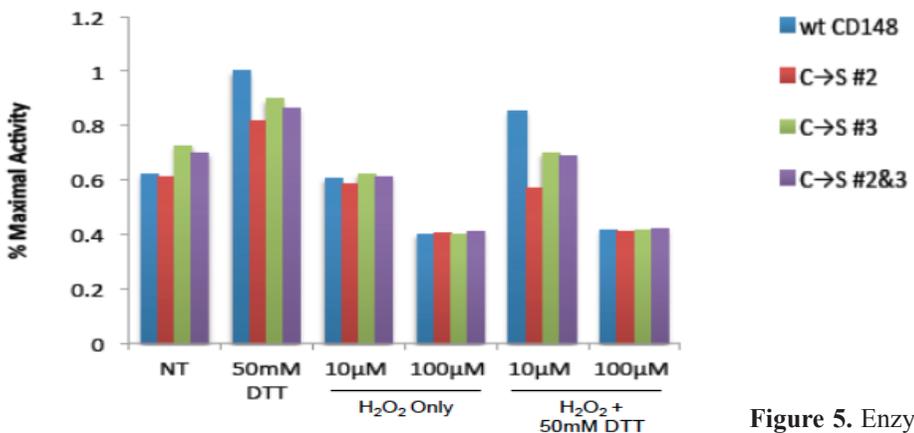


Figure 5. Enzymatic activity was assayed using pNPP as an exogenous substrate, and reading the absorbance at 405nm. This graph depicts the 8min readings.

Discussion

After subjecting the recombinant proteins to the enzymatic activity assay, we were able to see some results that supported our hypothesis that the #2 and #3 cysteines in the phosphatase domain of CD148 could form a disulfide bond with the catalytic cysteine, protecting it from irreversible over-oxidation. In Figure 5, we can see that activity of the wtCD148 protein was recovered at a much greater rate in the 10 μ M H₂O₂ + 50mM DTT treatment than any of the other mutated recombinant proteins. This could indicate that wtCD148 experienced less irreversible over-oxidation compared to the mutant proteins. Furthermore, the decreased amount of irreversible over-oxidation could be attributed to the fact that wtCD148 was able to form disulfide bonds with the non-catalytic cysteines that were mutated in the other proteins.

What is contradicting to our hypothesis in our results, however, is the C \rightarrow S #2 mutant protein had no recovery of activity in the 10 μ M H₂O₂ + 50mM DTT treatment, while the C \rightarrow S #2 protein did. According to our hypothesis, we would have expected the C \rightarrow S #2 protein to have a worse percent of maximal activity recovered than the C \rightarrow S #2 protein. As noted earlier, the C \rightarrow S #2 recombinant protein had a random amino acid change, a Lysine to an Arginine, caused by the PCR site-directed mutagenesis method. While this change appeared to be at a place in the DNA sequence where it would not affect enzyme activity, perhaps there is some anomaly occurring in this data due to that random mutation. In the future, we would like to re-do the PCR technique to produce a mutant C \rightarrow S #2 recombinant protein without the random mutation.

To further investigate the role of non-catalytic cysteine residues in controlling the sensitivity of CD148 to oxidation, we would like to mutate the other two non-catalytically active cysteines in the phosphatase domain of CD148. This will allow us to determine the subsequent effects on enzymatic activity and oxidative sensitivity for all of the non-catalytically active cysteines, and it will help us determine whether one non-catalytically active cysteine site is more critical in helping to protect CD148 from irreversible over-oxidation than the other sites. We would also like to do further enzymatic activity assays using GSH, the biological reducing agent in cells, as well as using a fluorescent exogenous substrate (FDP) to obtain more accurate results.

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Restorative Justice Volunteers

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Research Mentor: Patrick Jackson, Ph.D.**

Abstract

Similar to other jurisdictions across the country, the justice system in Sonoma County has been changing its response to juvenile rule violations through increased reliance upon programs adhering to restorative justice principles. Restorative justice puts *victims'* needs at the center of the process (Zehr, 1995), while placing *offenders* on a path of reintegration by requiring that they be responsible and accountable. It simultaneously incorporates a third pillar, the *community* (Souza, 2008), as defined in good part by volunteers who contribute their time and voice and define the nature of local society in that process. In this exploratory study we examine the experiences and characteristics of the volunteers who provide the essential support and primary linkage to the community involvement that is central to the mission of restorative justice. The study uses open-ended interviews to learn more about volunteer motives for involvement, perspectives on their training and work, their views about community, and how they feel they are having a meaningful influence on victims, offenders, and local community. In addition, an online survey was completed by volunteers to supplement the information gathered from the interviews.

Introduction

Today there is a lot of discussion in the field of criminology about the best way to respond to offenders who break laws and rules. In the past few decades the pendulum of thinking about how to deal with offenders has swung from rehabilitation to “just desserts.” Politicians have passed laws abolishing parole, enacted determinate or flat time sentencing, mandatory minimums and, more recently, habitual offender laws such as three strikes. They have also passed laws and rules that make the adjudication of juveniles and adults more similar. One result of these and other policy decisions is a dramatic increase in reliance upon costly incarceration and/or no tolerance policies.

In recent years there is some evidence that the pendulum may be moving away from the punitive policies and mass incarceration that have led to revenue deficits. Researchers show that lengthy incarceration policies are ineffective at touching ridiculously high recidivism levels, and the recurrence of criminality and delinquency in impoverished areas continues unabated. In fact, in some jurisdictions, local officials are trying out new ways of processing young offenders that do not directly involve mainstream criminal justice procedures. One such intervention is restorative justice (Dhami, 2007), a response to crime developed in New Zealand and elsewhere that is now used around the world in response to juvenile and

some adult offending (Umbreit, 1999).

In criminology textbooks, restorative justice is viewed as a radical or critical theory or, at a minimum, an alternative to the criminal or juvenile justice system response to delinquency, crime, or rule breaking. As its use has become more common and researchers have examined it more closely, studies are finding that it is more of an alternative or complement to conventional processing rather than a radical departure from the system. Several studies have found that it is a more satisfying process for victims and other parties than traditional processing. Although the practice has been criticized Zehr (1972), there is clear evidence that the practice is successful among its participants, both in terms of their satisfaction with the process and outcomes as well as the recidivism levels of individuals who pass through it (e.g., McGarell & Hipple, 2007; Rodriguez, 2007; Umbreit, 1999).

We can gain some insight into why restorative justice may be a satisfying or rewarding practice by briefly describing the fundamentals about it. As Zehr (1972; Zehr & Mika, 1998) has noted, the theory of restorative justice is concerned with the victim, the offender(s), and the community. The victim is the person or group harmed and the concern of the process is the healing of the victim. This is done through a process, such as a restorative conference or a circle that involves the offender and the community. The offender plays an important role by being responsible and accountable. However, the community also can play a key role in this process. A community is often affected by crime and as such must be involved in the interplay of offenders, victims, and the community response as individual cases are resolved. This contrasts with traditional processing of offenders, which is concerned with meting out punishment in the name of the state.

In light of the finding that restorative justice programs are often found to be very effective, this study attempts to contribute to the study of how to interpret why this happens. More specifically, it is about why people decide to become volunteers and what this means for the theory and practice of restorative justice. The goals are to learn about the motivation to become volunteers, what they find rewarding about it, to describe who volunteers are, and to understand how they feel they are affecting the community. Given that the broad purpose of restorative justice is to make things right for victims through involving offenders and the community in the process, the questions that guide this study are: Why do volunteers get involved in restorative justice? How do they represent the community in restorative processes? What do they get from that involvement as people and citizens? The answers to these questions will provide some basis for later discussion of the relation between volunteering and the theory of restorative justice.

Prior Research

Researchers have examined several issues surrounding volunteers in Canada. Dhimi and Joy (2007) conducted a study in Canada that focused on the volunteers of restorative justice and the challenges involved there, such as recruiting

Restorative Justice

and training volunteers. This was a change for the government to use restorative justice and the research found that it reduces costs. The volunteers there were dedicated and embraced the principles of restorative justice. Many of the volunteers' were retired citizens since they had more free time and flexibility than others in the community. Many of these volunteers had also volunteered in other agencies. The study finds that when recruiting volunteers, volunteer time commitment is an important factor, as well as recruiting a diverse population, the latter of which promotes inclusiveness by meeting the needs and wants of victims and offenders.

Souza and Dhimi (2008) also studied seventy-six volunteers from twelve different programs in Canada, using a self-report survey with a response rate of sixty-nine percent. They aimed to discover the characteristics of the volunteers, document their level of involvement, motivations, skills, and their training. Another goal was to learn what influences the satisfaction of the volunteers. The main reason they find people volunteer is based on their personal values. The younger volunteers are more linked to volunteering for career related reasons. Many of the volunteers had an education and qualifications that are directly related to restorative justice, such as policing, corrections, counseling, childcare, social work, mediation, and psychology. These volunteers received training in a variety of issues, such as abuse, substance use, mental health, conflict resolution, personal safety, listening, cultural diversity, sexual abuse, and many others.

Karp, Bazemore, and Chesire (2004) examined community volunteers who were currently serving on reparative boards in Vermont. This research took four months to collect data from 229 participants, a seventy-eight percent response rate. They found the volunteers' motives were to help troubled youth with their lives and to support and build a better community. Volunteers had a strong sense of community and felt that it was important to give back to the community. They found that the volunteers were a median of fifty-four years old, and nearly all white. They were also well educated: forty-two percent had graduate or professional degrees. The majority of volunteers were moderate in their political orientation and religion was somewhat to very important for the majority. Most had also been a member of the reparative board for more than a year and forty percent more than two years. A majority felt that they were restoring the victims and that it is better than traditional probation in regards to the victims. Ninety percent believed that the offender understood the harm of the offense and a majority thought the offenders were remorseful. In their interpretation, volunteers may provide a mechanism for community influence that has the potential to have a greater positive influence on participants than traditional criminal justice practitioners because they as people are present in an unpaid capacity, may represent a kind of "moral voice of the community," do not have to juggle the competing interests that justice professionals do, who may have local, informal knowledge of community, and can thus provide a form of familial social control. They may, as a result, provide a vehicle for democratizing the response to crime. A major conclusion of their study is:

Although any model of restorative conferencing—whether family group conferencing, victim-offender dialogue, peace making circles, or reparative boards—has the potential for such democratization, those approaches that routinely involve a wide array of community volunteers would appear most likely to change the decision-making dynamic and thereby have the greatest potential for maximizing sustained community involvement (p. 507).

Karp et al. (2004) find that volunteers are demographically different from the offenders, more related to socioeconomic status than by race or ethnicity. Their volunteers were of a higher socioeconomic class, as well as older. Although the work of Goddard and Jacobson (1967) predates the more recent movement in restorative justice, this study of Oregon juvenile justice system showed volunteer participation in the justice system had many benefits. These benefits existed because the volunteers had roots in the community in a way professionals did not and could relate to the situations the juveniles had been in in a better way.

Settembrino (2013) conducted a qualitative study of restorative justice volunteers in community boards. Volunteers in Florida encouraged youth to make better choices in the future, which amounted to living up to middle class ideals in Florida. The contradiction here was that the volunteers were mostly from the white middle class, but the offenders were from a lower socioeconomic class, which created many obstacles for them to reach the American dream.

Looking at volunteering in general rather than in restorative justice in particular, Howell, Lee and McBride (2014) have recently focused on older persons in a wide range of volunteer roles and the impact of their efforts on local communities. Their study shows overwhelmingly that volunteering changed their lives in a positive way. For example, between two-thirds to four-fifths had said they were now much more likely to do things outside of their house, that they learned new skills and knowledge, increased their confidence, and that they improved their realization of the importance of daily organized activities. A study by McAdams (2001) showed that older volunteers were motivated differently than younger volunteers. The younger volunteers were motivated by more career experience, and “giving back” motivated the older volunteers. Similar findings were also reported by Souza and Dhimi (2008), noted above, in their study of restorative justice volunteers.

Methods

Initial contact with Restorative Resources in Santa Rosa, California was made with the Director, who gave permission to conduct the study, and the Volunteer Coordinator, who provided the information needed about the volunteer program. This study planned to use a mixed methods approach to collect data. First, interviews were to be conducted with volunteers and then this would be followed by an online survey of all volunteers. After obtaining human subjects clearance,

Restorative Justice

the researcher requested names of volunteers who had been through volunteer training and who had been consistently involved in volunteering for one or more years. The subjects for in-person interviews were chosen from the list of current volunteers provided by the coordinator.

Respondents were asked whether they would be willing to be interviewed for a study being conducted by a student from SSU. Interested volunteers emailed the researcher, who subsequently contacted them to arrange an interview. All those who replied were interviewed. Because all of the initial interviewees were white adults in their late 40s or older, the researcher then made efforts to obtain possible interviews with ethnic minorities and in the end was able to interview two Latinos.

Altogether ten volunteers were interviewed. The interviews started in September 2014 and ended in October 2014. They were asked a series of open-ended questions (see Appendix, Exhibit A) in interviews that lasted between 10-20 minutes. Most of the interviews were in person at Restorative Resources, or at a coffee shop, but a few were over the phone. The purpose of the interviews was to get qualitative information about why they volunteered and what effect they thought they had in the restorative processes involving the victims, offender, and the community.

These interviews were subsequently transcribed and coded so as to indicate significant themes in response to the open-ended questions. In addition to these interviews, the author also attended a restorative conference to learn more about the role of volunteers in the process. The conference involved a victim, volunteer facilitator, and various impacted parties, including other volunteers. The researcher was able to speak in depth with the volunteers, Program Manager, Volunteer Coordinator, and intern at various times during the study to get different perspectives on the program from various people outside of the formal interviews.

Subsequent to this, the final step in obtaining data was through responses to an online, thirty-two question survey. Of the forty total volunteers who participate at Restorative Resources, twenty-two or over half of the volunteers completed usable surveys.

Choice of Interview. Location. Respondents chose the location they felt most comfortable for the interview. We mostly met at Restorative Resources, then coffee shops, or phone interviews. In addition to the interviews I was also able to sit in on a conference at Restorative Resources.

Sample Selection. Emails were sent to all the volunteers, including those from six different restorative councils. I conducted interviews and surveyed those who were willing to be part of this research. I had to proactively ask the Restorative Resources coordinator to get minority volunteers to be interviewed. They ended up being two Latino men.

Recording and Coding of In-Person Interviews. Information was recorded during the interviews on a portable digital recorder. Next, the recording was

transcribed onto a computer, and printed. Then the transcriptions were coded to find relevant information and common themes. The research interviews started September 17th, 2014, interviewing one participant at a time. The last interview was October 22nd, 2014.

Findings

In-Person Interviews. Several common themes emerged from the interviews. Volunteers all cared about the community and most had volunteered before joining Restorative Resources. Volunteers were emotionally invested in the youth, and they wanted to help the victims and the offenders get through this event. All the volunteers talked about how *the current justice system is unjust*. This appeared in varied forms. The following quotes are from volunteers who mention the justice system:

“Law enforcement have seen, that I have a blonde, blue eyed son who gets treated totally different than the Latino and black men”

“I have noticed many of the kids that come to us are Caucasian and I am wondering about racial makeup between who gets to come and who doesn’t”

The first quote above is from a mother who had witnessed her “white” son being treated much kinder than his “minority” friends by law enforcement. The other quote was from another female volunteer commenting on her perception of “whites” being chosen at higher rates by the judge to participate in Restorative Resources.

The quotes below are from male volunteers who believe that the justice system is currently unjust. The first volunteer saw the police and the justice system having issues of being racist, the following volunteer believed the issue was more with the system.

“The justice system and police and I see you know my personally belief there is a lot of racism it’s not just my personal belief, it’s data.”

“We talk to probation officers that really want to help and don’t want to see kids fail. I think a lot of it is the talk, I think that’s the problem I think it’s the system that’s the problem.”

The volunteers mentioned that injustice is due to socioeconomic status and/or racial discrimination. The volunteers had training on cultural awareness, which they mentioned helped them learn about cultures different from their own.

Another common theme was *accountability*. The volunteers thought it was very important for the offenders to be accountable and responsible for their

Restorative Justice

actions and to own what they had done. The youth needed to realize and understand their impact on the community, and how they hurt the victim and everyone involved. A couple of quotes from the volunteers show how the processes they are involved in make the offender accountable for his/her actions,

“...It helps the offender look at many different sides of the situation that he or she hadn’t considered before.”

“Kids should be able to hear from the victim and talk about impact and hear about impact and try to make things right because that’s humanity.”

This is a part of how they believed the wrong could be forgiven and the offender could be truly remorseful.

A third theme that came up throughout the interviews was a *sense of community*. From their perspectives, the volunteers felt like they were a part of the community and had a duty to help serve it by volunteering. This conception of community was quite expansive and included different social classes and ethnicities. The older white volunteers felt a sense of community with the young Latinos who participated in the program. Some quotes from a white middle age male show how important the community is to the youth,

“These young people have broken relationships with the community and...they need to acknowledge that”

“[Incarceration] creates a barrier between the young person and society and it’s just a huge waste of resource”

“What we need to do is to return them to the society.”

The volunteers were aware of the obstacles to integration into the community that many of these young offenders faced and thought it was important to address them. Here is a quote from a Hispanic male about his discussion with the police chief,

“[The Police Chief] had another idea and wanted us to come every time there was a problem with police and community”

“to give another perspective in the circles from the law enforcing would be very valuable also so kids who are getting in trouble can see that the police are humans.”

Many of the volunteers felt privileged that they didn’t have to face the same obstacles as others had in their life. There was much talk of sub communities such as the Latino community in many of the interviews.

The last common theme that was important in the interviews was *creating a change*. Many volunteers had mentioned that they thought the current justice system involving juveniles needed more restorative justice and less punishment. This would create a change for the better and help change the offender into becoming

ing a better person. A few quotes from the volunteers show what they meant about change. These two quotes were from a middle aged Hispanic male:

“He was not the same kid who came over crossing his arms [who] thought [he] knew everything”

“This person is really getting it. They appreciate the chance and they change and that is truly amazing. This is a change we need in this society.”

These quotes are from a white female adult who believes restorative justice brings change and a stronger community:

“It is really giving young people an opportunity to learn and grow and become the people they want to be rather than being stuck in patterns.”

“Turning around and showing that’s not who I am. I can be someone else and I [have] been given a chance to learn from my mistake and become a stronger person that we can use in our community.”

Another volunteer who comments on change and the justice system said:

“Especially in the change I have seen happening in the offender so called that they have changed for the better and so they haven’t been sentenced and punished and been caught inside of a system.”

In summary, volunteers feel that the current situation is unjust toward minorities, it is important for youth to be accountable and responsible, they are stewards of community in varied ways, and they as volunteers are creating change in society by supporting restorative interventions. Survey data provide additional support for many of these findings and also further describe the volunteers and their similarity to past studies about them.

Survey Responses. Although questions were not asked in the online survey dealing directly with the theme that *system is unjust*, it is probably true that concern about this is a backdrop to volunteer motivations reflected in other themes. The online survey data provide particularly strong support for volunteer perceptions that they are involved in *creating change*. For example, one question asked, “How well do you think victims are treated in restorative justice processes compared to what they would have received through existing juvenile/criminal justice processing? Please evaluate each item below: outcome/results for the victim.” Nineteen of 22 chose either a 4 or 5, with 5 being highest, meaning that restorative intervention was better than the traditional justice system. Through all the survey responses, we found that the volunteers thought the victim was being treated much better through restorative processes than when they were in the regular justice system, which was

Restorative Justice

all true as well during the interviews of the volunteers. Likewise, when asked if restorative justice for juveniles should only be used for less serious offenses, over 68 percent disagreed or strongly disagreed, which shows the support of restorative practices with more serious crimes. When asked if restorative justice should be a referral alternative for all youth, about eighty-six percent agreed or strongly agreed.

The survey data also relate to the creating change theme in another question that asked, "...we want to know how satisfied you are with volunteering," including an item asking them to respond to the statement, "I have been able to spend time making changes in the community." The response options are 1-strongly disagree to 5- strongly agree. The mean response is 3.91. Another statement is, "I have been able to spend time making changes among youth," which has a mean of 4.14. These results show that the volunteers are able to see changes in the community and changes among the youth and that they have contributed to such changes.

There is also substantial support in the survey data for the volunteer perception that they support offenders being accountable for their actions. One question offering a yes-no response asked, "How if at all has your experience.... allowed young people to be helped." All the volunteers chose "making them feel accountable for what they did." All but two of the 22 volunteers agreed with the statement that in their experience the restorative process was "making them feel responsible for what they did." This shows that the volunteers are able to witness offenders being accountable and taking responsibility for their actions. From their perspective this is necessary for the restorative justice system to be successful.

The survey data also strongly supported the theme of *community* in varied ways. For example, one question asks, "How well do you think victims are treated... Compared to what they would have received through juvenile/criminal justice processing?" The response option for this item is either a "1" means traditional treatment is better and "5" means a restorative intervention is better. The mean response is 4.43, strongly favoring restorative intervention. Using the same response option as immediately above, another question asked about their "concern/outcome for the community." In this question there is a 4.43 mean favoring restorative intervention. The results here show how the volunteers prefer the outcome for both the victim and the community after restorative intervention compared to the traditional treatment. Another question asks, "How well do you think victims/impacted parties are being served/helped?" and specifically "that the needs or problems in their local community are addressed?" This response option ranges from 1 (not at all) to 7 (a great deal) and the results are a mean of 5.23. These findings show that volunteers perceive that the community's needs are being met.

Survey data are also helpful in showing how similar the volunteers studied are to volunteers who have been studied in past research. For example, all of the volunteers had some or a lot of college education, which was consistent in the prior research (Karp, 2004). A high proportion are professionals (fifty-five percent) and forty-three percent of the volunteers are retired. In the interviews the retired volunteers thought it was a great way to spend the free time they had, which kept them

busy being productive in the community. None of the survey respondents chose Republican Party but seventy-seven percent chose Democrat. The survey respondents are fifty-two percent male and forty-eight percent female and forty-three percent have been volunteering for three or more years. This shows how many people stick with the program and the satisfaction of being committed. These findings are not dissimilar to prior studies.

Many of the volunteers had prior volunteer experience especially with juveniles (eighty-two percent), adults (seventy-eight percent), and prisoners (forty-three percent). The broad experience with volunteering is consistent with prior studies and with the interviews, as many volunteers talked about their careers working with children as teachers or in other professions.

Survey data also provided other information. Sixty percent of the volunteers are married but only thirty percent had children, and in the interviews a few said that is why they volunteer with children because they had none of their own. The families of the volunteers were very supportive of them: eighty-two percent indicated the strongest level of support. The volunteers in general were satisfied with their volunteering and its relation to the community--fully seventy-eight percent agreed or strongly agreed with this item--similar to the results in Karp et al. (2004). The extent of volunteer commitment to restorative solutions to problems is revealed by their answers to questions about what they would do (i.e., use a restorative intervention or traditional criminal justice processing) if they were a victim of a crime that involved vandalism of the home or the car (all said they would want restorative justice) but for sexual assault only forty-seven percent would want restorative justice. For murder of a loved one fully fifty-six percent would want it.

Demographic information indicates that most volunteers are white (eighty-seven percent), married (fifty-nine percent). Most believe they are spiritual people but most are not affiliated with mainstream religions. Most (seventy-six percent) are democratic in political party choice, with males at ninety percent and females sixty-three percent. The majority, similar to prior research by Souza and Dhami (2009), had at least a bachelor's degree (seventy-three percent).

Conclusions

I conclude from this research that the volunteers share many motivations. One of the major ones is that they want to give back to the community. All of the volunteers also believed that it's best for our society to not simply punish young people, but bring them back into the community after they have participated in the restorative justice process.

The movement for restorative justice is making significant changes in our justice system, which has benefits for the youth involved and the volunteers who give their time. The volunteers believe those who go through this program are being held to be responsible and accountable and are able to change for the better. They believe the process and the outcome benefit the community, victim, and of-

Restorative Justice

fender much better than the existing justice system.

As shown in prior studies, and replicated here, volunteers are not as multicultural as the population they serve but represent the “white middle class” while the youth they process are primarily Latino and economically disadvantaged. One implication of the research may be to encourage restorative justice programs to recruit more diverse volunteers. While this is a common pattern among people who volunteer to help persons caught up in the justice system, it highlights why the need for training is paramount. Although the volunteers in this study felt that they were adequately trained for their roles in restorative justice this is an area that may require constant attention. On the optimistic side of this is the advantage of having volunteers as such, noted by Karp et al. in the literature review: volunteers may bring a democratizing process to the table and engender sustained community involvement in decision-making.

Future research could look at other dimensions of volunteer work, perhaps by conducting process analysis of volunteer participation in the various councils that support restorative conferences. It could also examine volunteer beliefs about perceptions of whether the existing system for processing offenders is unjust. Another important question is specification of the influence that volunteers may have on the disposition process, offender recidivism, as well as the satisfaction of victims, impacted parties, offenders and others. Finally, the significance of volunteers as a force in creating change in local communities has yet to be studied.

Appendix

Exhibit A

Interview questions

How did you get involved volunteering at restorative resources?

What other volunteering do you do?

How often, how long have you volunteered?

How were you selected to be a part of RR?

What type of training do you get?

How do you feel Restorative justice is helping the community?

How do you think the victims are being treated in this process?

What kind of impact does this have on the offender?

Would you prefer this type of justice if you were the victim of a crime?

What are your goals here at restorative justice?

What do you think should be changed in our current justice system evolving juvenile?

What do people in your life, such as your family, and friends think about you volunteering here?

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Restorative Justice

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Minimizing Experiment Mortality in Kinesiological Research: An Examination of Research Participants' Experiences

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Abstract

The effect of test subject mortality in longitudinal kinesiological studies impacts research outcomes. Test subject mortality (or when subjects leave the research study) threatens internal validity which compromises confidence in causal relationship between the two variables of a study. This study examines the effects of subject mortality to a kinesiological research study as well as determines ways to minimize test subject mortality in undergraduate kinesiological research. Ten human subjects (five from the control group and five from the experimental group), participants in the kinesiological research study, "The Impact of Backward Walking on Hamstring Flexibility," were interviewed regarding their experiences as test subjects. The researcher transcribed each interview to develop codes which were then used to generate themes. In the future, by providing the proper combination of extrinsic and intrinsic motivation to the research participant(s), there is a likely chance that the researcher can retain subjects' participation in a study. Similarly, by removing unwanted pressures perpetuated by the setting of the research, test subject mortality may be reduced.

Keywords: test subject mortality, attrition, intrinsic motivation, extrinsic motivation

Introduction

Studies in kinesiology are accomplished by using human test subjects. Often, these studies can be long and tedious, requiring a significant time commitment from those participating in the research. The loss of test subjects – whether in a quantitative or qualitative study – potentially impacts the research findings. In quantitative research, the researcher raises a particular question and gathers a sample of statistical data from observable experience or from study participants to answer the question. With qualitative research, the researcher intends to collect an in-depth understanding of human behavior and the rationales that govern those behaviors. In any case, according to Professor Michael from Indiana University (2014), losing a test subject due to internal or external factors such as death, loss of desire to continue, loss of availability, geographical move, being negatively impacted by the treatment, etc. have the potential to hinder the progress of that research.

Kinesiological Research

This study examines subject mortality in kinesiological research as well as determines ways to minimize test subject mortality (in particular) on undergraduate kinesiological research. In fall 2014, the researcher conducted an experiment called “The Impact of Backward Walking on Hamstring Flexibility.” There were thirty test subjects in this research study: fifteen backward walkers and a control group of fifteen forward walkers. Subjects in both groups walked for fifteen minutes twice a week for ten weeks in a controlled environment. After completing the 10-week backward walking regimen, the test subjects showed varying increases in hamstring flexibility. Upon completion of this experiment, the researcher became fascinated with test subject mortality in research and how it can be minimized in kinesiological research. The backward walking research had zero test subject mortality and because of this, the researcher was able to analyze the backward walking research appropriately with no threats on the external or internal validity of the research. The backward walking research participants served as the primary subjects for this current research.

Literature Review

Test subject mortality has been identified as a serious problem in longitudinal studies in multiple genres of research. Numerous research studies have been done that test how subject mortality relates to internal and external validity. For instance, Biglan et al. (1985), studied prevention of cigarette smoking in children. They found that recent studies have suggested that a prevention program that addresses the social influences that encourage smoking can be effective in deterring cigarette use by adolescents. The results of their study suggested that a peer-led, social influences program can restrain smoking among both baseline nonsmokers and baseline experimental smokers at two years post intervention. In addition to examining the efficacy of programs to prevent smoking, the researchers analyzed test subject mortality in regard to their data and analysis. They proposed that there was no evidence to threaten the internal validity of their findings, although their generalizability to baseline smokers may be limited.

Moreover, test subject mortality is significantly high in research that deals with critically ill test subjects. According to Longabaugh et al. (2001) and Woolard et al. (2004), the struggle to locate patients for follow-up is one of the major difficulty facing researchers conducting longitudinal research with Emergency Department (ED) patients. Follow-up rates from ED studies of patients with substance misuse vary greatly from study to study with attrition rates ranging from less than 10% to more than 50% (Ribsil et al. 1996). In addition, Ribsil et al. (1996) stated that while some attrition is inevitable in longitudinal follow-up studies, understanding individual and contextual characteristics that predict contact difficulty (defined as either the amount of time or the number of attempts required to locate a participant and complete a follow-up assessment) has tremendous utility for planning longitudinal studies. Ribsil et al. (1996) concluded that differential loss of test subjects could be a detriment in a study

because participants who successfully complete all follow-up measurements often differ in significant ways from those respondents lost to attrition. Test subject mortality not only impacts the legitimacy of experimental comparisons and may correspondingly limit the validity of kinesiological research findings.

Methods

After obtaining Institutional Review Board (IRB) approval from the Office of Research and Sponsored Activities, the principal researcher recruited ten human subjects from his previous kinesiological study, “The Impact of Backward Walking on Hamstring Flexibility,” via email and in-person communication. All subjects completed a consent form prior to participating in the study. No information was withheld from the participants. All aspects of participant’s involvement were explained to them by the principal investigator. Because the researcher sought to collect rich, “thick” data, qualitative methods, specifically in-person semi-structured interviews, were employed. Consequently, the investigator did not require randomization or blinding of the participants. The interviews took place in a physically safe environment located inside the library of Sonoma State University. Ten human subjects (five from the control group and five from the experimental group) took part in one-on-one interviews regarding their experiences as test subjects on backward walking research. The researcher recorded each interview using a phone application called “*Voice memo.*” The researcher transcribed each interview to identify codes for the later development of themes.

Subjects were asked the following questions:

1. Do you know the definition of test subject mortality? If so, what do you think it means and why it’s important in research?
2. What made you participate in the backward walking research?
3. Other than the backward walking research, did you participate in another research? If so what?
4. Were there times when you wish you did not participate on this research? Why or why not?
5. Did you believe in the academic merit of the research? If yes, what did you think it added to the field of kinesiology?
6. Were you part of the control or the treatment in this research?
7. Did you like the group (control or treatment) that you ended up being

Kinesiological Research

part of? If so why? In what ways did being in the control or treatment group effect how you viewed your participation or role in the study?

8. What is difficult/easy to retain your participation in this study? Why or why not?
9. Did you have any concerns during your participation?
10. Was it hard for you to balance being a test subject on a research and a being a student? Why or why not?
11. After the research was completed, did you continue with the treatment?
12. Did you recommend and or talked about the academic merit of the research to other people?
13. How much did the monetary compensation motivate you to attend the time allocated for the research? If not money, what motivated you to go?

Selected Interview Questions that produce themes regarding test subject mortality:

1. Do you know the definition of test subject mortality? If so, what do you think it means and why it's important in a research?
2. What made you participate in the backward walking research?
3. Did you believe in the academic merit of the research? If yes, what did you think it added to the field of kinesiology?
4. Was it hard for you to balance being a test subject on a research and a being a student? Why or why not?
5. How much did the monetary compensation motivate you to attend the time allocated for the research? If not money, what motivated you to go?

Results

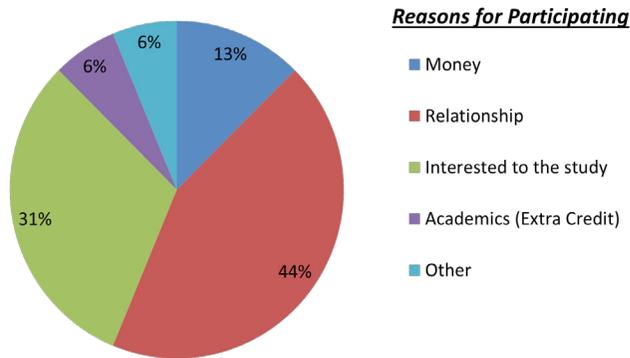


Figure 1 was derived from the responses to the question “What made you participate in the backward walking research?” This figure shows that about 44% of the participants stated that the relationship they had with the researcher was one of the reasons why they participated to the backward walking research. One participant said, “I participated because you sold it very well; I wanted to participate in it and I wanted to help you out.” About 31% of the participants said that they participated because of their interest in the academic merit of the study. One participant specifically noted, “I’m really interested in research and participating in this study made me motivated to be part of other research.” About 13% of the participants stated that the money (\$30 per person) they would get after completing the research was one if not the sole reason why they participated in the research. About 6% of the test subjects stated that receiving extra credit in one of their classes was the reason of their participation. Finally, 6% said that the reason of their participation were because of a potential romance with another participant.

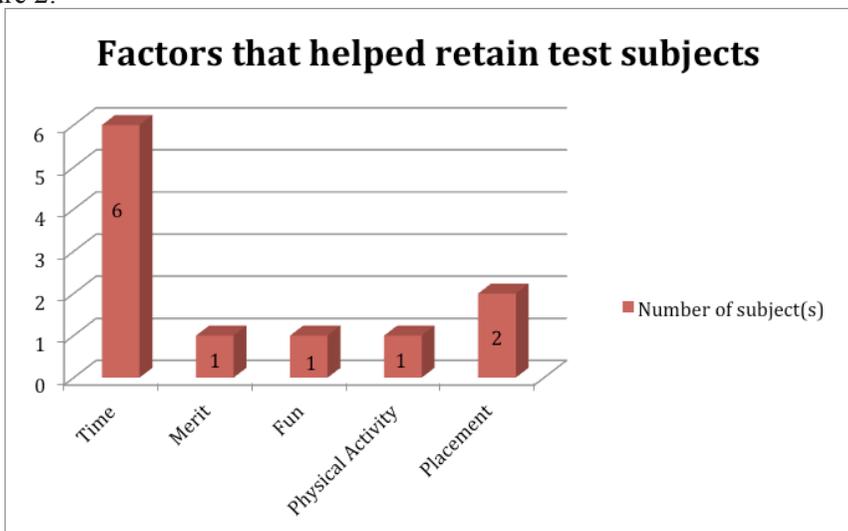
Table 1. Qualitative responses regarding extrinsic motivation

<i>Extrinsic Motivation</i>	Quotes
Money	-I was given an incentive of the promised money. - To top it off the researchers said that you would be paid 30 bucks so why not so that was another thing that encouraged me.
Academics - Grades	- The first thing that encouraged me is that our professor was talking about it and that we would receive an extra credit for it
Admiration for other	- Well there were a lot of things. I was kind of getting to know somebody at that time and they were also participating

Table 2. Qualitative responses regarding intrinsic motivation

<i>Intrinsic Motivation</i>	Quotes
Relationship with researcher	<ul style="list-style-type: none"> - I thought that helping you would be a great opportunity because I find you to be a nice person so I thought I'd do it. - I was approached by you because you were looking for subjects - I knew the person conducting the research and I thought it'll be interesting to participate in something that haven't been gotten any previous data before - Because you sold it very well, I wanted to participate in it and I wanted to help you out - I was approached by you
Interest in the merit of the study	<ul style="list-style-type: none"> - It sounded like an interesting study to be part of - Well I'm really interested in research - I'm really fascinated with the research question and process. Also, I've never been a participant - I thought it was a cool research - It sounded cool and I was actually interested in the results like what would happen

Figure 2:



This figure was derived from the responses of the participants to the question: “Was it difficult/easy to retain your participation in this study? Why or why not?” Responses showed that the time of the research was the primary factor that led the participants’ retention in the research. The backward walking research participants walked for fifteen minutes twice a week for ten weeks in a controlled environment. One participant said, “I felt like it became a routine. It became a part of my week where I knew Monday Wednesday were the days that I would wake up and go.” Two participants commented that being placed on the experimental group rather than the control group retained their participation to the study, noting that if they were placed in the control group that they may not have stayed to the end of the research project. One particular participant stated, “. . .because I’m in the treatment group I felt more obligated to be honest and come and not miss a day. I feel like if I were in the control group I would not try as much harder. I feel like if I were in the control I wouldn’t affect the data as much because we walk every day.” One person stated that the curiosity of the potential academic merit of the research to the department kinesiology was the reason for their continued participation in the study. One person stated that because the ambiance of the experiment was fun, this retained them to the research. Similarly, another found enjoyment in the backward walking research being a physical moving activity.

Discussion

This study essentially examined the research participants’ experiences. The results suggest that both types of motivation had huge effects on the subject mortality rate for the research study. The backward walking research had zero test subject mortality. The results suggest that if a researcher can provide the proper combination of extrinsic and intrinsic motivation to the research participant(s), there is a highly likely chance that the researcher can retain subjects’ participation in a study. Extrinsic motivation refers to behavior that is driven by external rewards such as money, fame, grades, and praise. This type of motivation is great for straightforward and non-lateral thinking tasks. Intrinsic motivation, on the other hand, refers to behavior that is driven by internal rewards such as the subjects’ interest in the study and the relationship they had with the researcher. In other words, the motivation to engage in a behavior arises from within the individual because it is intrinsically rewarding.

Moreover, the findings of this research suggest that the research setting may contribute unwanted pressure to the test subject. The environments in which kinesiological test subjects perform the experimental treatment have the potential to continue or discontinue the positive performance of the research participants. This effectively means social agents such the researcher and other people in the research have a direct effect on the environment of the research and participation of the test subjects. The environment of the research can actively affect that person’s motivation both intrinsically and extrinsically. A study by Duda et al. (1992) assessed the degree to which intrinsic, motivational and at-

Kinesiological Research

tribution beliefs are a result of perception of the motivational climate. The results of the study best indicated the individual's goal orientation. Duda et al, (1992) found that a task orientation predicted the belief that effort causes success and that the motivational climate of the environment had an effect on the performances of the research subjects. The findings of this research yield the suggestion that future kinesiological research may prevent test subject mortality by removing unwanted pressures perpetuated by the setting of the research.

Conclusion

This study indicates that motivation of the human test subjects in a kinesiological research plays a critical role in the prevention of test subject mortality. Proposed methods to retain test subjects in a kinesiological research include providing appropriate arrangement of extrinsic and intrinsic motivation to the research participants and removing unwanted pressures perpetuated by the physical setting for the research. Further research is required to test the likelihood of test subject retention due to the participant's interest on the potential merit of the research. Additional research is needed to assess how research subjects'/participants' knowledge about research biases impact their retention and by extension, the preservation of internal and external validity of a research. These findings may provide constructive and useful information to reduce attrition rates in other longitudinal research.

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Navigating And Framing The Education And Identity Of Children With an Autism Spectrum Disorder (ASD) Within The Structure Of Public Schools: Parents As Caretakers, Interpreters And Advocates

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Abstract

Using in-depth interviews with parents from different social class backgrounds, I describe the different ways parents advocate for their Autism Spectrum child's education within the structure of the public school system. The purpose of this research project is to explicate how the experience of the ASD diagnosis for the child and for their parent(s) is shaped by particular institutional arrangements and requirements as well as the cultural capital and economic resources of the parents. 10 in-depth interviews were conducted in the San Francisco Bay Area. The data reveals several themes: Institutional Interactions: Problematized Behavior That Turns A Parent Into Educational Advocate; Education Of ASD Students And Body Management In Schools; and Class Placement Is Everything. The data reveals that interactions with social institutions could act as an impetus for assessments and diagnoses for the child with ASD, which is also a pivotal point for transforming a parent into an ASD child's advocate. In addition, the data reveals that the success or lack of success in managing an ASD child's embodied symptoms is a key factor in determining the ASD child's education and identity.

Introduction

A review of the supporting literature reveals that the prevalence of autism spectrum disorders is on a dramatic rise and breaches barriers of race and class. While autism diagnoses have been on the rise, Baio (2014) acknowledges that the increase in prevalence could partially be due to increased awareness and shifts in assessing and diagnosing the disorder yet still notes an alarming 78% increase between 2006 and 2008, with the bulk of the increase occurring between Hispanic and African American children. The current prevalence rate is 1 in every 68 kids and has the potential to present significant consequences for ASD diagnosed children, their families and schools.

The high rates of children with ASD means that these kids are likely to have a significant presence in the public school setting. Between 1990-1991, only 4.8% of ASD children were integrated into a general education setting for 80% or more of their school day compared to 29.1% of ASD children in a general education setting for 80% or more of their school day between 2003-2004 (Whitby, Schaefer,

Travers, and Harnik, 2009). Whitby, et al. points out that: “The general education service placement of students with ASD increased at a faster rate than all other disability categories combined” (p. 3).

Current legislation

The current protective legislation affording ASD children rights to certain equalities is known as IDEA (Individuals with Disabilities Education Act). IDEA evolved out of EAHCA (1975), which stands for Education for All Handicapped Children Act (Etscheidt 2012). EAHCA afforded rights to students such as “zero reject, unbiased classification, a free appropriate public education (FAPE), the least restrictive environment (LRE), procedural due process, and parent participation” (Etscheidt, 2012, p. 181). However, this earlier version of EAHCA did not include those students with Autism. In 1990, EAHCA was changed to IDEA after it was amended to include those students with brain injuries as well as autism (Etscheidt, 2012). Further, IDEA grew to mandate general education teachers to modify their teaching strategies in order to accommodate ASD kids (Moores-Abdool, 2010) and also grew to include the requirement for “high quality teachers” so that effective implementation of modifications would satisfy IDEA requirements. (Morrier, Hess, and Heflin, 2010, p. 119).

Parents and Caretakers as Educational Advocates

The implementation of ASD modifications in a general education setting leaves the families and caretakers of ASD students with the responsibility of monitoring and managing said modifications and ensuring the continuity of modifications. This shapes the identities of these families and caretakers into the role of educational advocate. The type of capital needed in order to ensure effective advocacy will be very specific. The efficacy of advocacy requires parents and caretakers to have time and time management, knowledge, communication skills and appropriate behavior management (Foster, Rude, and Grannan, 2012). Since this specific skill set represents capital that will not be imbibed among individuals of all types of social classes (Lareau, 2011), there will be unintended consequences and an inequity in access to services for those families who belong to a lower socioeconomic status. Litt’s (2014) research discovered that direct advocacy carework puts a significant strain on the employment of low-income women, which is often times inflexible. In addition to inflexible employment, other barriers that can make advocacy work heightened for low income families may include, but are not limited to: low wage employment, rigid work requirements mandated by welfare, unstable transportation, inadequate medical insurance and inability to access supplemental services for the ASD child.

Even in a Western world, the way children's place in society is viewed makes them a marginalized group. Children are often times looked down upon and seen as lacking autonomy, threats in adult spaces, targeted victims, and little adults in the making. Children are often times left out of decision-making processes and viewed as incapable of holding valuable opinions (Thorne, 1986). Seeing children in such a way will also make the bodies of children highly regulated, policed and controlled. In Mayall's (2008) work on the lived bodies of non-disabled children in everyday life, the pervasiveness of the regulation over a child's body is illuminated. While there are no spaces in a child's life that do not include the need for body management, including the child's home, the most heavily regulated spaces appear to be in an educational setting as well as other public spaces. Now, factor in the presence of a disability, and the body management of children is taken to an ever-heightened state. A prominent theme within existing literature is the idea that disability can determine to what extent one's body is controlled. Disabled bodies in general are viewed as being unable to manage on their own. Hence, power and control of one's own body is decreased as privilege is given to those with bodies that are not disabled. This appears to be a binary structure that consists of either abled or disabled and does not leave any room for the idea that the ability of bodies can exist on a continuum (Mitchell and Snyder, 1997; Wendell, 1996; Titchkosky, 2000).

In Kwan's (2010) article, there is the discussion of non-normative bodies and the consequences when a non-normative body enters a public space. Bodies become highly policed when entering public spaces so as to assure that bodies remain within this binary system. Kwan uses terms such as "body oppression" and "body privilege" which should be applied as macro terms, whether applied to feminism or disability studies. For example, when a child with autism enters into a general education setting and embodies a non-normative behavior, such as stimming, which is a common behavior in children with an ASD, there will need to be either an explanation provided to the child's peers and perhaps even significant surveillance by adults to ensure this child is not socially sanctioned by their peers. Further, many parents could feel compelled, often times at the advice of a medical or educational professional, to seek out expensive behavioral interventions for the child that stims. Or perhaps, the child with an ASD has a co-occurring attention deficit diagnoses (ADD) and cannot sit still or focus for sustained periods of time, which would be required when in an educational setting and in many other public settings. An attention deficit diagnoses will then act as an impetus for extensive body management over the child.

Disability and Identity: A Signifier of Worth

There can be different types of human capital one can accrue. For example, consider independence, motivation, language and communication skills, and

then apply the ability to tie all of these characteristics together into one useful, productive package. However, as the Edwards and Imrie (2003) literature reveals, current social ideologies support the contention that disabled individuals, children or adults, lack economic and human capital, deeming them worthless, unable to take care of themselves or others or even lack the cognitive capacity to be able to learn new things or develop their own coping mechanisms. Further, it isn't just society that deems disabled individuals as less than compared to everyone else, but the individuals themselves are now likely to develop and maintain identities that are predicated on how everyone else sees them. Goffman (1973) argues that individuals will make sense of identities, both their own and others, through specific interactions with others. In fact, Goffman argues that one's own personal identity and the identity of others are not mutually exclusive but, rather, interdependent. While some are able to manipulate these interactions to present an identity reflective of dominant cultural ideals, what of the child with autism who cannot maintain consistent eye contact? What about the child with autism who has significant deficits with auditory processing, who can only use scripts from movies or song lyrics to communicate or who might have delays with expressive or receptive language as many children with autism do? Or what about the child with autism who is non-verbal and can only point while making muffled noises? No matter how an individual attempts to present themselves to others, the second there is any deviance from the proper script, the individual's performance will quickly be discredited along with a forfeiture of any power the individual may have held. (Goffman, 1973). Adding to this concept Goodley and Cole (2014) state "Disabled people often feel unwelcome in mainstream spaces and are forced to struggle with a sense of belonging. This can have huge impacts on one's sense of self" (p. 53).

Methods

Recruitment

The recruitment process was significantly more difficult than initially expected. As an autism parent, there was a preconceived notion that gaining access to this group of people would pose minimal challenges. When in fact, it was the most challenging aspect of the study. A research advertisement was drafted and revised several times and was distributed to numerous local agencies and ASD support groups as well as national ASD advocacy platforms. Very little response came out of the research ad, even after revisions. The first 5 participants were recruited through gatekeepers. After the first 5 participants were interviewed, I started to network. I spent approximately 4 weeks attending workshops and trainings for parents of children on the autism spectrum. Almost every time I attended a workshop I met a parent who was willing to participate in the research. As I attended more workshops I started to network with the autism community, and I was invited to attend a private support group both that met online and in person.

Autism Spectrum Disorder

I found the networking to be the most effective form of recruitment.

Interviews

8 of the interviews were conducted in-person, 1 interview was conducted via Skype and 1 interview was conducted over the telephone. All of the interviews were in-depth. The interviews ranged from 1½ hours - 2 ½ hours. The interviews began with review of the informed consent, obtaining signatures and pseudonyms for the participants and their children. For the interviews conducted on the phone and via skype, I emailed the informed consent to the participants and requested they read over the form, choose a pseudonym and replay back via email with the statement, "I have read the informed consent and agree to its terms." The interview guide was amended after each interview.

Sample

The sample consists of 10 mothers with children who have an autism spectrum diagnoses. The children are either currently in a general education setting or a special day class in a public school district or had previously been in a general education setting in a public school district, and who currently have an Individual Education Plan (IEP). 9 participants identify themselves as Caucasian and 1 identifies as African American ranging in age from 30-63 years old. The family incomes range is the most diverse aspect of this sample ranging from \$30,000 - \$350,000 per year. Participants' educational backgrounds range from a high school diploma with some college to a Ph.D. co-occurring with dual master's degrees and multiple certificates. 7 of the participants are from Sonoma County, 2 from Marin county and 1 participant is from a suburb of Indiana.

Limitations

While my personal experience as a mother with two children on the autism spectrum has positioned me in a particularly useful stance from which to conduct the research, the research was no doubt affected by my subjective experience. A concerted effort was made to be as objective as possible when drafting the interview guide, conducting interviews and analyzing the data. Further limitations include sample size. The sample size is quite small and limited to one geographical area and therefore cannot be generalized. In addition, the sample is limited by race/ethnicity.

Results

Institutional Interactions: Problematized Behavior That Turns A Parent Into Educational Advocate

Children on a Fast Track to Diagnoses

While all participants had previously developed suspicions or knowledge that their child would require a specific type of care or would have developmental delays and deficits before attending school, many parents experience their child's circumstances much differently and at a substantially more heightened state when it came time for the child to sustain interaction with a social institution, specifically a school. Once the participant places their child into an educational setting the differences in these children become quite visible and the experience puts the children on a fast track to additional assessments and also transform the role of the parent into an advocate as they ultimately seek to attain a diagnosis or medical explanation for their child's behavior. 41-year old April Jameson has two boys on the spectrum. Her eldest son, Joseph, is in the middle of the spectrum and is 18 years old now, getting ready to graduate from high school and attend college. Joseph was identified ASD earlier in his development, and April has been advocating for him his whole life. Prior to Joseph's diagnoses, April describes her experience when Joseph was first placed in an educational setting:

But then, you know, and as the school year rolled on, um, there seemed to be some issues so by the time we got to conference period in November around Thanksgiving, that's when we started, that's when we got called in, there's a problem, he doesn't seem to recognize danger. You know, he walked right in front of a tire swing, like with no, not flinching at all, with no awareness whatsoever. He seemed to come, at the time he didn't even, like they had a fire drill and he didn't even seem to notice, and he was right under the bell..... And I volunteered in the class. It was a co-op so I had to volunteer in the class. Um, I noticed some big differences between him and the other kids. It was like, gosh, you know I don't know much about preschool, I know kindergarten through 6th grade but this is weird..... So, long story short, the school kind of pushed us to get him evaluated.....

Up to this point in Joseph's development, April had suspicions that Joseph may not be a typically developing child. However, once Joseph was required to function in an educational environment and was compared to other children, the experience acted as an impetus for further in-depth evaluations and a validation that Joseph was not typically developing.

Similarly, when 55-year old Anne was interviewed about her son Michael, who is now 18 years old, and their diagnostic process, she describes an encounter that also paved the way for additional assessments:

I actually had put him in Catholic pre-school when he was 3 and, um, at the end of the Catholic preschool she recommended we hold him back a year, in other words, do 3 year old preschool

Autism Spectrum Disorder

twice. So, we knew something was up there, and then, um, I had him tested at a preschool screening at a public school. And, he qualified for special services at that time

Once Michael's pre-school teacher recommended retention for Michael, the presence of Michael's non-normative behavior shifted into a heightened state of reality for Anne and was validated when Michael qualified for special services.

51-year old Olivia experienced the same situation as she describes a pre-school encounter the influence Ashton's school had on the possibility of an ASD, who is now 12:

And then he would go for circle time, and he would run in circles, run in circles, run around, they had a round rug, and he would run in circles, run in circles, run in circles and he couldn't follow the instructions of the teacher at all. And the director was like what's going on with A and I said I don't know..... So then, he went to Montessori for a while and it was, you know, he just wasn't up to par with the other kids that were there and they were all the same age. And they just seemed so far advanced compared to him. And he would go out in the yard and play in the sandbox, they had a little sandbox that was kind of high, and they had little trucks. And he was always obsessed with wheels, trucks, moving parts. And he would sit for a very long time and do this (motions as if spinning a wheel) watch the wheels go back and forth. And my, my husband at one time, he said, long before he went to Montessori or anything, he said do you think he has autism..... So we took him to Dr. R and she is the one that, oh no, I think I took him to the SC first, they tested him....

As Olivia describes, Ashton's father suggested the presence of autism prior to Ashton's pre-school experience. However, it wasn't until the pre-school experience that Ashton had an evaluation.

The Education and Advocacy of an ASD Parent

While the sample size here is small, the educational backgrounds and income of the participants are diverse. While many of the participants interviewed have been advocating for their ASD children for many years, many of the mothers did not start off with advocacy skills that were effective in navigating their child's education. Rather, their advocacy skills have evolved and are continuing to evolve. The data presents a potential correlation between education and efficacy of advocacy. Even where household income is above average but educational background is minimal, the advocacy practices of these mothers are not as efficient and effective compared to those mothers who have achieved a higher education. The mothers who start off functioning at a lower advocacy level are more likely to accept recommendations not just from the school, but from the child's medical

team as well, without any push back or further questioning. Looking at the case of Jessica and her 10 year old ASD daughter Cece, when she was discussing some of her first experiences attempting to retain school-related services this is an example of a typical encounter at the infancy of her advocacy:

there was a lot of resources that we had for kids with Autism, um, but navigating that and trying to get ABA or trying to get a, um, an aid in the classroom with her was just a struggle. It was just insane. We couldn't end up getting it because they said, "oh we have someone who comes in that can kind of help her." And me being naïve thought like oh well if that the best you can do that's fine.

As Jessica explains, there was a passive acceptance of the school's response to the request for additional therapies and modifications.

Using Jessica's advocacy as a comparison, Mary is a parent who has dual master's degrees and multiple certificates, and although advocacy was still a cumbersome job, she was worked 60 hours per week and also taught fitness classes on the weekends and her advocacy skills were much more advanced:

P: So I've actually done extensive training at their schools, teaching their teachers how to use writing programs, teaching them how to develop visual schedules, I volunteer in the classroom, I support the resource specialist, I mean I've done extensive supporting and training to get them to have a better skill set.....They did hire this supposed autism specialist who was supposed to come and help these children integrate throughout the district but his skill set was so poor he didn't even know how to make a visual schedule. So I had to create visual schedules and show him how to do it and explain to him how to tie behavior to this schedule. And, uh, you know, it was, it's been, I've done an extensive amount. Much more than any other parent I've ever seen in terms of education.

I: So you obviously at no point have had to get a.....

P: A lawyer?

I: Or an advocate or anything like that?

P: No. They don't mess with me. There's been several incidences that have occurred where they know that I could sue.

When Mary discusses the extent to which she is involved with her son's school, and considering her busy weekly schedule, it is very clear that her advocacy skills are advanced. Mary has the knowledge of which modifications to implement, how to implement them, how to keep the IEP team from reaching an escalated state of

Autism Spectrum Disorder

interaction and how to efficiently manage her weekly responsibilities.

Another factor identified as having a potential correlation to education and effective advocacy is whether or not parents accepted their child's ASD diagnosis. It appears as though the parents who had more education were more likely to accept their child's ASD diagnosis and be able to secure service earlier for their children. Tiffany explains her reaction to her son Jordan's diagnosis:

Well when they said this is the C clinic and this is what they test for, we were like oh, oh my gosh, you know, kind of what that would mean if he did test for it. I think, like I said, I think after the diagnoses, for a good year, I was just like, I don't even know what to do with it. Like, I really don't. Like, I don't know what does this mean. Like, I didn't, I don't, and I feel dumb now, you know, years later, how could you be so frozen.

What Tiffany is describing seemed to be a common pattern for those parents who did not attain a higher education.

At the time I interviewed Jessica, she seemed more accepting of the ASD diagnosis than she had admitted to being previously. However, when deciding how to best advocate for her ASD daughter, the subject of what that would really mean in terms of accepting her daughter's ASD diagnosis came out as a factor:

So, I had a meeting with the teacher and she just informed me that my child was out of control and didn't know how to listen and cried all the time and, a lot of me wanted to pull her out of that classroom. But, at that time I was still in the mode of she doesn't have autism. Because of that label, a lot of me was like no, no. She already has other labels, I don't, you know I was like, people's perception of autism is, actually drives me crazy, and I thought no, no, no. She doesn't have that. And the teacher was basically like she's a bad kid. And she would do cartwheels in line at recess. Just that kind of stuff that didn't make sense to her but made sense to me. We didn't end up pulling her out because, I thought ok, if it's not autism she needs to learn how to deal with teachers that aren't, you know a normal thing, which actually ended up being a huge mistake and I really wish I would have.

The data here seems to paint a portrait with education as the backdrop. The more education a parent has the more likely they are to perform as high functioning advocates. While all participants were all loving, caring and engaged parents there were stark differences in advocacy skills that appear to be predicated on educational attainment.

Education Of ASD Students And Body Management In Schools. While some symptoms of an ASD can remain invisible, there are many ways in which an ASD is embodied and can create unbounded state. Quite common among ASD

individuals is the occurrence of stimming. The Diagnostic and Statistical Manual of Mental Disorders defines stimming as “stereotyped repetitive motor mannerisms.” Stimming is often times engaged in as a self-soothing behavior, a way to respond to external stimuli or a way to release anxiety. Stimming can manifest in different ways. However, some of the most common forms of stimming among individuals with an ASD manifests as hand flapping, rocking back and forth and a verbal stim such as repetitive language. The hand flapping can be particularly problematic when in a public setting as it is very visible and becomes an embodied state. Hand flapping can occur with and without the presence of patterned tippy toe walking and facial distortions. Other areas affected by an ASD that would require the management of one’s body include deficits with fine or gross motor skills, auditory processing deficits, sensory integration deficits as well as attention deficits such as Attention Deficit Disorder or Attention Deficit Hyperactivity Disorder (ADD/ADHD). These are just some of the common deficits under the umbrella of an ASD diagnoses that will require body management. An auditory processing deficit will not allow individuals to access and process language appropriately, affecting communication skills, interfering with short term memory and deeming many external environments acoustically unfavorable and can create an aversion to loud noises or particular types of sounds; a sensory processing deficit does not allow an individual to process and regulate external stimulus appropriately resulting in, what can be viewed as, inappropriate motor and behavioral responses; and ADD/ADHD will not allow an individual to focus or hold attention on one thing for very long to the extent that it will interfere with an individual’s ability to function and manage impulse control.

Again, while many of these symptoms are not an organic problem and may appear to be invisible, once a child enters into a public space or has any interaction with an institution, such as a school setting, these symptoms quickly become identified and very much visible and are perceived as behaviors that need to be managed, if not corrected and eliminated altogether. The data reveals several discourses of management a school can practice: In-class modifications, one-on-one aides and special day class placement and all of these practices have an impact on the ASD student’s education. The discourse practiced by schools appears to be contingent on the type of space an ASD student occupies; general education or special day class. In addition, while in-class modifications, one-on-one aides and special day placement can occur independently, they are not mutually exclusive and can be used in combination with the others, particularly if the least restrictive modifications alone are not successful in body management.

In Class Modifications

There are many types of accommodations that can help ameliorate some of the embodied symptoms that manifest with delays in motor skills, an auditory processing deficit, a sensory processing deficit or ADD/ADHD. Susan, a 45-year old mother of two autistic boys, Stephen and Kai, describes some of the

Autism Spectrum Disorder

modifications implemented in her son Stephen's general education setting and also identifies these modifications as normal general education modifications:

And lots of social cueing options. Like here at SV, all of our teachers use whole body listening, zones of regulation. They're all trained in sort of supporting kids' needs. They sit on balls, they chew gum, we have a squeeze machine. They take naps, they do daily breaks. You know, sort of regular general ed accommodations.... um they gave him a one on one, who ended up being phenomenal and the only reason why we made it through.

Susan mentions several in-class modifications that are available to Stephen and describes how these modifications, including the aid, are used in combination with others.

Special Day Class as a form of Body Management

Since many of the modifications implemented in a general education classroom will get more elaborate in a special day classroom and more elaborate based on the needs of the ASD student, the data reveals that placing an ASD student into a special day classroom was utilized as a form of body management. If after modifications had been implemented without success the next step would be a special education setting. As Corey explains, a 40 year old resource teacher and mother to 10-year old Dominic, once Dominic's behavior escalated as a result of unsuccessful management in general education, he was removed and placed in an entirely different setting:

He was immediately taken out of 2nd grade and put into the SDC just because he was so volatile at the, at the time. You know, he was running from the classroom, they had to evacuate the classroom and he was turning desks and stuff like that. So they put him into the SDC class. And then they tried a bunch of different one-on-ones and they were just going through them.

Dominic's non-normative behavior had reached a state where it was perceived as unmanageable by the school. As a result, Dominic's placement was predicated on how he embodied his ASD.

29-year old Mary McAdams is a mother of 4-year old Eddy who is diagnosed ASD. Due to the extent of Eddy's needs, his current educational placement is in a special day pre-school class with other special needs children in a public school. Here, Mary describes the types of modifications implemented in his classroom:

I: Ok. And then, what kind of things, so we have the aids and we have the PEC and the visual schedules and stuff like that. Um, what kind of, do they have sensory, do they have a sensory corner, um?

P: Um, they have, you know, swings and hammocks in the classroom. They have a lot of like, foam mats, where they set up little climbing areas for them. They do a lot of outside play when it gets nicer, they'll have like days where they ask you to put some random toys or glitter and ice that you freeze and then the kids bring them in and make an ice castle that they have to melt and...

Mary's description of Eddy's classroom environment is a great example of how body management can be heightened and substantially different from a general education classroom environment.

Unintended Consequences of a Special Day Placement

Another reoccurring theme that made itself present when analyzing the data is that there are unintended consequences of a special day class placement. The nature of an autism spectrum disorder is that, like the diagnoses implies, the symptoms exist on a spectrum. And, if you've met one autistic child then you've met one autistic child as not one is exactly like the other. Trying to accommodate these students makes things problematic in a binary education system that faces organizational constraints as one of its core goals is to work with maximum efficiency. While many of these students will reflect low IQ scores on assessments, it is a poor reflection of the academic capacities these students actually possess. Placing a child in a special day setting may seem a good fit at first; the placement offers small class sizes, often times with para-educators or extra aids where the ASD student can receive extra attention. However, this comes with a heavy academic price tag. Most students in a special day class are working on behavioral goals rather than academic goals. Many ASD students who enter into a special day placement will often times lose much of their academic skills they had acquired up to that point. Or, many ASD students who enter into a special day setting from the beginning will not have access to the same academic curriculum as those students placed in a general education setting. Tiffany, a 41-year old mother to 11-year old autistic son Jordan elaborates on this idea. Jordan is diagnosed ASD and since he was identified pre-kindergarten he entered into a special education pre-school setting and that placement went with him up until 8 years old:

P: I think that in my mind, and still probably to this day, the label and being in special education, um, limit, is very limiting. I feel like they're only, they only have access to so much instead of giving them access to all of it and then seeing what, um, what they can absorb.

I: So like educational access, or like academic or behavioral or social, physical?

P: Everything. I think social, I think academic, I think especially being in a special day class for him was extremely limiting versus

Autism Spectrum Disorder

being in, uh, full inclusion. Um, with an aid.

I: Right.

P: So, I look back at the years he was in a special day class and I think oh my gosh he was only giving, like, this box of information, versus, given, you know, a wide array of information, and maybe he wouldn't soak it all in but at least he would've been exposed to it. You know, he didn't even, they didn't even try to teach him how to read, it wasn't even an option. And it was like, well are you kidding me? He's like 7, 8 years old, and it's not even, like, brought up. And it was like, until he went, until we moved to SR and he got, so we moved to SR and then he went to the special day class because that was all we had known, and that happened to be a severely handicapped class. And, obviously that wasn't appropriate because there were kids with severe physical, um, disabilities that wasn't him. So, the only alternative to that was full inclusion with an aid. So, until I saw that world I was like, oh my gosh, he has been short changed for the last, and then I felt like a terrible mother, and like a terrible person and was like how did I not know, how did I not question, why did I not ask more questions, why did I not push harder. Um, because you think that they are, you know, doing their best for your kids, and maybe they think they are too. Maybe that's, I don't know.

Tiffany's statement here describes the tradeoff of being in a special day class. When Tiffany explains that at 7 and 8 years old her son wasn't even offered an opportunity to learn to read, it is an example of what many parents experience, and aren't always aware of, when choosing a special day placement. Tiffany's son Jordan is now 11 years old and in a general education setting and is a fluent reader.

Class Placement Is Everything. Even though I.D.E.A. states that ASD children have the right to be in a general education setting, this idea seems to be contentious among some general education teachers and can create an equally contentious environment for teacher, student and parent. As a full-inclusion specialist for a public school with two special education credentials and a master's degree, April has been on both sides of the field. When April was interviewed she spoke very calmly and with candor about how a general education teacher's perception of mainstreaming ASD children in a general education setting can make or break the child's experience:

Um, but in terms of general ed no. It's still really, really lacking. There's nobody, they hired this autism specialist to try to bridge that gap between general ed teachers and special ed teachers and I don't think they have that position at all anymore. And that was

very short lived and it's sad because it was a real opportunity, um, it was a real opportunity for them to, to learn. Um, but they often, you know they, it's "i didn't go to school for that. That's not what my credential says." That's kind of the attitude. No matter how much training you provide, the attitude is going to get in the way every single time. That's been my experience in P as well. They've been running a full inclusion program for 20 years, nearly 20 years or something like that. There's still attitudes about "having a special ed kid in my class and trying to modify things for him or, you know, trying to include him somehow. It doesn't make sense to me why he's here, I don't think he should be here." It's very disappointing.

What April described was a common theme among most participants who shared this experience at least one school year while their children were in school. She illuminates the idea that even with in-class modifications and additional services, these things alone aren't enough to set the ASD student up for full inclusion and success.

It is most unfortunate when a child is placed in a general education setting that is hostile and not conducive for ASD students to thrive. However, many times parents and children receive a placement that works in favor of the ASD children reiterating that class placement really is everything. Aubrey's quote below is an example of a successful class placement and how the proper placement can impact on the ASD child's education:

Um, then we moved, um, we moved here and he's done second and third grade here in a mainstream school with aides in the classroom and his IEP is a normal IEP that they do through all the schools. And um, he's done fantastic. He's been on the honor roll multiple times. He passed an Indiana state-mandated reading test, that if they don't pass it they don't move on to 4th grade, and he passed with flying colors. I mean he's, he's thriving in that environment and doing fantastic.

Justin's academic success will, no doubt, also affect his identity and self confidence as he moves forward with his education.

Discussion

For families with children on the autism spectrum, having to interact in a social setting, particularly in school, creates stress and anxiety at a heightened state for both the parents and the children. This heightened state of stress and anxiety experienced by parents and children becomes another symptom that will need to be addressed and managed. This stress and anxiety experienced while interacting with social institutions is one that appears to be a result of a structure that is set up to accommodate a binary system of able-bodied versus non-able bodied individuals,

particularly in an educational setting. As an effort to maintain order and efficiency, it is not conducive for an organization to acknowledge fluidity in capabilities or styles of learning. The current structure of a K-12 public educational setting in most places, or more importantly, the geographic areas where the participants of this study live, is set up to accommodate only two groups of children: abled children and disabled children; a general education setting for typically developing children or a special day setting for disabled children of all sorts. The two settings are also distinguished by classroom goals. The general education setting is one that is academically focused and will have larger teacher to student ratios while the special day setting is one that is focused on behavioral goals with smaller teacher to student ratios. As a result of a binary, rigid educational structure, it appears as though children with an autism spectrum disorder will have to accommodate this very structure rather than the structure accommodating them. This is not to say that schools will not make an effort to accommodate their students with disabilities. They will and they have to. However, the modifications and accommodations the schools are willing to make are contingent on the availability of resources and not necessarily any evidence based practices, and thus, makes them finite and very limited, including the ability of schools to properly train and maintain the continuity of training for their general education staff.

From an analytical perspective, the school structure, as an organizational system with bureaucratic constraints cannot see past these constraints and can often times end up unintentionally harming the students and families they are assigned to serve. Juxtaposed against their ASD students and families, the beauracracy seeks to operate with maximum efficiency that falls within the best interest of the hierarchy and not necessarily within the best interest of their ASD students and their families. These institutional arrangements will act as an impetus for parents to quickly adopt the role of educational and medical advocate as they seek to attain a diagnoses for their child in order to secure and manage educational services and proper educational placement for their disabled children. Further, the education and identity of children with an ASD are contingent upon the types of services they are able to receive and the educational setting they will be placed in.

Conclusion

With an increase in autism prevalence will inevitably come an increase in the general education placement and visibility of children with an ASD in public schools. While I.D.E.A. is a piece of federal legislation that affords these children certain rights, the organizational structure of a binary educational system with beauracratical constraints will influence a parent's role in their child's education to transform into that of educational and medical advocate. In addition, the ability to effectively navigate the special education process of public schools is one that will require a particular type of human capital, which not all families will possess. Further, the education and identity of the students with an ASD will be predicated

on the successful or unsuccessful management of embodied ASD symptoms on behalf of the school and the student's parents.

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Negotiating the Transition from Veteran to Student

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Introduction

Veterans have been using the G.I. Bill to pursue their post-secondary education since its inception in 1944; however, the current version of the benefit offers students what the American Legion calls “the most generous education benefit that our country has ever offered its military” (2015). In the first two years following the 2009 revision of the G.I. Bill, the number of program participants increased by nearly 71 percent (U.S. Department of Veterans Affairs, 2014). Additionally, recent reports anticipate a military downsize of as much as 20 percent, which, when coupled with the generosity of the new Bill, may result in an increase in the number of veterans attending college (Vacchi, 2012). This influx requires that “higher education faculty, staff, and administrators understand veterans and prepare to meet the needs of this rapidly growing student population” (Vacchi, 2012, p. 15).

It is with this information in hand that I seek to investigate how student veterans navigate their transition from the military to the small, politically liberal Sonoma State University campus. What strategies must they enact as they transition from a body and mind that is managed and monitored by a total institution to the relatively unstructured context of a liberal arts university? Given the potential increase in this population nation-wide, it’s important to assess the level of satisfaction among Sonoma State University student veterans, as well as identify any unmet needs that can be addressed at the academic, administrative, and social levels, in order to best support this growing population.

Literature Review

Historical Context

Student veterans were first identified as an emerging population warranting special attention following the Second World War (DiRamio, Ackerman, & Mitchell, 2008). The first G.I. Bill was signed into law by President Franklin D. Roosevelt in June 1944 and included provisions for educational benefits to veterans who had finished their tours of duty (U.S. Department of Veterans Affairs, 2013). However, it was not until veterans from the Vietnam War began returning home nearly 30 years later with symptoms of Post-Traumatic Stress Disorder that campus officials began to recognize the need for programs and procedures that addressed the unique nature of their circumstances (DiRamio, Ackerman, & Mitchell, 2008).

Veteran to Student

The Military as a Total Institution: Structure and Socialization

The total institution has an important role to play in the socialization of soldiers. Although Goffman (1962) focused his essays on this topic around asylums, he also included both prisons and the military as examples of total institutions. His interest in this research was driven by an understanding that the distinctive structure of these institutions leads to a specific type of developmental result that is difficult, if not impossible, to reverse once the individual is removed from these spaces.

A consolidation of the spaces we keep socially separate, the key feature of the total institution is that its members eat, sleep, and work all in one locale (Goffman, 1962). Total institutions focus on breaking its members from their past through a strategic collection of “abasements, degradations, humiliations, and profanations of the self” (Goffman, 1962, p. 7), followed by the implementation of new rules and restrictions to supplant the old. In the instance of the military, these activities take place during boot camp, a process which popular media has both glorified and demonized through the display of the often brutal methods employed to meet the goals of the institution.

The experience of basic training is epitomized by actions aimed at the deconstruction of personal identity, so that the institutionalized “warrior ideal” (Jarvis, 2009, p. 99) can be then molded from the remnants. The soldier should reflect the “cultural corporeality of a collective body politic” (Thompson, 2012, p. 837) by epitomizing “bravery, self-mastery, control, and courage under fire” (Jarvis, 2009, p. 99). The length of the deconstruction process varies from six-and-a-half weeks in the Air Force to thirteen weeks in the Marine Corps (Military.com, n.d.). Upon completion of this training, soldiers become easily identifiable due to the changes in posture, gaze, how they move, and their overall countenance (Hinojosa, 2010, p. 183). These physical changes reflect the successful completion of the socialization process, through which the enlisted soldier has adapted to the setting of the total institution by adopting the institution’s view of himself (Goffman, 1962).

Veterans on Campus: Framing the Transition and Connecting to Students

Scholars have defined ‘transition’ as any event that results in changed relationships, routines, assumptions, and roles (Schlossberg, Waters, & Goodman, 1995). Veterans begin to experience this transition immediately upon leaving the military base. Some experience more challenges than others during this movement from one social sphere to another. However, each must reincorporate themselves into civilian life and, should they choose to enroll in college, become familiar with the rules, regulations, norms, and expectations of a new system (Goodman, Schlossberg, & Anderson, 1997).

Baechtold et al. (2009) argue that the framework of the military “is distinctly different from that of higher education” (p. 39). They find that “the multiple cognitive, intrapersonal, and interpersonal dimensions that influence how...

veterans make meaning of their military experiences do not always connect with how they view themselves or how others on campus view them” (Baechtold & De Sawal, 2009, p. 39). DiRamio et al. (2008) build upon this research by identifying areas where universities can best assist with the transition of these students. They argue that the most important area to focus on is the connection student veterans experience with their academic counterparts (DiRamio et al., 2008). However, this can prove to be a difficult goal to achieve.

Due to their background and extensive training, veterans tend to possess a different level of maturity than their academic counterparts. Many veterans have travelled more extensively, have taken more leadership roles, and some may have lived in active combat zones or experienced battlefield trauma (DiRamio et al., 2008). Some even consider re-enlisting in the military, “where [they feel] a sense of camaraderie existed” (DiRamio et al., 2008, p. 86). It is interesting to note that these veterans preferred the possibility of being deployed to a war zone in order to rejoin their brothers in arms, over remaining in at their academic institution where no connection was felt at all.

Given how civilian life compares to many of the experiences a veteran has had, it is understandable that a relational divide may exist between two college students from these different backgrounds. Much of the existing research suggests that this lack of connection between veterans and other students is a hindrance to their academic success. However, a recent report from the Student Veterans of America association (Cate, 2014) reveals that 51.7 percent of enrolled veterans have received a postsecondary degree or certificate, which is higher than other non-traditional populations. This suggests that student veterans are not adversely affected by their backgrounds in their ability to complete their educations. However, the report does not investigate how their veteran status affects their overall ability to connect with other students and thrive within the academic community.

Blending In: Social Camouflage

A common transitional strategy for student veterans is the concept of ‘blending in’ and remaining unnoticed in the classroom setting (DiRamio et al., 2008). Some veterans express concern about being called out in the classroom by professors who do not honor the importance of their anonymity (DiRamio et al., 2008). This desire for anonymity is primarily driven by the perceived attitudes about the military, but also because other college students rarely employ the appropriate level of tact when discussing wartime events. In general, veteran students do not want to discuss their ‘kill record’ or whether or not they lost anybody on the battlefield with their civilian classmates (DiRamio et al., 2008, 88). Not only do these interactions violate the unspoken divide that separates the civilian experience from the soldier’s life, but is also seen as a tactless form of disrespect that reinforces the desire to remain unseen (DiRamio et al., 2008).

In reaction to, and perhaps in anticipation of, these types of encounters, student veterans engage in impression management strategies in order to camou-

Veteran to Student

flake themselves socially (Livingston et al., 2012). These efforts to ‘blend in’ can be so successful that student veterans become virtually invisible to every non-military member of their campus community (Livingston et al., 2012). These strategies comprise the central focus of my findings section, which is discussed below.

Methods

In order to understand how veterans navigate the transition from the military to the college campus, 10 semi-structured, in-depth interviews were conducted over the course of six months at a small liberal arts college in Northern California. This university is home to a student population of just over 9,000, 61 percent of which is female.

As military status is not tracked during the admissions application process, the university is unable to definitively determine how many veterans are attending classes at their campus. Therefore, in order to access this population for this study, the Veteran’s Affairs office confidentially identified potential participants through financial aid records, collecting the contact information from those students who make use of the Post 9-11 G.I. Bill. However, since veterans can pass this benefit to their family members, this recruitment method yielded a combination of both types of students. At the end of each interview, additional recruitment was attempted through the snowball method. However, each veteran identified through these secondary means had already responded to the request for participants through the primary recruitment method.

Once identified, two emails were sent on my behalf from the Veterans Affairs office requesting participation in this project. While this method had limitations, it was the only feasible way to gain access to this population. The university does not designate spaces on campus or have population-specific clubs where veterans can be recruited. Given the demographic information the campus VA office can approximate about this population, the 10 interviews conducted represent between 16 to 20 percent of student veterans on campus.

Interviews ranged from one half-hour to three hours in length, with an average time of 68.7 minutes. Each interview was then transcribed, coded, and critically analyzed for themes and concepts. The research sample consisted of 20 percent Coast Guard, 40 percent Marine Corps, 20 percent Air Force, 10 percent Navy, and 10 percent Army. 30 percent of participants identified as female and 70 percent identified as male. 80 percent of participants identified as Caucasian and 20 percent identified as Pacific Islander. Each interviewee was assigned a pseudonym in order to maintain confidentiality.

Findings

Getting the job done

During many interviews the theme of ‘getting the job done’ appeared in

relation to both military and civilian life. ‘Getting the job done’ directly addresses the question of how student veterans navigate the transition to college by suggesting that the socialization of the military remains deeply embedded beyond one’s time in the service and is carried through their reintegration into civilian life. As a socialized framework, ‘getting the job done’ is a strategy many of the participants personally enacted as they moved from an environment where their bodies and minds were heavily controlled by a total institution to the relatively unstructured context of a civilian university. Quite simply, they adapted by invoking their militarized socialization and applying it to the new setting and new goals. In fact, many of my interviewees saw this work ethic as one of their main assets as a veteran in a civilian world.

Frank, a young veteran who served as a reconnaissance Marine in Afghanistan, demonstrates the importance of this theme when asked what makes a ‘good soldier’:

“...getting the job done, leaving with the respect of the guys you worked with. [That’s] probably the biggest thing.” – Marine Corps, 26

Here, Frank links the value of getting the job done with the amount of respect you receive from your fellow soldiers. This idea reflects DiRamio’s (2008) research on the deep bonds that are developed between service members through the successful performance of one’s job functions.

Debra, a retired Coast Guard veteran, used the phrase when discussing the difficulties she faced while searching for employment after retiring from the service:

“So I think that’s one thing that the military sort of does well: getting the job done. And to me, that’s one thing that you would think would be employable. I can work with any body! And so there’s that disappointment of, “You don’t understand the leadership I bring you, you don’t understand that ‘getting the job done’ [mentality]. When I first retired, I wanted part-time work while I went to school. And I was over-qualified! ‘You’re gonna leave!’ No! I really want part-time work [laughter]! I can do this, this, and... and they would hire the high-schooler, or, you know, somebody else over me.” – Coast Guard, 55

Jennifer, a 57-year-old retired Coast Guard Commander, builds on the idea of ‘getting the job done’ in reference to the role that education plays in obtaining employment:

“‘Cause [that’s] the way the world works.[Employers] recognize people with higher education as somebody who’s capable and can do the job.” – Coast Guard, 57

By showing how important it is to ‘get the job done’ in areas outside of the service, both Debra and Jennifer reveal how elements of their military socialization have carried through into their civilian experience.

Veteran to Student

Walking it Off

The theme of ‘walking it off’ emerged when discussing the physical expectations placed upon those in the military. The National Education Association’s (Cate 2014) research on this population shows that, in general, veterans have been socialized to manage huge amounts of pain without complaint. This study supported those findings by showing that, when interviewing the veterans about their injuries or physical maladies, most of the responses were nonchalant. Therefore, I posit that a soldier’s perceptions of pain and injury are vastly different when compared to civilians’.

During one of my last interviews, Blaine supplied a great deal of information in support of the NEA’s research. As a Marine, everything about his job involved the use of his body, and thus, nearly every day in the service had the potential to result in bodily harm. This function of the Marine Corps differentiates it from the other branches of the Armed Forces in that all Marines are also trained as infantryman, regardless of their ultimate job assignment. Each Marine is expected to engage in combat on an as-needed basis, while the Navy, Air Force, Army, and Coast Guard do not incorporate this aspect into their job requirements. However, Blaine’s perception of this risk for bodily harm was not cast in a negative light; rather, he was quite matter-of-fact about the extent of injury that Marines can expect to incur:

“Basically every Marine will always have like a rolled ankle, and a lot of them will have blown knee caps. And that’s because the weight we have to carry is at least 100 pounds. And for infantry people, they will always carry at least 115. So I mean, that’s a lot of stuff to carry. It’s really hard on your back, it’s hard on everything. Everything hurts on your body, all of the time.” – Marine Corps, 25

Joshua, another Marine Corps veteran, also experienced a negative impact on his body during his service, which he continues to make accommodations for in school and on the job:

“Oh yeah. I have knee problems. I have tinnitus in my left ear. Headaches that are terrible. I have worse carpal tunnel because of it. Joint problems. It’s just terrible. But I take a lot of pain pills to try to help.” – Marine Corps, 22

Justin served as a heavy machine gunner in the Marine Corps, which means that he shot 50-caliber machine guns on the top of Humvees while on convoy, as well as medium machine guns while being attached out to other platoons who were lacking someone in their unit with his skill. When I asked him if he sustained any injuries in the military that affected his ability to succeed in the classroom, he said:

Participant: “I was a heavy machine gunner, so...well, I say I’m

partially deaf. I haven't actually had that tested, but..."

Interviewer: "Why not?"

P: "It could be a masculinity thing, like, 'Oh I'm not hurt! I'm just gonna, you know, walk it off.' I mean, I've played sports all my life, that's the mentality, like, 'Oh you're not hurt. Get up and keep going.' I actually hurt myself in boot camp, I pulled a muscle in my back, and still did the physical fitness test, which was a 3-mile run and as many pull ups and sit ups as you can do, and the odd thing about that, is that even though I was hurt, I still did the most pull ups I've ever done 'til this day, and I don't know how." - Marine Corps, 30

Coupling the 'walk it off' mindset with the pain perception factor suggests that veterans may be unlikely to seek assistance once they reach an academic setting. According to Vacchi (2012), it is critical for staff and faculty to understand that while "veterans can generally adapt and overcome challenges due to a spirit of persistence ingrained into the military psyche," (p. 18) they can also "mask their own needs even if they are simple to address" (p. 18).

Staying Under the Radar: The College Experience of Student Veterans

A main focus of this research investigated the college experience of student veterans, a concept which was analyzed through the participant's discussions around the disclosure of their veteran status. Of the participants that were interviewed, most were reluctant to self-identify as veterans to faculty or classmates. Several opted to do so once a relationship had been developed, but it typically was not an immediate disclosure. Joshua shares his experience with disclosure at Sonoma State:

Interviewer: Do you generally disclose to your veteran status?

Participant: No. When I first got here, I hid it. It didn't seem very welcomed. Not very many people took an interest, or even cared. And then sometimes people would take advantage of the benefits. 'Cause, when you're in the Marine Corps, a lot of people do try to take advantage of the benefits you have. So when I got out, I kinda kept that same mentality.

I: Taking advantage of...?

P: Say I have reduced prices for things, or I can...it's a status.

I: Taking advantage of you? For your benefits?

P: Yes.

Veteran to Student

Joshua's specific experience was not echoed by other participants, but all had their reasons for staying under the radar. Some felt as if they wanted to distance themselves from their time in the service, while others had families and careers, which made their veteran status more of a background characteristic of their identity, rather than a primary focus of their current experience. Many also suggested a lack of interest in being classified as a special or unique population, which may be another reason for nondisclosure.

In general, Sonoma State University student veterans see themselves as self-sufficient and actively resist any sort of categorization that identifies them as needy or disadvantaged. This finding is supported by Vacchi's (2012) research which states that this mindset is why "so many cases of post-traumatic stress, anxiety disorders, alcohol and drug addiction, and medical issues go undiagnosed and untreated: [because] veterans do not want campus community members to view them as weak or dependent upon anyone for assistance" (p. 18). Jennifer discusses this self-perception in regards to her extensive service in the Coast Guard:

Participant: As aviators we always looked at ourselves as the heroes. You know, we'd go out on the high seas, dark and stormy nights, and we would save people from sinking and dying. I happen to be very self-sufficient, independent. [But] I think, we're all different. We're coming from all different stages. Some of us are much older, and have been around the block several times and don't have necessarily a big need for a net. Some others really do, I would imagine. It just depends on who you are, and how old you are. If you have a family, if you're married, if you're single, divorced, and so on." – Coast Guard, 57

Here, Jennifer identifies an important point about what type of veteran demographic might need more support than others. Participants over the age of 40, who were established with a family and a home, seemed less likely to 'need a net' than the younger veteran interviewees. Among those under the age of 40, several suggested that increasing the amount of social support for veterans at Sonoma State University would help them feel more welcome.

Joshua discusses how he feels the school could improve their services:

I: Are there any services or people on campus that you've found especially helpful, on campus, that helped you be successful?

P: Not really. I've been pretty independent. Kind of doing my own research. Cause there's not a lot for us here. I would like it if there's a lot more help. Yeah, I feel really lost some times as a veteran on this campus.

I: Yeah. As far as like, where to find things, or how to do forms?

P: Well, how to do forms, how on-track I am for graduating. Like, I, as a veteran, I can't always can't go to my advisors too, 'cause they're advising everybody.

I: And it sounds like you found most of the campus services on your own?

P: Yeah. I had heard of people going to [Counseling and Psychological Services]. And then finally it was like, I'll just go to CAPS. I didn't even know about it until a few semesters after [I started here].

I: Right, right. But it'd be nice to know about the...

P: It would have been nice to know about CAPS earlier, yeah.

Joshua initially rejected the need for additional assistance or services due to his status as a student veteran. However, as the conversation progressed, a need for advising and access to counseling services became apparent. This connects back to my finding of the 'walk it off' mindset, which suggests that, due to their military training, veterans may be unlikely to actively seek assistance once they reach an academic setting. Vacchi's (2012) research in this area asserts the importance of acknowledging that "veterans [are] trying to avoid being a burden to others," (p. 18) which is possibly another explanation for why veterans may not self-identify: "if no one knows the student is a veteran, there is no shame in asking for help" (p. 18).

A collective experience was cited by several participants in response to the interview question, "Have you ever felt that you were treated with dishonor or disrespect on campus because of your military status?" Shortly after Veterans Day, 2013, a negatively perceived 'Letter to the Editor' from an SSU professor was published in the campus newspaper. Many interviewees referenced the article as a source of frustration, although they did not directly link it to their lack of disclosure. However, it's possible that when combined with the politically liberal climate of the county and the lack of dedicated services, this editorial may have left student veterans feeling as if there are no positive reasons to disclose their status.

Recommendations

Many of the university's student veterans provided feedback about the programs and services made available to them. While most of the veterans interviewed place a significant value on their anonymity, they also recognized that efforts could be made on their behalf to increase their sense of community and inclusivity. From these, the following recommendations can be made:

Veteran to Student

1. Campus Veterans Affairs administrators should understand that “the motivations for attending college are common among most students, including student veterans” (Vacchi, 2012, p. 20). Therefore, “a basic awareness of the resources available at a college or university, or to whom a veteran can go for assistance, and a generally helpful staff and faculty is the best way to help student veterans to succeed” (Vacchi, 2012, p. 21).
2. In the spirit of recommendation number 1, the University should provide campus orientations leading up to or upon arrival for student veterans, which include information about the services and programs available to them specifically, as well as those available to the campus community as a whole.
3. The University should provide information to the campus community about the student veteran population at SSU, making particular note of appropriate interactions (e.g. avoiding questions about one’s ‘kill record’).
4. Faculty should avoid asserting their opinions about the military. For instance, making claims about the perceived “illegality of the war in Iraq” (Vacchi, 2012, p. 20) may create an uncomfortable or hostile environment for the student veteran.
5. The University should provide veteran-specific academic advising, as well as individualized financial aid assistance. Each university has its own rules for how their student veterans collect and apply their G.I. Bill benefits.

Discussion and Conclusion

In this research I explore the college experience of Sonoma State University student veterans. My main interest is in the navigation of these identities in the transition from a total institution to the relatively liberal culture of the university campus. Through my interviews, I found that the identity changes that occur during one’s time in the Armed Forces do not simply revert back to a civilian status once one is discharged. Rather, this change is permanent, forever “impacting [veterans’] worldview and [their] interactions with others” (Livingston et al., 2012, p. 180).

Three major themes have emerged from my examination of the interview data: *Getting the Job Done*, *Walking it Off*, and *Staying Under the Radar*. Through the exploration of these concepts in my interviews, I’ve expanded upon the existing knowledge surrounding the needs of student veterans and the identity management strategies they must engage in, in order to successfully navigate their expe-

rience at a civilian college campus. I've also identified areas where Sonoma State University can improve upon their programming and resources for this population.

While my research yielded a plethora of data and the findings are generally consistent among all participants, the small sample size limits my ability to generalize my conclusions to the student veteran population nation-wide. In the future, I would like to expand upon this research by continuing my interviews with student veterans, focusing on the themes that have emerged thus far. Additionally, I would like to incorporate more interviews with female veterans and analyze their experience of transitioning to college with a militarized socialization in comparison to their male counterparts.

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Veteran to Student

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Carnobacteriocin BII Peptide Bactericidal Assay

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Abstract

The prevalence of the reemergence of disease has dramatically increased over the last decade. As a result, the demand for novel antibiotics and antiseptics is crucial to parallel the upsurge of disease. The following article addresses to characterize a novel class of antibacterial peptides, Carnobacteriocin BII- a peptide produced by *Carbacterium Piscicola*. This experiment implements a Molecular Probes' LIVE/DEAD® *BacLight* Bacterial Viability Kit, which enables the enumeration of bacteria killed as a function of peptide concentration. Thus Carnobacteriocin BII efficacy to kill bacteria is explored and characterized with the use of the LIVE/DEAD® *BacLight* Bacterial Viability Kit.

Introduction

Microorganisms coexistence with nature and man is fundamental to life: microorganisms (e.g. bacteria) participate in environmental nitrogen & carbon cycling, degrade & recycle organic waste, and have unique functions colonizing the various physical niches of our body. In addition, our relationship with microorganisms stands on a fragile equilibrium. Perturbations introduced to this fragile equilibrium (i.e. overuse of antibiotics, declining vaccination rates, etc.) can physically alter the nature of a microorganism and their relation to humans, which causes the potential to create a pathogen.

Subsequently, the overuse of antibiotics and supplements (e.g. vitamin D) has sparked a steady increase in the incidence and prevalence of chronic disease and communicable diseases (e.g. rubella, polio, tuberculosis, etc.) on a global scale. That is the more we use antibiotics; the more bacteria are becoming resistant to them. That is a fact of microbial life. As a result, antibiotics like penicillin are helpless against the infections they are used to cure. We are losing our life saving drugs one by one (Bloice 2006).

Furthermore, in 2004, almost half of all Americans, or 133 million people, lived with a chronic condition. That number is projected to reach 157 million by 2010. Chronic disease and communicable disease, previously, were thought by the medical community to have no relation. Yet over the last past century this line has been obscured and medical paradigms have been challenged.

For example, ulcers that were originally thought to originate from stress, eating spicy food, or an excess of stomach acid. Yet, in 1984 Dr. Marshall found and proved a bacterium called *H. Pylori* was the causative agent of ulcers. Twelve years later in 1994 that the National Institutes of Health in America published an

Carnobacteriocin BII

opinion stating that most recurrent duodenal and gastric ulcers were caused by *H. pylori* and recommended that antibiotics be included in the treatment regimen.

Lastly, it is essential to begin looking for new ways to combat the steady rate of disease by searching for new and safe antibacterial drugs. One novel area of interest is toward the use of a class of antibacterial peptides, which is produced by *Carbacterium Piscicola*. These peptides exhibit antimicrobial activity via membrane permeabilization against several species of lactic acid bacteria including food spoilage agent and human pathogen *Listeria monocytogenes* (Arnold 2012).

The Characterization of the Carnobacteriocin BII peptides will lend insight on how these peptides can be used as future potential novel antibiotics. Past work, which was conducted at Sonoma State University proved to be successful in cloning the CbnB2 gene into a pTYB11 vector, and in their expression. Yet, characterization of the CarnobacteriocinB2 peptides and its derivatives remains yet to fully characterized.

Therefore, the following article addresses to elucidate the bactericidal -defined to be a substance that kills bacteria- extent on an array of antibacterial peptides (i.e Carnobacteriocin BII and its derivatives) on several target bacterial strains. The following experiment implements the use of a Live / Dead BacLight Bacterial Viability Kit. This kit allows a rapid, yet reliable way to differentiate between live and dead bacteria in minutes; thereby helping to further characterize the nature of Carnobacteriocin BII and its derivatives.

Methods

Preparation of Tryptic Soy Broth and Culturing of Listeria Monocytogenes

The media necessary for the growth of *Listeria Monocytogenes* was prepared by adding 60g of *Tryptic Soy Broth* (Soybean-Casein Digest Medium) into a 1L Erlenmeyer flask. This media was then autoclaved for over the duration of an hour along.

Next a single colony was picked from a plate of streaked *Listeria Monocytogenes* and inoculated into a 25mL falcon tube. This culture was allowed was incubated in an Innova 4080 Incubator Shaker at 30°C and 250rpm. The culture was incubated for 15 hours, until the bacterial media reached an optical density of 0.02. A 0.250mL aliquot of this culture was then transferred to a 250mL flask containing 25mL of TSB. Once the bacterial media reached an optical density of 0.020, the killing assay began.

Standard Killing Curve

The purpose of the following experiment was to generate a linear curve to correlate viability to green and red fluorescence. For the following, *Listeria Monocytogenes* was grown to late log phase in nutrient broth. Thereafter, a pellet was formed by concentrating 25 mL of the bacterial culture by centrifugation at 10,000 × g for 10–15 minutes. Next, the supernatant was removed and pellet

resuspended in 2 mL of 0.85% NaCl.

Thereafter, a 1 mL of this suspension was added to two 30–40 mL centrifuge tubes containing either 20 mL of 0.85% NaCl or 20 mL of 70% isopropyl alcohol (for killed bacteria). Both of these suspensions were incubate at room temperature for 1 hour, mixing every 15 minutes. Lastly, pellets of both samples were formed by centrifugation at $10,000 \times g$ for 10–15 minutes. These pellets were then resuspended in separate tubes with 10 mL of 0.85% NaCl.

Lastly, each tube was diluted separately to the optical density of 0.02. The dead population and viable population of bacteria were then mixed in different proportions. A bacterial viability assay was then implemented to correlate bacteria viability to green to red fluorescence. This killing curve was preliminary data for the correlation of observed green to red fluorescence to viability during future microwell plate killing assays.

Microwell Plate Killing Assay

A standard 96-well plate was utilized for this experiment. The first well of the plate contained the blank of the experiment, which contained 50 μ L of pipes buffer and tryptic soy broth (TSB). The next well contained 50 μ L TSB and 50 μ L the bacterial strain used in the experiment (i.e. *Listeria Monocytogenes*)- all aliquots of the bacteria were added last. The third well contained pipes buffer and 50 μ L of the bacteria. The fourth well contained the 100 μ L of the concentrated antibacterial peptide. The fifth well contained 50 μ L of pipes buffer. *Listeria Monocytogenes* was then added to was added as needed to the following wells and to wells six through ten.

Lastly, a 50 μ L of the peptide was taken from the fourth well and diluted in 50 μ L of pipes buffer in well 5. Thereafter, two-fold dilution were made by withdrawing 50 μ L from well 5 and pipetting it into well 6. This process was followed sequentially into well ten contain the least concentrated form of the peptide. A live/dead baclight kit was implemented immediately after to quantitate bacterial viability.

Bacterial Viability Assay

In order to quantitate number bacterial cells alive versus dead a Molecular Probes' LIVE/DEAD® BacLight Bacterial Viability Kit was used. The following kit came equipped with two different dye reagents (i.e. SYTO9 and Propidium Iodide), which would stain live cells green and dead cells red.

Specifically, 6 μ L of component A (SYTO 9 dye, 3.34 mM) was mixed with 6 μ L of component B (Propidium iodide, 20 mM) in a microfuge tube. A 2X stain solution was prepared by adding the entire 12 μ L of the above mixture to 2.0 mL of filter-sterilized dH₂O in a falcon tube and mixed.

Thereafter, 100 μ L of the 2X staining solution were pipet to each well and mix thoroughly by pipetting up and down several times. A new ip for was used

Carnobacteriocin BII

for each well.

The solution was allowed to incubate at room temperature in the dark for 15 minutes. After, each plate was then analyzed by a Perkin Elmer Luminescence Spectrometer L550B or Synergy 2 Multi-Mode Reader. The Synergy Multi-Mode Reader was set to measure fluorescence emission at 530nm and 590nm- these are the emission points the plate reader is equipped to read. The Synergy Multi-Mode Reader uses a filter wheel that equipped to read a limited number of emission points, which is based on the band-pass filters it is equipped with.

Results

A standard killing curve was generated dividing the green to red fluorescence of against bacterial viability (A.1). This curve generated was linear as expected, however, the raw data did not agree with the expected mechanism of the dyes. That is the green emission was not inversely proportional the red emission. There are more complicated issues, which had not been foreseen.

The following spectra was obtained by inoculating *Listeria Monocytogenes* with 50 μ L of a 3% solution of H₂O₂. Two-fold dilutions of the solution were made across a series of wells to obtain the following spectra (A.2). During post-incubation relative peak areas for bacteria stained red (dead, 620-650 nm) vs. green (live, 510-540nm) were integrated. This data as reference of to generate a standard killing curve.

The following spectrum was obtained by inoculating *Listeria Monocytogenes* with 62nM of the Carnobacteriocin BII peptide. Two-fold sequential dilutions of the peptide and *L. Mono* were made and several spectrums were obtained. The spectra obtained by the two-fold of the concentrated peptide were extrapolated and relative peak areas for bacteria stained red (dead, 620-650 nm) vs. green (live, 510-540nm) were integrated.

Discussion

The results obtained demonstrate that Carnobacteriocin BII possesses killing potential against *Listeria Monocytogenes*. Incremental increases in concentration of the Carnobacteriocin BII peptide shows to decrease relative green emission (530nm). It can be inferred that bacteria are dying with increasing concentrations of the antibacterial peptide- this is a qualitative assessment of the spectra.

However, it was indicated that proposed mechanism for the dyes did not agree with the observed results. That is the red fluorescence emission does not have an inverse relationship with the green emission. It was found through investigation of the literature that there exists an 'emission Spectrum of SYTO [that] overlies the excitation spectrum of PI, indicating a potential for fluorescence energy (FRET) to occur¹ ... [however] increasing the

to the spectra emitted, although the PI emission was relatively unaffected. This may arise as the result of a tradeoff between the affinity displacement and a reduction FRET due to desorption of SYTO9¹.

Hence, the concentrations of the dyes will need to be varied, and raw data observed. The correct concentration of PI and SYTO 9 needed will be determined through this method. However, another complication was indicated during this experiment. That is that the filter wheel is equipped with a limited number of band-pass filters. A band-pass filter that reads exclusively at 630nm will need to be bought or provided by in order for this experiment to make any significant progress.

Lastly, all complications of this experiment have been mentioned. All problems mentioned need to be resolved, if any statistically valid conclusion is to be made- that is the quantitative conclusion Carnobacteriocin BII kills. However, a qualitative inference can be of the inversely proportional relationship of propidium iodide's emission with carnobacteriocin concentration. That inference is the peptide does kill.

Conclusion

The following results suggest that Carnobacteriocin BII does demonstrate a killing efficacy against *Listeria Monocytogenes*. This inference was made from the inversely proportional relationship between SYTO 9 and Carnobacteriocin BII concentration- this indicates that at high peptide concentration, viability goes down.

However, a complication that arose during this experiment is that the red fluorescence emission does not have an inverse relationship with the green emission. The correct concentrations of PI and SYTO9 at which the emission of SYTO9 is inversely proportionally PI's emission will need to be elucidated. Thereafter, a statistically valid claim with quantitative results would be able to confirm the Carnobacteriocin BII killing efficacy.

Lastly, it is hoped that future results will elucidate the correct concentrations of PI and SYTO9 needed that is consistent with the proposed mechanism. Thereafter, a killing curve experiment will be re-tried along with killing assays of Carnobacteriocin BII. However, this can only be done if all the problems mentioned previously are resolved (i.e. a band-pass filter bought).

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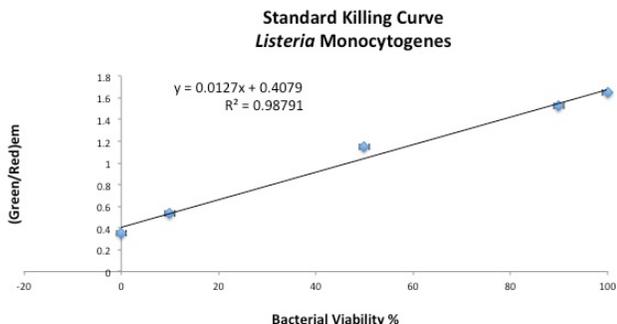
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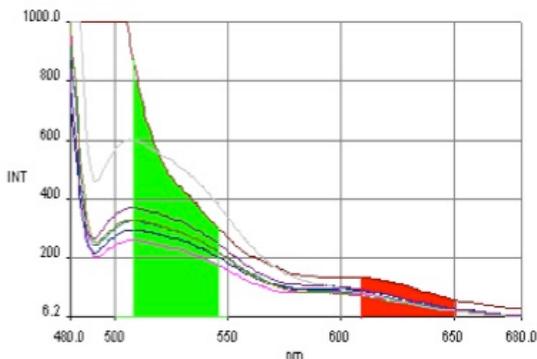
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Appendix

A.1 Standard Killing Curve



A.2 Bactericidal Assay for H₂O₂ (v/v) %.



Injured on the Job: The Missing Safety Net Affecting Injured Day Laborers in Residential Employment in California

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Research Mentor: Daniel Malpica, Ph.D.

Abstract

This study asks: what is the impact on day laborers and homeowners in excluding day laborers in residential employment from workers' compensation insurance in the state of California? Day laborers in the United States are typically defined as young recently arrived Latino immigrants soliciting work on street corners, Home Depots, and at worker centers. Whether on a street corner or at a worker center, day laborers are hired for a short time-span to do a variety of tasks such as landscaping, moving, construction, and yard-work during which they face some of the highest rates of injury in the workplace. However, workers' compensation insurance, one of the oldest social insurance programs in the country, presently excludes day laborers by nature of the terms of their employment and industry. This study aims to understand how day laborers are excluded from workers' compensation insurance and furthermore, expose how day laborers and employers are adversely affected by the lack of workers' compensation insurance. The mixed-methods approach used to investigate this inquiry will include surveying 30 day laborers from the Graton Day Labor Center (Centro Laboral de Graton) in Graton, CA. The purpose of the survey seeks to provide insight into the context of the day labor market. Additionally, 10 day laborers will be interviewed to unearth the nuances found in the personal accounts of how the lack of workers' compensation insurance raises serious concerns for both parties.

Introduction

Every morning in California, young Latino immigrants stand on street corners as they wait for potential employers to hire them. Day laborers many of whom have recently migrated from Latin America have come to the United States in search of work, show up at these hiring sites uncertain if they will be hired. A typical day will include an employer driving up to the corner to hire workers. Day laborers hurriedly amass around the employer's truck jockeying for position to get the employer's attention. The employer will pick the "best looking" workers and will be off as quickly as he had arrived (Malpica, 2002). This scenario will take place many times on any given day on numerous street corners across California. But street corners are not the only places where employers can hire day laborers. Many street corners over the years have been organized into worker centers. The Graton Day Labor Center is an example of such a worker center.

Day Laborers

Located in Sonoma County, California, the small-unincorporated rural town of Graton is a stark contrast to the typical urban setting of day laborer hiring sites. The pastoral setting of Graton and the surrounding communities are indicators of the types of hiring that take place here. Many are hired by residential homeowners to provide a helping hand around the house such as landscaping, gardening, or moving to another home¹. The informality of the day labor market leaves workers in a vulnerable situation when it comes to one particular risk: injury. Though a worker center affords considerably more advantages for day laborers as compared to being on a street corner, the question of injury persists as a serious concern for both day laborers and their employers. This concern is well-founded in that many of these workers will not qualify for workers' compensation insurance (WCI) leaving them injured and without recourse, which this paper will explore further on. As an option, some day laborers may choose the civil litigation route to cover medical expenses. This is what employers would hope to avoid. In the end, the situation leaves both parties in an unfortunate situation.

This study has partnered with the Graton Day Labor Center (Centro Laboral de Graton) to provide insight into the lives of day laborers. Who are day laborers? What kind of work do they do? Who are their employers? What is worker's compensation insurance? These are the fundamental questions that help provide the setting for the more challenging questions this research plans to ask. How are day laborers working for residential employers excluded from workers' compensation insurance? How would workers' compensation insurance benefit both day laborers and their employers? And because they cannot benefit from worker's compensation, how are they adversely affected as a result of it? The expectation of this study is to help shed insight into the need for inclusion of day laborers under workers' compensation coverage.

Literature Review

Over the recent years, numerous studies have contributed meaningful research focusing on the machinations of the day labor market. Much of this research builds upon the pioneering work of Abel Valenzuela, Daniel Malpica, Janice Fine, and Nik Theodore who, amongst many others, have contributed significantly to our present understanding. The most challenging aspect many have had to wrestle with is the simple question of who day laborers are. Though this question may vary region to region, from Los Angeles to New York, or even country to country, the general consensus is that most day laborers are male, foreign born, recently arrived and unauthorized, and have low levels of education and a poor command of English (Valenzuela, 2003). The predominantly abridging characteristic between day laborers is their gender and immigrant experience. As Malpica notes, men compose the vast majority of those participating in the informal day labor market. Additionally, the fact that many have recently migrated

1 Though a significant portion of residential employers are renters for purposes of this paper when referring to homeowners I also include renters under this label.

to the U.S. and speak Spanish brings them together (Malpica, 2002).

The experience of migration is a common staple of day labor in the U.S. In the New York area, 88% of day laborers are migrant workers from Mexico, Central America, and South America (Theodore, Melendez, & Valenzuela, 2006). Many of them have left their home countries for a variety of reasons traditionally rooted in the push-pull forces of migration. The life of a Latino immigrant day laborer is a story based on the intersection of globalization, economic restructuring, the transformation of employer-employee relations towards informality, and push-pull migration (Valenzuela, 2003). These forces drive the narrative of day labor in modern America. Looking back to 1986, the passage of the Immigration Reform and Control Act (IRCA) during the Reagan administration marked a turning point in labor relations as newly introduced employer sanctions could be levied for hiring unauthorized immigrants without legal status (Malpica, 2002). IRCA proved to be a watershed moment as the labor market shifted towards informality and employing day labor as an alternative form of labor became standard practice. The major motivation for employers to shift towards day labor was the opportunity to classify, whether appropriately or not, day labor as “independent contractors” allowing them to circumvent several immigration-status related restrictions (Valenzuela, 2003; Fine, 2006).

Day laborers participate in an unregulated cash-based informal economy. Much of their income is untaxed, hidden from social security, and often fails to comply with certain labor law provisions (Valenzuela, 2003; Theodore, Valenzuela, & Melendez, 2006). But many of those labor law provisions were legislated at a time much different than the modern day. As Janice Fine writes in her groundbreaking work *Worker Centers: Organizing Communities at the Edge of the Dream*, “The majority of American labor market and social insurance policies at the federal and state levels are terribly mismatched to these current economic structures. They are premised on a 1930s understanding of employment relations that simply no longer exists for low-wage workers...” (Fine, 2006).

The U.S. economy thrived on manufacturing for much of the 20th century but shifted during the latter half of the century towards the service sector changing with it much of the established labor relations from the 1930s. The dismantling of manufacturing-based unions and building trades produced a vacuum in labor that has since been filled by the informal economy (Valenzuela, 2014; Fine, 2006; Theodore, Valenzuela, & Melendez, 2009). These new informal and service sector markets allow for the misclassification of day laborers as independent contractors, pay cash, and avoid paying any benefits (Theodore, et al, 2006). The employment trend has shifted from full-time, permanent, direct-hire to more informal, contract, and temporary arrangements (Asfaw, 2014). This type of deregulation is essential to modern capitalism (Valenzuela, 2014). As Melendez notes about informality, it is “allowed to flourish under the laissez-faire conditions and landscapes of deregulation, which typifies informal and contingent labor markets in the United States” (Melendez, Visser, Theodore, & Valenzuela, 2014, pp. 837).

Day Laborers

It is no wonder that modern capitalism in the U.S. reflects neo-liberal policies both domestically and abroad. Day laborers work and live at the intersection of globalization, economic restructuring, informality, and immigration on the street corners of Los Angeles and in worker centers in the San Francisco Bay Area. On those streets, thirty to forty immigrant day laborers wait for work in a chaotic scene that is less regulated than before. Today, the moment an employer drives up and hires a worker they do so evaluating the workers based on appeared human capital within the context of an informal economy (Valenzuela, 2003).

Beyond the larger implications of the informal economy, the consequences of this economic order impacts day laborers on an individual basis. As immigrants they have faced many perils along their journey to this country. Once they arrive to this country, the day labor market poses even more significant challenges. The day labor market is an informal labor market that includes the uncertainty and unpredictability of work, the vulnerability to exploitation, and constant fear of deportation (Fine, 2006). One of the principal tenets of informality, which has concerning repercussions, is the lack of worker's compensation insurance and work-related injuries.

Day laborers face dangerous working conditions including the reality of employers circumventing worker's compensation insurance, either intentionally or not (Theodore, et al, 2008; Theodore, et al, 2006). They frequently have different employers and are employed at different job sites doing different types of work. This irregularity can lend itself to injuries on the job. As found by a study conducted in San Francisco with day laborers published in the *Journal of General Internal Medicine*, day laborers engage in occupations that are among the most dangerous in the country. The lack of training and experience coupled with inadequate safety equipment makes for a hazardous work environment (Walter, Bourgois, Margarita Lonaiz, & Schillinger, 2002). With so many day laborers working in construction, it is no wonder that they have higher rates of injury considering that a construction laborer is eight times more likely to be injured on the job than for the average job (Walter, et al, 2002). In Washington D.C., 79% of day laborers reported that their job was dangerous (Theodore, et al, 2008).

Normally, when an employee is hurt on the job, the injured worker has access to benefits under the employer's worker's compensation insurance (WCI) policy. By law, an employer must carry a workers' compensation insurance policy in case of a work-related injury. However, the question of whether day laborers are eligible for worker's compensation insurance benefits is far more complex. Specifically adding to this complexity is whether day laborers are eligible for WCI benefits if injured on the job while working as residential employees, which is the focus of this paper.

The concept at the root of workers' compensation insurance is quite simple: it serves as a trade-off between employers and employees. When an employee is injured on the job they receive benefits such as medical coverage while the employer is protected against litigation from the employee. The employee receiving immediate treatment for their injury means they are foregoing their right

to sue their employer in tort (Query, 2006; Hwang & Kleiner, 2002; Fowler, 2013).

Workers' compensation insurance is the oldest social insurance program in the country having started in the early 1900s (Hwang & Kleiner, 2002). The primary principle of workers' compensation insurance has been to protect workers who are susceptible to abuse (Query, 2006). However, California Labor Code 3352(h) poses significant challenges to this underlying principle of worker's compensation. For residential employment, CA Labor Code 33352(h) requires employees work a minimum of fifty-two hours within ninety days from the date of the injury to be eligible for workers' compensation insurance. The typical terms of employment for day laborers will exclude many from accessing the benefits of workers' compensation insurance.

This paper seeks to understand how the terms of residential employment excludes a significant number of day laborers from accessing workers' compensation insurance. How does this lack of coverage adversely affect day laborers and residential employers? In what ways has the development of the informal market influenced this gap in workers' compensation insurance coverage?

Methods

This study seeks to answer the question of how residential employers and day laborers are impacted by the lack of workers' compensation insurance through the use of mixed methods. A survey of thirty-day laborers from the Graton Day Labor Center will be conducted with the purpose of contextualizing the day labor community. The survey will consist of questions aiming to gather demographic information, working conditions, and assess the impact injuries have had on the lives of day laborers.

The heart of the research will be informed through the use of interviews. Ten day laborers will be interviewed. Day laborers will be asked about their experiences with injuries in the workplace and how workers' compensation insurance, and the lack thereof, has affected them. Transcribing and coding methods will be used to qualitatively analyze data from these interviews.

Discussion

There are numerous challenges this researches faces. The primary challenge is the transient nature of day laborer populations. The constant flux means a data sample can vary significantly season to season, and location to location. Important to note are the day laborers who will not be surveyed or interviewed due to migration elsewhere, those who have obtained permanent employment, or are permanently injured, with the last being perhaps the most significant in helping shed light on the hazards faced by day laborers in the informal labor market. Additionally, a substantial number of day laborers are unauthorized immigrants, which could affect their willingness to participate in a survey or interview.

Day Laborers

Currently, state legislature debates on workers' compensation center on reform with much of that conversation focusing on controlling medical expenditures and high premiums affecting businesses (Query, 2006; Meza & Kleiner, 2010). The coverage gap affecting day laborers and their residential employers exposes several narratives that go beyond what may be deemed as a niche labor market. In fact, day laborers work within a labor market that includes many others, namely, domestic workers who are a part of the growing informal sector of the U.S. economy. This research intends on providing a foundational basis on the intersection of day labor, residential employment, and workers' compensation insurance in California. The expectation of this study is to see a public policy proposal develop as a result of the findings. Any public policy must take into account that though including day laborers into the framework of workers' compensation may help formalize their industry the policy should not harm day laborers' opportunities for employment within that informal labor market. As such, any public policy proposal must hold at its heart the spirit of workers' compensation insurance, which is "to mitigate the suffering of employees when they suffer an injury during the scope of their employment" (Meza & Kleiner, 2010). This, of course, includes day laborers.

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The Connection Between Colonialism, Imperialism and Modern Slavery

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Research Mentor: Joshua Glasgow, Ph.D.

Abstract

The purpose of this research is to examine if there is any connection between colonialism and imperialism and modern slavery. The first prediction is that nations that were colonized and imperialized will have higher rates of modern slavery than nations that had colonial and imperial power. The second prediction is that the earlier the nation gained its independence, the lower the rates of modern slavery. The data in this paper were assembled from two main websites, the first website provided the date for independence of each sovereign state and the second website was used to calculate modern slavery rates. The result of this research demonstrates both predictions to be true. In Figure 2, the pie chart reveals that colonized and imperialized nations have higher modern slavery rates than colonizing and imperializing nations. In Figure 3, the scatterplot graph shows that the nations that had independence early had lower rates of modern slavery than nations with later independence. One possible explanation for this is that nations that have had their independence longer have had more time to establish and strengthen their governments' structure, creating access to various resources that are unavailable to developing nations.

Introduction

Colonialism is a practice of power, which is the suppression of one people by another (Kohn, 2006). It also involves foreigners becoming permanent settlers in a new land and possessing power over the politics and economics of that land. Examples of countries that were colonialized are Australia, New Zealand, Algeria, South Africa, and most of the countries in South America (Kohn, 2006). "Imperialism is another form of practice of power by the foreign government controlling the politics and economics of the territory without major settlement (Kohn, 2006). Often, foreign nations such as Britain would recruit the native leaders like the chief of a village or an indigenous person of that land to enforce imperialist laws (Iweriebor, 2011). Some examples of the nations that were imperialized included: the majority of the countries in the continent of Africa, the Philippines, and Puerto Rico. The difference between imperialism and colonialism, as it has been defined above, is that colonialism involves settlement and imperialism is about indirect forms of control (Kohn, 2006). The similarity between colonialism and imperialism is the exploitation of group of the people and land to benefit another county (Kohn, 2006). In many nations that were colonialized or imperialized, slavery was

the main way to oppress the indigenous population (Iweriebor, 2011). Often it was done for economic purposes (Iweriebor, 2011). Slavery might happen indigenously or by transporting native populations to other nations (Iweriebor, 2011). Of the crimes listed under “Modern Slavery” in the UN Trafficking Protocol of 2000, most were repeatedly committed by imperialistic and colonializing nations.

Modern Slavery is an exercise of slavery and other practices that are associated with forms of subjugation such as: debt bondage, forced marriage, and the sale or exploitation of children, human trafficking, and forced labor (Walk Free Foundation, 2013 Index). What follows is a brief clarification of each of these categories in the definition of modern slavery. *Debt bondage* is when someone works with the purpose to pay off the debt(s) or the debt(s) of their loved ones, but in reality, the debt is an excuse for the oppressor to keep the victim under a controller; often the debt is unspecified, which makes it very easy to increase abuses which repeatedly happens (Walk Free Foundation, 2013 Index).

Forced or servile marriage is when somebody is forced into marriage and a great amount of money is given to the parents or guardian. The individual who is married has no right to refuse the marriage; the individuals are considered their spouse’s possession and have no rights (Walk Free Foundation, 2013 Index). The death of a spouse does not guarantee inheritance by their spouse; often they are married off to another person in the family. *Child Marriage* as forced marriage is a crime (Walk Free Foundation, 2013 Index). It must involve children under age 16, who are too young to provide willing consent. The exception is when they are two people close to age 16, and are both consenting, with additional consents from their parents (Walk Free Foundation, 2013 Index). *The sale or exploitation of children* happens when a child under 18 years of age is forcefully relocated for the purpose of sexual activities, child soldiering, or other abuses (Walk Free Foundation, 2013 Index). *Human Trafficking* is the recruitment, transportation, transferring, harboring or receipt of persons involuntarily (Walk Free Foundation, 2013 Index). To be considered a human trafficking victim, a person must prove they were threatened, defrauded, deceived, abducted, or in a position of vulnerability, and if there was any abuse of power (Matter, 2011). The second requirement is that the oppressor intended to prostitute, sexually exploit force into labor or servitude, or remove organs from the victim (Matter, 2011). Children are not required to provide evidence or proof of being threatened, defrauded, deceived, abducted, or in a position of vulnerability (Walk Free Foundation, 2013 Index). *Forced Labor* occurs when an individual is forced into physical labor, an intensive work or service condition by the threat of harming the individual or individuals loved ones. This is closely related to debt bondage (Walk Free Foundation, 2013 Index). Victims can be abused with multiple crimes that are defined as modern slavery. The goal of this research is to scrutinize the correlation of colonialism and imperialism with modern slavery, based on the definitions provided above. Any nations that were never colonizers, imperializers, or had never been colonized or imperialized were not included in the database.

Methods

Three main websites were used as the essential resources to calculate the slavery rate. The three databases are the United Nations Statistics Divisions, CIA: The World Fact Book, and The Global Index 2013.

The United Nations Statistics Divisions website has a list of all nations, and each nation has been placed into regional areas that are located within their continent. For example, Ghana, Liberia and Togo are all African countries in the specific western region of Africa. *CIA: The World Fact Book* lists all the nations' dates of independence. The dates provided do not necessarily reflect the exact state of independence, but rather, include some significant acts of nationhood such as unification federation, confederation, establishment, fundamental change in the form of government, or state succession. For example, Tanzania's independence date is December 9, 1961 but it includes the unification of Tanganyika and Zanzibar to create Tanzania in April 26, 1964. The date that is recognizable for the purpose of this research is December 9, 1961, when Tanzania received independence from the UK. For another example, the recognized date of independence year for Cuba is 1898 when it gained independence from Spain instead of 1902, the year the United States recognized Cuba as independent (Central Intelligence Agency).

The records in the Global Slavery Index of 2013 were used to calculate the slavery rate. Appendix 2 of The Global Slavery Index of 2013 contains each nation's population and calculated number of people that are enslaved. These were used to calculate the slavery rate for each nation. To calculate the slavery rate, the overall population of each nation divided the number of enslaved persons. The nations that were not in The Global Slavery Index 2013 were eliminated due to the inability to calculate the slavery rate. The Global Slavery Index 2013 research was done by the Walk Free Foundation of 162 countries, which means there were many countries that were not included in the research. Since modern slavery is a concealed crime that takes various forms, it is a difficult to measure. There are two methods that permitted the Walk Free Foundation to conduct their research. The first method was review of any public records, which indicate a secondary source report apart from government, such as investigations by non-governmental organizations (NGOs), international organizations, and journalistic reports across all forms of media. The second method was to consult with experts with specialized information about the country, region, or commerce. In every nation that they conducted their research in, they made sure the secondary sources data were not over or under stated. All the research was collated and these three elements are reflected in the index: the Estimated prevalence of modern slavery in each country (this makes up the majority of the Index measure, accounting for 95% of the total); a measure of the level of human trafficking to and from each country, (accounts for 2.5%); and a measure of the level of childhood and early marriage in each country.¹

The facts in the Global Slavery Index originate from a number of reliable but

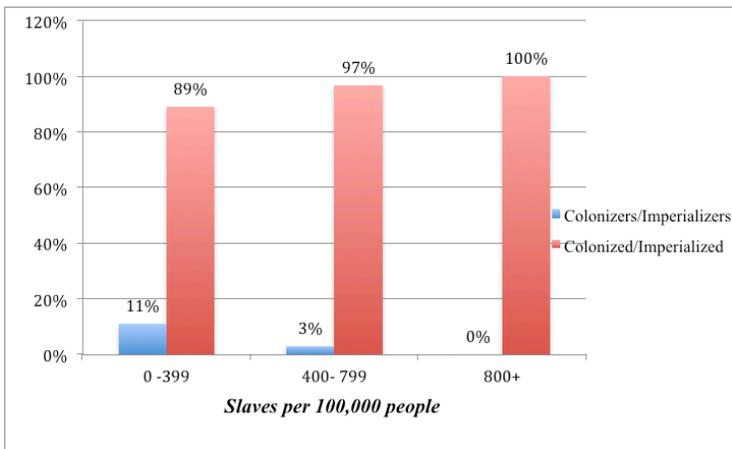
1 For further details on each of the elements, see index 2 of The Global Slavery Index 2013.

still incongruent sources. Some of the variables were difficult to compare. The technique used to overcome this problem was to create a standard linear scale to link all the information, from a minimum of 1 to a maximum of 100. They retain a normalization process created based on the formula: $y = I + (x-A)*(100-I)/(B-A)$. The goal for normalization process was to construct a direct transformation of all variables used in the Global Slavery Index where all the relations were candid. In this paper, as stated above, The Global Slavery Index 2013 was used to calculate the slavery rate by dividing the calculated number of enslavement with the population. The slavery rates were all rounded to the nearest 100,000 and used scale of one slave per 100,000 people for each nation; the entire research is composed of 115 nations (Walk Free Foundation, 2013 Index).

Challenges

National Statistics Divisions: a limitation with using this was that all the nations in this website are members of the United Nations (UN); this means that countries that are not members of the UN would not have been included in this database CIA: The World Fact book did not have independence dates for all nations, especially those who are currently territories of other nation such as Puerto Rico or Christmas Island. Another challenge the listed independence date might be different from the date some nation celebrate their independence. A third challenge was that any sovereignty state that was not included in the Global Slavery Index was also not included in this research as well. The result of this research was based on available information that was gathered from these three resources.

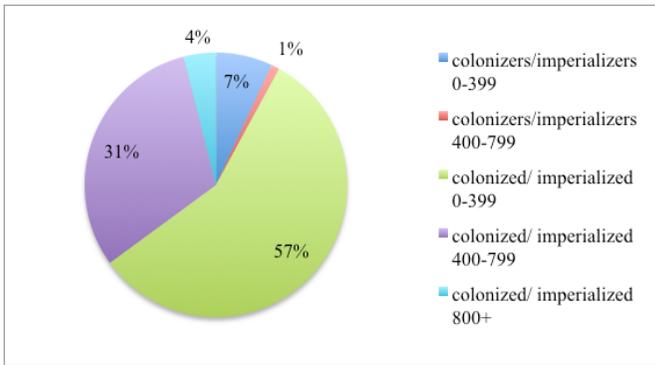
Result



*See Table 1: The frequency table in the appendix to see how the graph was calculated.

Figure 1: The bar graph illustrates that as the slavery rates increase, the colonized and imperialized nations' percentage of modern slavery increases while colonizer and imperializer nations' percentage continues to decrease.

Colonialism, Imperialism and Modern Slavery



* See Table 1: The frequency table in the appendix to see how the graph was calculated

Figure 2: The pie chart consists of combined data of slavery rates for all the 115 nations. With the combined data, the pie chart demonstrates that the colonizers and imperializers has the lowest percentages of 8%, while colonized and imperialized has the highest percentage of 92%.

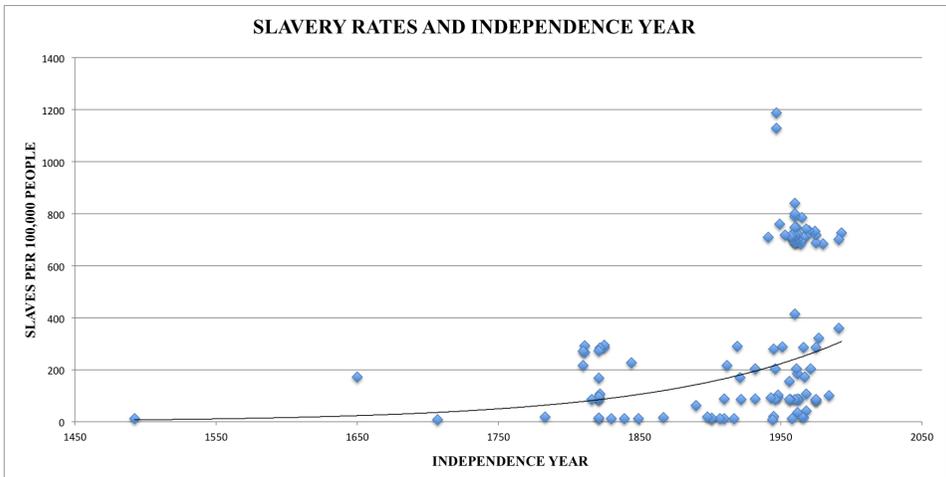


Figure 3: The exponential graph shows the earlier the nation become independent the lower the modern slavery in that nation, compared to the nations that gained nationhood later. The graph excluded two nations for being outliers of 2,056 and 3,987 out of slaves per 100,000 people modern slavery.

Discussion

The Imperialism and Colonialism period occurred when European nations invaded foreign territories all across the globe (Stuchtey, 2011). The invasions were a competition for resources among the European nations, since resources signified power (Stuchtey, 2011). The more territories a nation conquered, the more access they had to the resources, making them more powerful. The colonizing and imperializing nations justified the invasion of other lands by through dehumanizing the natives, often referring to them in zoological terms, and declaring that they had a responsibility to demonstrate civilized values and morals because the natives lacked these (Fanon, 1963). Due to the dehumanization of indigenous peoples, a great deal of suffering occurred within native communities because individuals quickly became victims of slavery, and families were separated forever when loved ones were trafficked out of their home countries. As the competition between the colonial and imperial powers increased, the creation of new boundary lands became a tactic to avoid wars among one another (Stuchtey, 2011). While these creations of nations boundary created peace among the colonial and imperial power nations, it caused more conflict among native people because they were often forced to work with tribes with whom they had unfriendly relations (Fanon, 1963). This also created a fragment in the ruling structure, which the natives had before the invasion of the European nations (Iweriebor, 2011).

Many of the colonizing and imperializing nations had powerful military presences during the invasion of these lands (Fanon, 1963). This ensured that natives were defeated and discouraged from further rebellion against the foreign nation and helped them stay in obedience of the foreign laws (Fanon, 1963). This created a clear inequality in life style between the foreigners and indigenous people, which could be seen in the colonizing and imperializing people having better living quarters, food supply, and all the essential basic needs, etc. (Fanon, 1963). This was in contrast to neighborhoods where the native colonized people were dying of starvation, a lack of clean water, and disease (Fanon, 1963). This inequity was a major unifying factor for the natives to rebel against the colonial and imperial laws that were being forced upon them (Fanon, 1963). Some nations successfully earned their independence, but for those unable to, the oppression continued, and even worsened (Fanon, 1963). An example of this occurred in South Africa before and during the period of apartheid. After the Second World War, the United States and twenty-six other supporting nations created the United Nation (UN), a term invented by Franklin D. Roosevelt in 1945 (United Nations, "Histoire, ONU, Nations Unies, Charte, Chronologie."). The goal of the UN was to maintain international peace and ensure that "the powerful nations" (or the nations that had colonial and imperial power) did not cause a third world war (United Nations, "Histoire, ONU, Nations Unies, Charte, Chronologie.").

The data collected for this research revealed that there were about 67 out of 115 nations that gained their independence within the time frame of 1945 to 1991, during which the Cold War occurred. The developed nations (colonizing

Colonialism, Imperialism and Modern Slavery

and imperializing) held high expectations for the recently decolonized and independent nations to be able to contribute immediately to the global economy. But recently decolonized and independent nations were unable to partake in to the global economy because the nations had to prioritize to solving other problems such as hunger, poverty and other similar issues in their own countries first (Fanon, 1963). These troubles such as hunger and poverty were created during the colonial and imperial period, and these problems did not disappear once a nation became independent; instead, it created a stark separation between the developing and the developed nations (Fanon, 1963). Often, the many reasons why practices of modern slavery are still occurring are because rooted in other forms of colonial and imperial oppression (Fanon, 1963).

The result of this research confirms both of the hypotheses to be true. The first hypothesis stated that the colonized and imperialized nations will have higher slavery rates than colonizing and imperializing nations, and this is demonstrated in Figure 1. Figure 1 has a bar graph that shows as the modern slavery rate continued to increase the bar of the colonized and imperialized would increase and reach 100% at 800+. This is compared to colonizing and imperializing nations, where the opposite occurred: as the modern slavery rates increased the bar decrease to 0% at 800+. Figure 2, the pie chart, shows that out of 115 nations involved in the research, collectively the colonized and imperialized nations have higher modern slavery rate than colonizing and imperializing nations. The second hypothesis was that nations that have had their independence longer would have lower rates of slavery than nations that have more recently gained their independence. The exponential graph in Figure 3 shows slavery rates increase the later that states gain independence. This is possibly because nations that have had their independence longer have had more time to establish and strengthen their governments' structure, creating access to various resources that are unavailable to developing nations, which have not had as much time to establish suitable governments. These limitations of developing nations create distinct different levels between developed and developing nations and should be considered by the UN when creating standard international laws.

International laws are standardized laws, often set by the UN, for sovereign states and are often used as guidelines to create suitable laws for each nation (Fraley, 2008). Developed nations have been able to create and better enforce such laws than developing nations. Often, many victims of human trafficking are trafficked from developing nations to developed nations based on false promises of job opportunities (Matter, 2011). An example of resources is the United States providing aid to the victims of human trafficking with T-visa, which provides full access of resources to victims and guaranteed protection to the victim family overseas (Tiefenbrun, 2005). This is in contrast to Mali, where a local organization that rescues children at the border from being labor trafficked in the cocoa farms located in the Ivory Coast simply returns them home. By returning the victim(s) to the same environment where they still have the social problems, such as poverty, which made them a target for modern slavery actives in the first place without

change of improvement, does little to help. Eventually the individual is forced by social and environmental issues to go back in to the same abusive situation (McCormick, 2006).

Many national leaders claim to have laws against the activities of modern slavery, but lack the ability to enforce the laws, which makes the laws not beneficial to the citizens (The Dark Side of Chocolate, Danish Broadcasting Corporation, 2010). As stated above the crimes of modern slavery are the result of other problems of social injustice. Fostering collaboration between organizations that are already dedicated themselves to alleviating the existing social injustices would be a possible solution to help increase individual security and reduce the rate of modern slavery in developing nations. For example, a human trafficking organization, working with an environmental organization would help educate the natives in rural communities to re-create sustainable forms of agriculture for families to depend on, with the hope of preventing people from becoming an easy target for modern slavery. This is would also be beneficial for the UN to compile accurate and accessible data on how many individuals are victims of modern slavery and allow them to have supportive resources.

Conclusion

The historical connection between modern slavery and the era of colonialism and imperialism has been demonstrated here. The more territory a nation conquered, the more access it had to the brutal rewards of free labor from the natives and increased access to resources from the land. One of the possible consequences of these crude tactics may have been in the colonized and imperialized nations having a higher rate of modern slavery than the colonizing and imperializing nations.

Creating international and national laws does not fully eradicate the issue. Instead the UN needs to consider this problem and provide an advocacy to help work with governments and organizations dedicated to the eradication of the social injustices that cause modern slavery to occur. The organizations can educate about how certain cultural practices are harmful, not only to certain target groups, but also to the welfare of their community. Doing this would empower people to help create sustainable environments where they are once again dependent on each other and not dependent on outside aid. The most important solution is to always empower the locals, who understand the culture and the circumstances of their communities, rather than foreigners imposing their own interpretation of the situation on the native community. Having international and national laws is important, but we also need the local community to design the methods of how the laws are going to slowly eradicate modern slavery in developing nations.

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Appendix

Slavery Rates (<i>slaves per 100,000 people</i>)	Colonizers/ Imperializes	Colonized / Imperialized	Total
0-399 Number of countries Percentages of the row Percentage of 115 countries	8 11% 7%	65 89% 57%	73
400- 799 Number of countries Percentages of the row Percentage of 115 countries	1 3% 1%	35 97% 31%	36
800+ Number of countries Percentages of the row Percentage of 115 countries	0 0% 0%	6 100% 4%	6
TOTAL			115

Assessing Competitive Behavior in Captive-Raised Western Pond Turtles

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Research Mentor: Nick Geist, Ph.D.

Abstract

Western pond turtles (*Emys marmorata*) in a captive head-starting facility at the Oakland Zoo were observed in multiple pairwise competitive feeding interaction tests to evaluate and establish dominance hierarchies. Each turtle was paired against the others in multiple independent tests of food obtaining dominance and level of aggressive behavior. We tested all possible pairs to establish a summary of dominance hierarchy with 6 runs for a total of 42 tests each. Each turtle showed relatively stable behavior patterns in these competitive interactions over time based on a dominant-subordinate matrix. This method can be applied to best practices in conservation-based head-starting protocols for *E. marmorata* and potentially other species in similar programs.

Introduction

The Western Pond Turtle (*Emys marmorata*) is the only native aquatic turtle species along the Pacific Slope of the West Coast of Northern America (Buskirk, 2002). Because of a number of factors (e.g., habitat loss/disturbances, introduction of non-native species, etc.), *E. marmorata* populations are in decline in many portions of their historical range (Spinks et al., 2003). This has resulted in the species being listed as Species of Special Concern by the California Department of Fish and Wildlife (CA DFW). The Sonoma State University (SSU) Biology Department, in collaboration with the Oakland and San Francisco zoos, has one of only two head-start conservation-based programs for *E. marmorata* approved by the CA DFW. These efforts, which include the captive raising of hatchling turtles in controlled environments, are important for the long-term success of species survival and reintroduction by providing data about many poorly understood aspects of *E. marmorata* biology, behavior, and phenotype.

An important aspect of this head-starting program is establishing and assessing protocols for producing the most fit and healthy turtles for re-release into the wild. Pair-wise competitive behavior tests are one method that has been applied for assessing fitness index in juvenile turtles, with competitive behavior studies performed on several turtle species, e.g., snapping turtles (*Chelydra serpentina*), box turtles (*Terrapene carolina*) (Froese, A. D., 1974; Boice, R., 1974), but there have not been any such studies on *E. marmorata*. Assessing the fitness index through conducting competitive behavior tests with *E. marmorata* juveniles

is relevant to head start conservation-based programs as it may potentially provide critical data informative to conservation-based programs that house these captive raised turtles in cohorts. The program currently maintains these turtles based on size, but our data demonstrates that grouping the juveniles into cohorts based on competitiveness may be a more appropriate method. Individual turtles of approximately the same size may not be getting enough food because they are less competitive than other juveniles that they are grouped with based exclusively on size. In this case, it might be a better practice to segregate the juveniles by a hierarchy based on competitiveness. On the other hand, our data might show that *E. marmorata* is a species that isn't as aggressive as some other species such as snapping turtles of the American Southeast and that researchers may need to take other variables into consideration.

Methods

Individual *E. marmorata* were tested for competitive feeding behavior from July 2014 to November 2014, twice a month with at least one week between tests. Due to the availability of the zoo's staff, some dates were rescheduled. Seven juvenile turtles were selected to participate in pair-wise competitive tests, and the same 7 individuals remained paired throughout the entire testing period. The selected individuals were fasted two days prior to the testing date (e.g., fasted on a Friday if testing date is Sunday). Each turtle was paired with all others in the cohort for a total of six competitions per test, and each test had a total of 21 pairs. Time of day [morning] and tank/water temperature of 74-80°F were kept constant.

Each pair was placed in a plastic tub filled with water and plastic vegetation to control environmental temperature and noise, and to minimize disturbance to the turtles by the observer (Steyermark et al., 2001). Because this species is easily disturbed by human activities, we covered the glass aquarium with black plastic to prevent any light from entering the tank from the sides. The aquarium was filled with 4 liters of water and divided into three different compartments—2 equal-sized lanes for the turtle pairs and a single open area where food was presented. The aquarium was slightly tilted (~2-3 degrees) to allow both dry and wet environmental conditions. The 2 turtles were then placed into the side-by-side compartments, so that they were visually isolated from each other by a plexiglass partition. Another clear perforated glass partition was also put in place to separate both turtles from the food compartment, but allow them to see and smell the food item. Fluorescent ceiling lights supplemented natural light through the top of the tank. We also used a mirror at the corner of the tank, angled in such away where the observer was able to observe the activities within the tank without exposing his or her presence to the turtles. Each pair was allowed about 20 seconds to get used to the tank environment before the competitive observation began.

Observation and stopwatch timing began immediately once the approximately 0.50g pinky mouse (a preferred food item) was placed in the center of the food compartment and the glass partition between the turtles and the food compart-

Pond Turtles

ment was lifted. The turtle that got to the food first and bit into it was scored as the winner, and the other one was scored as the loser. Other aggressive and abnormal behaviors were also recorded in the comments. After all the pairs completed their test, mass of each turtle was recorded for each testing dates. The turtles resumed their regular diet in the zoo's head-starting facility until the next testing date when fasting resumed.

Results

The results from feeding competition experiments are depicted in Table 1.

Dates	7/20/14		8/3/14		8/17/14		9/14/14		9/28/14		10/12/14	
Turtle ID	Win	Lost	Win	Lost	Win	Lost	Win	Lost	Win	Lost	Win	Lost
422	4	2	1	5	1	5	3	3	2	4	4	2
441	2	4	2	4	2	4	0	6	1	5	3	3
434	4	2	3	3	6	0	4	2	3	3	6	0
430	2	4	4	2	2	4	5	1	5	1	1	5
420	2	4	2	4	4	2	3	3	4	2	2	4
438	5	1	6	0	3	3	3	3	4	2	2	4
432	2	4	3	3	3	3	3	3	4	2	3	3

Table 1. Each turtle's wins and losses were recorded daily for each of the six testing dates. Dominance hierarchies were constructed, and individual turtles were assigned daily ranks as winner or loser, on the basis of a dominant-subordinate matrix. Most changes in dominance rank occurred during the first several trials of the study.

We determined the hierarchy based on the total number of "wins" divided by total "losses" to rank each turtle in terms of competitive behavior. The results are shown in Table 2. This ranking system for dominance hierarchies was based on an existing study for another turtle species (Froese, 1974). Turtle mass, the duration taken for the turtle to bite onto the food, and other aggressive and abnormal behaviors were recorded, but these factors were omitted from the data analysis since there was not enough information to conclude if these factors show any significant results.

Turtle ID	Total Wins	Total Losses	Ratios	Ranks
422	31	11	2.82	1
441	26	16	1.63	2
434	21	21	1	3
430	22	20	1.1	4
420	19	23	0.83	5*
438	19	23	0.83	5*
432	11	31	0.53	6

*turtles that are tied.

Table 2. Final Ranking Summary. Summary of all total wins and losses for each turtles throughout the testing period. Each turtles was ranked base on the ratios of total wins divided by total losses.

Discussion

Our results show that *E. marmorata* juveniles kept in captive head-starting facilities demonstrate dominance hierarchies in terms of their feeding behavior. This information is important because it allows keepers in programs to separate turtles based on dominance to maximize nutritional success of all captive raised turtles. It provides information on a basic aspect of *E. marmorata* behavior previously unknown. It also establishes protocols that can be applied to this and other comparable western pond turtle head-starting programs, and potentially may be applied to similar projects with other turtle species.

In summary: turtles, are suffering global declines with ~2/3 of species in serious to moderate decline (Tortoise & Freshwater Turtle Specialist Group, 1996.). *E. marmorata* has recently been named as a SAFE (“Saving Species from Extinction”) species by the international Association of Zoos and Aquariums (AZA), thus it will receive increased attention from conservation agencies, biologists, and media. This study is part of a collaborative effort between Sonoma State University and the Conservation Departments of the Oakland and San Francisco zoos and is likely to expand to include several other organizations in the near future. We hope that a concerted program of basic research and applied conservation can be an effective model of conservation for not only *E. marmorata* but a range of other turtle and reptilian species on a world-wide basis and that our research contributes to increasing the effectiveness of such programs.

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The Role of State Ideology in the Palestinian-Israeli Relationship

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Abstract

This research explores the relationship between the Israeli state ideology and its effects on the relationship between Israeli-Jews and Palestinians living in Israel. While there are many different angles and positions from which to observe this complex relationship, this research will hone in on the experience of the Palestinian minority. By creating a framework based off research done by As'ad Ghanem of the University of Haifa, this research seeks to identify ways in which Israeli state ideology influences treatment of the Palestinian minority and asks if it also influences the Israeli-Jew population's attitudes towards the minority. This paper will explore the power of ideology by focusing on the elements that all ideologies, including Zionism, have in common. This foundation will then allow the research to proceed with making connections between the state ideology of Israel, Zionism, and discriminatory actions made by the state, drawing from previous literature and following the Ghanem framework. This research theorizes that Israeli state ideology, identified as Zionism, maintains and incites the discrimination of Palestinians in Israel.

Literature Review

In the conclusion of *Jewish State*, Herzl notes that in creating a Jewish homeland, “we ought not to create new distinctions between people; we ought not to raise fresh barriers, we should rather make the old disappear” (Herzl, 1896). The historical context given, in conjunction with recent research done by Ghanem, suggests that the execution of the formation of the State of Israel may not have run very closely to Herzl's idea of Zionism. This research argues that the Zionist ideology of Israel is the common denominator when it comes to discriminatory actions towards the Palestinian minority by the state and its Israeli-Jew majority. After discussing ideologies and ways in which they can sanction and maintain discrimination through execution by the state, it will examine how the Zionist ideology specifically comes into play in inciting discrimination against the Palestinian minority in Israel by the state and the Israeli-Jew majority. Then, it will contend that this discrimination happens on three distinct levels identified by Ghanem and go on to provide examples that are characteristic of each.

Zionism itself is regarded as a political ideology as well as a movement (Hermann, 2013). This movement, “a mantle claimed by a diverse array of Jews”

State Ideology

(Hermann, 2013) was the base of and ultimately led to the creation of Israel and its standing as a Jewish state. In *The Origins of Totalitarianism*, Hannah Arendt explains that ideologies are known for their scientific character in that they “combine the scientific approach with results of philosophical relevance and pretend to be scientific philosophy.” Herzl’s Zionist ideology falls close to, if not in line with, this method when he says that the Jewish migration to a national home “must proceed in accordance with scientific principles.” However, Arendt goes on to argue that ideology is a mere “pseudo-science;” ideology in its purest form is nothing more than the logic of an idea and the ability to apply historical context to it, implying that an idea cannot be a science simply by virtue of adding the suffix *-logy* (Arendt, 1966). In the case of Herzl’s *Jewish State*, the idea is that of the creation of a Jewish state, which is justified and applied using the historical context of thousands of years of persecution and anti-Semitism, thus the Zionist ideology.

So where, if any, is the power in any given ideology? While ideologies may seem benign, Arendt makes the argument that in fact all ideologies contain three particular totalitarian elements. It is imperative to note that this research is in *no way* suggesting that Israel is a totalitarian state. Rather, by using Arendt’s literature, it seeks to shed light on the aspects of Zionism that are also indicative of totalitarian rule so as to show that an ideology, like totalitarian governments, can assert power and influence over a collective of citizens.

Arendt points out that the nature of ideologies is revealed in the role they play in the “apparatus of totalitarian domination” (Arendt, 1966). As will be further discussed, this research argues that Zionism is well integrated, arguably omniscient, in Israeli government institutions and legislation on the three levels of discrimination. This particular ideology exercises totalitarian-*esque* domination, which has negative impacts over the minority, through the Zionist ideology. Arendt’s first element of totalitarianism that is peculiar to ideological thinking asserts that, “Ideologies have the tendency to explain not what is, but what becomes” (Arendt, 1966). This first element is reflected after referring to *Jewish State*, where Herzl highlights that while Jews may naturally move to countries where they are not persecuted, their very presence in a country that has not persecuted them before, incites it (Herzl, 1896). He adds that this will continue to be the case until a political solution is found because there is no “...hope for a change in the current of feeling” (Herzl, 1896). In essence, Herzl seems to be arguing that if there is no designated ‘safe haven’ for the world Jewry, then the only outcome in the long-run would be a significant dwindle in population, if not complete eradication. Secondly, Arendt states that, “ideological thinking becomes independent of all experiences from which it cannot learn anything new” (Arendt, 1966). This element is echoed in Herzl’s pamphlet when he describes the Jewish context, where more powerful Christian always nations exist, explaining that ‘might precedes right’ and “for an indefinite period will probably remain” (Herzl, 1896). In describing the hardships suffered by world Jewry, it seems as though Herzl comes to the conclusion that the idea that ‘might precedes right’ will continue to rationalize worldwide

anti-Semitism. Herzl's solution is to enlighten Jews with a new perspective and delineate the importance of adopting a Zionist approach from there on out. Arendt's last element indicates that given the absence of power to transform reality, ideologies reach "emancipation of thought from experience through certain methods of demonstration" (Arendt, 1966). To clarify, this last element means to say that since ideological thinking begins with an "axiomatically accepted premise... it proceeds with a consistency that exists nowhere in the realm of reality" (Arendt, 1966). In fact, if we take this into account, it could be argued that the entirety of *Jewish State* is irrelevant by virtue of going into meticulous detail on the structure, organization, establishment and institutions of a Jewish state which, at the time, was nothing more than an idea and existed nowhere in reality. It seems as though Herzl is well aware of the limits of his own Zionist ideology when he concedes that "touching upon the legal basis" of the creation of the Jewish state, he has exceeded the limits of rationality (Herzl, 1896). In sum, by applying Arendt's three totalitarian elements of ideological thinking to the Zionist ideology, there can later be a connection drawn between the actions carried out by the State of Israel in their Zionist traditions and the subsequent treatment of the Palestinian minority.

Apart from its negative influence on the minority, the Zionist ideology may also be what feeds strong Israeli-Jew support for a Jewish nature of Israel. The findings of Israeli sociologist Sammy Smootha explain that Israeli Jew support for the ethnic-Jewish nature of Israel stems from five specific attitudes towards the Palestinian minority that maintain the status quo:

- 1) the Arabs constitute a hostile minority which has to be watched;
- 2) the Arabs should be grateful for the progress they have enjoyed since 1948;
- 3) Israel is the state of the Jewish people...Arabs should be content with limited individual rights...;
- 4) the Arabs constitute a new minority with no connection to the Palestinian people;
- 5) the Arabs have to accept the fact of their being outside the power and decision-making junctions in the state (Smootha, 1994).

As'ad Ghanem, researcher at the Institute for Peace Research and Professor of Political Science at the University of Haifa in Israel, shares that "The Palestinians in Israel, as citizens and as a minority group, want to attain equality with the majority Jewish Group" (Ghanem, 2002). This raises the question, if the State of Israel is as fair and just to its minority as is widely claimed by the Declaration of Independence and official statements, why would the Palestinians feel the need to be more equal? As this research has argued so far, Zionist ideology is a common denominator in explaining the unfair treatment that has been cited by Palestinians for decades. Ghanem suggests that, "Israel as a state and political system preserves the superiority of the Jews" over the Palestinian minority (Ghanem, 2000). He goes on to describe that this preservation of superiority and subsequent discrimination happens on three levels: 1) Ideological and declarative level, 2) Structural level, and 3) Executive and policy level (Ghanem, 2000).

State Ideology

Prime Minister David Ben-Gurion was the first to sign the Israeli Proclamation of Independence, which stated “This right is the natural right of the Jewish people to be masters of their own fate, like all other nations, in their own sovereign state” (“Declaration,” 1948). The Jewish and democratic State of Israel was officially declared on May 14th, 1948, and is celebrated annually by Jewish Israelis as the Day of Independence, or *Yom Ha’atzmaut*, while grieved by Palestinians as the Catastrophe, or *an-Naqba* (Tyler, 2011). The mission and goals outlined in Israel’s Declaration of Independence are an example of the first way in which Israel maintains superiority of Jews, which Ghanem identifies as the ideological and declarative level. Ghanem argues that since Israel was founded by Jewish people, it has a “Jewish-Zionist nature; its objectives, symbols and policies are built on the fact that it is a state of the Jewish people” (Ghanem, 2000). On the ideological declarative level, Israel has declared itself a Jewish and democratic state, but it is worth pointing out that the latter description may not be true to the definition in this case.

Furthermore, in 1985, the Knesset, Israel’s governing body, added Amendment 7A to their Basic Law, stating that “A candidates’ list shall not participate in elections to the Knesset, and a person shall not be a candidate for election to the Knesset” if they express a, “negation of the existence of the State of Israel as a Jewish and democratic state” (“Basic Law,” 2015). Though this does not explicitly exclude Palestinians from running for office, the “democratic” part is misleading. While Israeli-Jews may claim tolerance and fair treatment of the Palestinian minority, which makes up about twenty percent of the total Israeli population (“Statistical Abstract”, 2010), the status of the Palestinian minority remains inferior in light of the overwhelmingly Jewish traditions that dominate the national sphere. This sentiment is supplemented by the findings of Ibrahim Makkawi, Professor of Education and Psychology at Birzeit University. Makkawi points out that Israelis’ terms for the minority are defined only in relation to the Jewish majority, and terms such as “Israeli-Arabs”, and the most often used in official Israeli statements, “non-Jews”, are a surreptitious way of keeping Palestinians from identifying with their heritage (Makkawi, 2008). Since Israel is a Jewish state, and was declared as such by Ben-Gurion, the Proclamation of Independence, and by virtue of the goals of Zionism, this puts Palestinians in Israel at a consistent, regulated disadvantage.

Next, Ghanem identifies a structural level of exclusion of the Palestinian minority, which means to say their lack of inclusion in Israeli institutions composed mostly of the Jewish majority. This is found via Palestinian exclusion from, “centres [sic] of political decision making, their non-induction into the army, the non-employment of Palestinians in senior positions...[and] the structure of Arab education” (Ghanem, 2000). By examining the Israeli-Jew perception of threat and two particular Israeli laws, characteristics of Palestinian structural exclusion become clear.

Anthropologist Rebeca Raijam of the University of Haifa examines the way membership for Palestinians is influenced by Israeli Jews perception of competitive threat for employment. The threat can be against individuals or groups, actual or perceived, and “individuals holding vulnerable positions in the labour

[sic] market adopt negative attitudes to...out-group populations because they feel threatened by their presence,” concluding that the perception of threat rationalizes the exclusion of minorities (Raijman, 2010). In a survey of 800 Israeli-Jewish respondents, Raijman found that, “the stronger the perception of socio-economic threat and the support for national and cultural homogeneity, the stronger the support for exclusionary attitudes to members of the out-group population” (Raijman, 2010). The author concludes by relating this data to the likelihood of the threatened group granting social rights to an out-group. Citing Marilyn Hoskin, the author notes that, “Public opinion towards the allocation of social rights to immigrants and ethnic minorities” is important because it is indicative of whether the minority is wanted or feared, adding “public sentiments may be contagious, spread to others and be accepted as fact, thereby influencing government policies” (Hoskin, 1991). This may be further supported by the previously mentioned study done by Burstein, identifying public opinion as an influential factor of changes in public policy.

Sociologist Gershon Shafir of UC San Diego and Political Scientist Yoav Peled of Tel Aviv University argue that, “The true nature of a community is revealed as much by who has been denied full membership in it as by who has been wholeheartedly included” (Shafir, 2002). This bodes well with Ghanem’s third and final pillar, which identifies an executive and policy level of Palestinian exclusion. This includes any way in which Palestinians are kept from “being treated as equal citizens,” such as discrimination in legislation or allocation of budgets or land (Ghanem, 2000). To demonstrate this level of exclusion, this research will investigate the institution responsible for the allocation of land, distribution of funding for the poor, and the contentious Law of Return.

In regards to the unfair distribution of land, Ghanem points out that the “vast majority of the lands belonging to Arab citizens have been expropriated” (Ghanem, 2000) since the founding of the Jewish state. On Independence Day 1948, Jews had only managed to acquire 5.8% of the land in Palestine (Pappe, 2006), but more land would inevitably be taken in the following years. The reallocation of land was been carried out by The Israel Land Authority (ILA), which controls 93% of the land in Israel (Israel Land Authority, 2013), and carries out the enforcement and management of the two laws regarding land in Israel, the Israel-Lands Law of 1960 and the Israel Lands Administration Law (Molavi, 2009). The ILA was founded to adhere to the goal of “purchasing and developing land as a national resource of the Jewish people, by the Jewish people, for the Jewish people” (“Ruling Palestine”, 2005). In asserting three times that the clients are “Jewish people”, the ILA establishes clear preference for Israeli-Jews in their mission. By overtly favoring the Israeli-Jewish majority and by virtue of not mentioning the existence of a minority or any other group, the ILA is deliberately excluding the Palestinian minorities right to land.

The State of Israel offers a host of special rights and privileges to the Jewish majority. As a state founded on Zionism and Jewish culture and heritage, Israel has done a phenomenal job of ensuring that the blow of discrimination historically

State Ideology

felt by Jewry worldwide. Through persecution and anti-Semitism, can be softer within its parameters. This is done on the ideological and declarative, structural, and executive and policy levels, all of which result in double-edged swords for the Palestinian minority. Israel grants its Palestinian citizens suffrage, freedom of expression, movement and association, but still “safeguards Jewish primacy in all spheres” (Ghanem, 2000), leaving them with little hope to break the glass ceiling they have grown accustomed to living under. Ghanem summarizes, “Israel preserves the inferiority of the Arabs vis-à-vis the Jews while discriminating against the former. . . in order to preserve the status quo and prevent the Arabs from achieving equality” (Ghanem, 2000).

Methodology

This qualitative research has a heavy focus on textual analysis, supplemented by quantitative data, to test its hypothesis. Quantitative data was concise, collecting from the years 2010, 2012, and 2014 to reflect current attitudes.

Primary source data was collected from *Israel Statistical Abstracts* provided by Israel Central Bureau of Statistics (CBS), an independent research body led by the Israeli Government Statistician, economist Shlomo Yitzhaki of Hebrew University. The CBS has conducted yearly *Israel Statistical Abstracts* since 1949 and are based off information collected via surveys, one-on-one interviews, and census data.

Primary source data was also collected from the Israel Democracy Institute’s *Israel Democracy Index*. The Institute is an independent think tank “dedicated to strengthening the foundations of Israeli democracy,” (“About IDI”) and conducts the *Israel Democracy Index* through The Guttman Center for Surveys, “the largest, most comprehensive database on public opinion surveys in Israel” (“Israeli Public Opinion”). In 2010, the sample size was 1,200 with 85% Jewish respondents and 15% Arab respondents (Arian, 2000). In 2012, the sample size was 1,025 with 82.8% Jewish respondents and 17.2% Arab respondents (Hermann, 2012). In 2014, the sample size was 1,007 with 83.6% Jewish respondents and 14.5% Arab respondents (Hermann, 2014). For this research, the questions referenced were those answered by only Jewish respondents.

Since the state of Israel is self-declared Jewish and democratic, this research identifies the first dependent variable as Israeli-Jew preference for the State of Israel to maintain a Jewish nature over a democratic one to be representative of preferring a Zionist nature over a democratic one. To further supplement this variable, a second proxy dependent variable of Israeli ‘trust in government’ was added to exemplify support of the Prime Minister, head of government. The Prime Minister in the years 2010 through 2014 was Benjamin Netanyahu, member of the conservative Likud party, which is historically known for opposition to Palestinian statehood. This data was collected from the 2010, 2012, and 2014 Israeli Democracy Indexes provided by the Israel Democracy Institute. The independent variables were categorized into ideological declarative, structural, and executive

policy to correlate with the literature. The first independent variable, the “ideological declarative” variable, is whether Israeli-Jews feel that a Jewish majority should be required for decisions fateful to the country. This data was collected from the 2010, 2012, and 2014 Israeli Democracy Indexes provided by the Israel Democracy Institute. The second independent variable, the “structural” variable, is the rate of unemployment among the Palestinian minority. This data was collected from the 2010, 2012, and 2014 Statistical Abstracts of Israel Civilian Labour Force Characteristics provided by the Israel Central Bureau of Statistics. The third independent variable, the “executive policy” variable, is the budget of the Israel Lands Authority, which is labeled under “Business Enterprises” on the Government Receipts. This data was collected from the 2010, 2012, and 2014 Statistical Abstracts of Israel Government Receipts according to the Ministry of Finance Accountant General provided by the Israel Central Bureau of Statistics.

Findings

The first dependent variable, Israeli-Jew preference for the maintenance of the State of Israel as “Jewish” in nature over “Democratic,” rises 6.5% from 32.4% in 2010 to 38.9% in 2014. The second dependent variable, trust in government, varies significantly over the course of the same timeframe. These changes, and the figures for 2010, 2012 and 2014, are individually observed against each independent variable in the tables below.

Table 1: A Jewish Majority Should be Required for Fateful Decisions

	2010	2012	2014
<i>I.V. I (β_1):</i>	82.9%	77.8%	73.8%
D.V. I	32.4%	34.3%	38.9%
D.V. II	33%	60.3%	37%

Source, Israeli Democracy Index 2010/2012/2014

Table 1 reflects the answers to the statement, “A Jewish majority should be required for decisions fateful to the country,” summarized by Jewish respondents who “Agree” and “Strongly Agree.” The percentage of respondents who agree and strongly agree with this statement decreased between 2010 and 2014 by 9.1%, even though Israeli-Jew respondents have grown more inclined to prefer a “Jewish” nature of state. On the other hand, in observing I.V. I with D.V. II between 2010 and 2012, while support for requiring the majority in fateful decisions declines slightly, support for government almost doubles. The reverse happens between 2014 and 2014, where I.V. I declines slightly but D.V. II falls by 23%.

State Ideology

Table 2: Rate of Unemployment Among Palestinian Population

	2010	2012	2014
<i>I.V. I (β_2):</i>	7.4%	4.8%	7.3%
D.V. I	32.4%	34.3%	38.9%
D.V. II	33%	60.3%	37%

Sources: Israeli Democracy Index 2010/2012/2014, Statistical Abstracts of Israel, Civilian Labour Force Characteristics, Israel Central Bureau of Statistics 2010/2012/2014

Table 2 shows varying rates of unemployment among the Palestinian population. While unemployment falls 2.6% between 2010 and 2012, it rises just as quickly again in 2014. Against the first dependent variable, this data does not sufficiently illustrate a correlation. Run against the second dependent variable, from 2010 to 2014 as I.V. II decreases, support for government increases, indicative of a negative relationship.

Table 3: Budget of the Israel Lands Authority (ILA)

	2010	2012	2014
<i>I.V. I (β_3):</i>	3,800	5,500	6,925
D.V. I	32.4%	34.3%	38.9%
D.V. II	33%	60.3%	37%

Sources: Israeli Democracy Index 2010/2012/2014, Statistical Abstracts of Israel Government Receipts 2010/2012/2014. Budget measure in New Israeli Shekels (NIS).

Table 3 illustrates the rising budget of the Israel Lands Authority. As we can see, the budget of the ILA rose by 30.9%, 1,700 NIS, between 2010 and 2012 and again by a smaller 20.6%, 1,425 NIS, between 2012 and 2014. Nevertheless, between 2010 and 2014, the state of Israel has increased its ILA budget by 45.1%, roughly 781 NIS per year. Though the increases correlate with D.V. I, there seems to be no correlation with D.V. II.

Discussion

Though the first dependent variable, Israeli-Jew preference for a Jewish nature of Israel, is less than a majority at 38.9%, this research considers the statistic significant because it suggests that the issue is controversial and divisive. Furthermore, since the figure has been steadily increasing, this research predicts that the figure will increase in the future and only serve to strengthen the findings. The first dependent variable shows that Israeli-Jews have grown more likely to prefer that the state of Israel maintain a “Jewish” over “Democratic” nature, but it does not necessarily support the hypothesis that Israeli-Jews have become more discrimina-

tory of the Palestinian minority since 2010.

This research presumed that there would be a steady rise in Israeli-Jews who stuck to their Jewish heritage since 2010. However, Table 1 illustrated a decrease in percentage of Israeli-Jew respondents who believe that a Jewish majority should be “required for decisions fateful to the country” since 2010. This data is surprising and seems to run contrary to the data for the first dependent variable, which suggests that Israeli-Jews are developing a stronger identification with the “Jewish” aspect of the Jewish and democratic nature of Israel.

This research also anticipated that unemployment among the Palestinian population would either be on the rise over time or perhaps stay relatively consistent. This was not the case when run against D.V. I, yet when run against D.V. II there is an inverse relationship. This may suggest that Israeli-Jews are more supportive of a government that does not focus on Palestinian unemployment or, more likely, supportive of a government that shows competence in keeping general unemployment rates low. As was mentioned in the literature, a majority that is threatened is more likely to rationalize excluding an out-group, so one could infer that the data suggests a lower level of perceived threat by the Israeli-Jew majority.

Finally, this research assumed that there would be a rise in the Israel Lands Authority budget. As previously discussed, Table 3 shows a 45.1% increase in funds allotted to the ILA by the state of Israel between 2010 and 2014. There was no correlation found with D.V. II, so in light of the relatively inconclusive data from Table 1 and Table 2, this significant difference in budget distinguishes itself from the other independent variables.

Conclusion

Overall, the quantitative findings of this research were mostly inconclusive. In fact, it may be argued that the data found makes the issues discussed even more diluted. While the Israeli public opinion polls and Statistical Abstracts were helpful in that they provided a wide scope of information, the data selected for this research did not sufficiently support the hypothesis.

On the other hand, the qualitative data presented in the literature suggest that there is a significant discrepancy between the rhetoric and treatment of the Israeli-Jew majority towards the Palestinian minority. As evidenced by the literature, the role of state ideology in the Israeli-Palestinian relationship is one that is omniscient, divisive, and yet to be conducive to building an amicable relationship with the minority.

This data hopes to illustrate that the rhetoric used by Israel, which is that of equality for all of its citizens, is overshadowed by the Zionist ideology that underlies Israeli government institutions and legislation. Nevertheless, this research hopes to have been able to add to the conversation surrounding the Israeli-Palestinian conflict.

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Ritual Violence: The Creation of Order and Structure in the North Coast of Peru

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Abstract

This paper focuses on the Sacrifice Ceremony and its context in the role of ritual violence for the Moche civilization in the north coast of Peru. The Moche civilization is composed of different polities apparent through the different stylistic variations in ceramics that showed a common theme of warrior captives, sacrifice, deities and weapon bundles. These themes have come to embody the narrative of the Sacrifice Ceremony, the most prevalent theme of the Moche civilization; its dissemination among the valleys of the coastal region suggests its importance. While Christopher Donnan writes that the narrative of the Sacrifice Ceremony be viewed as a state religion because of its strong unifying force and structured organization, those qualities also apply to the description of power institutions in the north coast. Luis Jamie Castillo Butters writes that the Sacrifice Ceremony reestablishes the social order and perhaps is utilized to create power structures along the coast. Just as the different stylistic variations came to represent different polities, the theme of the Sacrifice Ceremony can represent societal order within the polities and the execution of the ritual then becomes a tool to create power structures along the north coast. The implementation of ritual violence sheds its negative connotations. Instead it represents control, structure and order in the north coast of Peru and the dissemination of the Sacrifice Ceremony a type of representation to create societal order within the polities.

Introduction

The Moche resided in the north coast of Peru from AD 100-800 and managed to create a vast empire that stretches about 550 km from the south of the Nepeña valley to the north of Piura (Quilter, 2010). This culture left us with an array of iconographic images from which to infer the beliefs and practices of the Moche world. Our understanding of these images has evolved from simply viewing them as “secular” images that represented everyday life to images that are “highly charged symbols” that contain underlying messages of politics and religion (Quilter, 2010).

Among those iconographic images, the Sacrifice Ceremony is a preeminent theme of Moche art and carries political and religious messages. Archaeological evidence has confirmed that this ritual took place and was recurrent throughout the north coast. The dissemination of this particular theme throughout the Moche world suggests its importance. The Sacrifice Ceremony is a strong unifying force

and reestablishes the hierarchical structure of the Moche world (Castillo, 2010; Donnan, 2010). In this paper, I seek to identify the Sacrifice Ceremony as a tool of the different polities to create and maintain power structures in the north coast. This study stems from the work of Christopher Donnan and Luis Jaime Castillo Butters (1994) that identified the Sacrifice Ceremony or Presentation Theme as a motif that transcends space and time in the north coast. The identification of this imagery has been noted in ceramics, metalwork and architectural structures. In looking at this image and identifying it as a tool to create power, it is necessary that I speak of the theories surrounding the formation of power in the north coast.

Political Organization

Since the early 20th century, archaeologists have been investigating the formation of political structures in the north coast. The work of Max Uhle, Alfred Kroeber and Rafael Larco began the process of addressing the Moche as a single, centralized state that spread through the use of military power (Castillo and Donnan, 1994). Rafael Larco's Five Phase Ceramic Study (1948) viewed the expansion of ceramic contingent on the cohesive and centralized expansion of political power in the north coast (Castillo & Quilter 2010; Verano 2001, 2010; Quilter 2002).

According to this view, the five phases of ceramic style should be evident throughout all the valleys, but as Luis Jaime Castillo Butters and Jeffrey Quilter state in the article "Many Moche Models," the absence of certain phases from the valleys in the north destabilizes this theory. Christopher Donnan and Luis Jaime Castillo Butters propose that Larco's theory can only apply to the Mochica of the South, but the North territories exhibit a different pattern of ceramic evolution. Investigations conducted in the valleys from Piura to Jequetepeque reveal that Moche phases III and IV are limited, if at all present (Castillo and Donnan, 1994). Donnan and Castillo propose a different method of categorizing Moche ceramics in the northern territories that identifies these valleys connection with the northern Sierra civilizations. Thus there is a case for "the multiple origins" theory that suggests that the Moche rose through the influence of Viru and Salinar; each region and sector developed through independent influences (Castillo & Quilter 2010).

These various political models have one factor in common, the iconography. Although there is continuous discussion over the origins of the Moche civilization, the imagery seems to be the object that transcends space and time. Particularly, the iconography of the Sacrifice Ceremony is among the most diverse and present throughout the valleys in the north coast.

The Sacrifice Ceremony

The images of deities, priests, warriors and sacrifice compose the theme of the "Sacrifice Ceremony," a ritual that culminated in the sacrifice of warrior prisoners (Donnan, 2010; Verano, 2001). Christopher Donnan views the elements

Ritual Violence

of the narrative, the capture of the nude warriors, their sacrifice and their offering to the priest as the basis of the Moche religion (Donnan, 2010). Donnan (2010) attributes the state religion with the ability to create a strong unifying force and structured organizations. Based on Donnan's assertions, the ritual could have been utilized to maintain political power, this however, does not imply that the rituals were conducted under a centralized state power, in fact, my study seeks to name the Sacrifice Ceremony as a common ideology that each valley choose to express in their own manner.

The ritual combat usually took place outside the architectural structures, mountains and desert plants are depicted in the imagery of combat, suggesting that these events were held in the public domain. The warriors are depicted wearing elaborate clothing, ornaments and holding war clubs (Donnan, 2004). The purpose of the battle was to capture and not kill the opponents, who were subsequently stripped of their clothing and paraded with ropes around their necks to the architectural compounds.

The warriors are led to the architectural compounds and presented to the highest Priest. The draining of blood seems to have been the goal of the ceremony. The sacrifice of the victims appears to not have been immediate; investigation revealed that several of the bodies had fractures in the stage of healing, which means that several of these individuals were held for weeks within the architectural compounds before being sacrificed (Verano, 2001). The manner in which these individuals were sacrificed reinstates the hierarchy of the civilization. Some individuals appear to have been buried while others were left in the open for animals to feast on; this perhaps reveals that the individuals that took part in this ritual came from different social classes and thus received different burial treatments (Bourget, 2001).

Ritual or secular warfare

The depiction of warfare in the context of the "Sacrifice Ceremony" is a highly ritualized event. The iconography depicts warrior's fighting a one-on-one combat with the defeated warrior taken as prisoner to be sacrificed (Verano, 2001). The warriors depicted in the ritual combat are both Moche warriors, they are shown wearing similar regalia. This type of representation is the most abundant and limited pieces actually depict warriors from different regions.

The battles involved the use of close range weapons that would not have been used in actual warfare situations; the absence of long range weapons utilized in hunting scenes marks the distinction between a ritual and secular battle (Verano, 2001). The combatants are usually depicted in elaborate dress, wearing metal and feathered headdresses, elaborate tunics, and metal back flaps, which are uncomfortable to wear during actual combat (Verano, 2001). The majority of iconographic images depict this particular form of combat; however this does not mean that the only form of combat was ritualized, but perhaps that only ritualized combat was depicted because of its importance to the political and religious cen-

ters (Jackson, 2010).

Architectural complex

What makes this ritual particularly important is its association with the creation of life in the north coast (Bock, 2003). The north coast is known for its arid climate, but during the month of November the rains come, and the water descends from the mountains. The mountains are the sources of life; the rivers swell and flow down to the coastal valleys (Bock, 2003). The flowing of the rivers represents the beginning of life, which causes the regeneration of nature (Bock, 2003). The rivers that flow down the coastal valleys usually carry murky water that is similar to the blood that falls from the top of the sacrificial structures.

The mountains possess an almost godly presence for the people of the ancient world. The Huacas are often located at the foothills of the mountains or near irrigation currents. The mountains represent the middle ground between life and death (Bock, 2003). The architectural structures mimic the mountain structures and are connected to the veneration of ancestors (Uceda, 2001). Uceda hypothesizes that when priest died, the renovation of the temples would occur; the priest would be buried within the monument, and the ancestral power would be kept within the structure. These structures have often experienced several phases of building, each level covered under a thick layer of adobe brick, marking the emergence of a new power (Uceda, 2001).

The importance of the Huaca structures in the practice of the ritual is evident at the sites of Pampa Grande and Galindo. At these sites the ramped platforms are centers of political and religious rites (Swenson, 2006). The ramped platforms were part of the ritual procession; in Moche iconography the fanged deity is presented the goblet from the ramped complex (Swenson, 2006). As Swenson states, these ramps are often ornamental rather than functional and serve to formalize the movement of the elite figures in the procession of the rituals.

Within these structures, the murals depict images of warriors, priests and sacrifice. Huaca de la Luna in Moche Valley depicts the most vivid imagery of the sacrifice of warriors. The Great Patio imagery depicts the principal deity, Ai-Aepec or “Serpent Demon,” who is associated with blood sacrifices (Jackson, 2008). The other reliefs depict defeated warriors with ropes around their neck being led by the conquering warrior, doubtlessly to their death.

At the site of Huaca Cao Viejo in El Brujo Complex in Chicama valley, similar iconographic imagery is displayed in the walls of this site. The lower plaza showcases the imagery of the Warrior Narrative and a reference to the principal deity (Jackson, 2008). There is a clear reference to a common ideology as the murals depict what appears to be a dance or chant in celebration of the sacrificial processions. The string of images above show anthropomorphic spiders holding tumi knives (ceremonial object) and severed heads (Jackson, 2008). In this site, a femur is placed as part of the relief in the mural, which suggests the spiritual power of the images and the connection of the artist to the ritual practices (Jackson, 2008).

Ritual Violence

This imagery is also displayed at Pañamarca in the far south of Nepeña Valley. The evidence of the same belief system is clear as the murals show the depiction of ritual events, warfare and human sacrifice (Jackson, 2008). A 30 foot long panel reveals scenes of figures engaged in a ritual dance; the individuals are recognized as warriors due to their dress and appear to be engaged in the dance of the chord (Jackson, 2008).

The depiction of religious and political imagery in the murals of these monumental and sacred structures allows for various individuals to have access to this imagery (Jackson, 2008). The depiction of these images in grand enclosures makes the images part of public art and their message able to reach a great amount of people (Jackson, 2008). It also shows that artist had a connection to the dissemination of this ideology. These images transcend space and time and show a unifying common belief of this civilization.

Dissemination of ideology—Craft Production

The production of this ideology was not only confined to the murals of the architectural complexes but also seen in ceramic and metal work. The Moche was a highly stratified society, and they were able to develop areas for specialized trade, among them was craft production. Cerro Mayal in the Chicama valley houses one of the best known centers of ceramic production (Jackson, 2008). The ceramic workshop was in use between the mid to late Moche (A.D. 550-800) and employed full time artists (Jackson, 2008; Jackson & Russell, 2001). Attached workshops such as this one enjoyed the support of patronage from the elites and the ceramic production was tied to the political and religious ideologies of those in power.

The craft specialist enjoyed the benefits of not having to collaborate in the agricultural process and instead they were provided with food stuffs (Bernier, 2010). There were different levels of crafts production; the attached workshops were highly dependent on the elite and the goods produced have a strong influence in the ideology. The independent craftsmen were not subject to the elite and were rendered to the law of supply and demand (Bernier, 2010). For the purpose of this study, I will focus on the attached craftsmen and their role in the dissemination of the ideology.

The attached craftsmen played a significant role in the political and religious sphere. In the Zona Urbana Moche, excavations revealed seven workshops that had been in use during Moche phase IV; these workshops had been dedicated to production ritual and domestic objects (Bernier, 2010). These workshops were often in close proximity to the architectural complexes, elite facilities or large storage facilities that administer the production (Bernier, 2010). In this manner the elite kept power over the dissemination of the ideology.

The excavation of the ceramic workshops reveals the use of highly advanced technology to produce the ideological goods. The use of turning plates to build these vessels and kilns has been uncovered within the workshops (Jackson,

2008). The ceramic craftsmen employed the use of mold technology to produce the ceramics, the stamp molds, one piece press molds, and multiple part molds created the ceramic that was disseminated in the north coast (Jackson, 2008).

Archaeological evidence

The archaeological evidence suggests that the Sacrifice Ceremony was a recurrent ritual (Bourget, 2001). The Huaca de la Luna houses one of the biggest sacrificial centers, located in Plaza 3A, a rocky outcrop marks the burial of 70 individuals who are believed to have been the sacrificial victims of this ritual (Bourget, 2001; Verano, 2001 & 2007). It is a selective pool of adolescents and adult males that show injuries of broken ribs, shoulder blades and parry fractures, suggesting these injuries were incurred during battle (Verano, 2007).

At Sipán, San Jose de Moro and Huaca de la Cruz there is evidence of sacrifice. The sites of what appear to be elite burials, individuals have been left on top of these interments; the sacrificed individuals could be acting as guardians (Bourget, 2001). In these sites the presence of religious ideology is strong as individuals wearing the garb of the principal actors in the Sacrifice Ceremony have been discovered.

The 1987 investigations led by Walter Alva and a group of archaeologist at the site of Sipan in the Lambayeque valley revealed three unlooted tombs and the resting place of the Warrior Priest, the principal figure of the Sacrifice Ceremony (Alva, 2001; Donnan, 1993). This discovery gave legitimacy to the practice of the ceremony as one of its primary individuals had been discovered. The Mochica participated in this ritual and its importance is apparent through the ubiquity of this image in the north coast.

In San Jose de Moro the excavations of female priestesses have been discovered. One of the females is holding an anthropomorphized staff that is speculated to have been used for the drawing of blood (Bourget, 2001 & 2006; Donnan, 2010). These females would have been the attendees of the Warrior Priest and linked to the Sacrifice Ceremony. The discovery of bodies that were disposed of after the sacrificial ceremony and of actors that wear the regalia of the gods makes the case that this ritual took place within the north coast and that this ritual was a widespread belief among the various valleys.

Conclusion

The archaeological and iconographic remains reveal a common practice engaged by members of different sectors of the north coast. These rituals were directed by individuals that dressed in the fashion of the gods and directed the procession of sacrifice. The dissemination of this ideology was widespread, and even though the north and south developed in different ways, they share a common ideology. The elite that presided over these ceremonies probably had an unthinkable amount of power as Bourget alludes that the sacrifice of the individuals coin-

Ritual Violence

cided with the times of rain and the peasantry could have believed that the elites held the power to bring the rains. The sacrifice of victims then becomes a manner for the elite to maintain power within their valleys. The ritual killings become a productive manner for the ancient world to create and maintain order. In this way, the connotation of ritual violence loses its negative perceptions and becomes an effective tool of order in the ancient world.

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“People who speak into your lives:” Exploring the central connections between former foster youth and mentors.

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Abstract

The purpose of this study is to explore what aspects in a mentoring relationship, according to former foster youth, are central to the connection between the youth and the mentor. This study also analyzed what role gender, race, and age may have played within those mentoring relationships. In this study, in-depth qualitative interviews were conducted on a total of 13 foster youth ages 18-27. Several follow-up interviews were conducted. Participants were given a short written demographic questionnaire. This study found that former foster youth-identified multiple factors that were central to their mentor-mentee relationships. Factors were categorized into two central themes-- (1) qualities of the relationship and (2) traits of the mentor. The data on the impact of gender, race, and age on the mentoring relationships were mixed and thus inconclusive.

Introduction

Recent studies have shown that mentoring relationships meet youths' critical needs for continuous supportive connections (Collins, Spender, & Ward, 2010). Studies also indicate that youth who have a positive and significant relationship with at least one adult, tend to have a better transition to adulthood (Collins et al., 2010). One at-risk population that may especially benefit from having mentors is former foster youth who have aged out of the system.

In 2012, almost 25,000 foster youth nation-wide “aged out” of the foster care system regardless of whether they were prepared to transition into adulthood (U.S. Department of Health and Human Services, 2012). According to Goodkind, Schelbe, & Shook (2011), foster youth typically age out at 18 despite the continued availability of services and support. Further, they found that youth aging out of the system generally do not do as well as youth not involved in foster care across a range of outcomes (Goodkind et al., 2011).

Foster youth who aged out of the system are at-risk for homelessness, low educational attainment, incarceration, and difficulties with employment and finances. They also are at-risk for parenting and substance abuse as well as mental and physical health problems (Osterling & Hines, 2006; Spencer, Collins, Ward, & Smashnaya, 2010). While certainly there are some youth that do make a healthy and productive transition into adulthood, a substantial number of youth do not reach graduate high school, attain gainful employment, or manage stable housing

(Spencer et al., 2010). Former foster youth are more likely to live in poverty and become parents prior to age 21 (Ponciano, 2013).

Overall, studies have suggested that the role of a mentor can have positive effects for at-risk youth (Collins et al., 2010; Dubois, Portillo, Rhodes, Silvertorn, & Jeffrey, Valentine, 2011; Osterling et al., 2006). Studies have shown that mentoring increases positive self-concept (Osterling et al., 2006). According to the National Longitudinal Study of Adolescent Health, youth who had a mentor before age 18 and for at least two years, had better overall health and educational attainment, while having lower physical aggression and suicide risk (Spencer et al., 2010). Studies have also suggested that mentoring decreases drug and alcohol use and decreases the use of violence (Turner & Scherman 1996; Zippay 1995; Thompson & Kelly Vance 2001; Grossman & Tierney 1998; Collins et al., 2010).

Studies on mentoring foster care youth have found positive outcomes. Programs such as Big Brother and Big Sisters of America serve youth and are encouraging a greater participation of foster care youth (Spencer et al., 2010). One study of foster youth found that after 12 months of participating in a mentorship program, foster youth exhibited improved social skills, ability to trust adults and higher self-esteem (Spencer et al., 2010). In a study of 339 19-year-old youth exiting foster care, those that had a natural mentoring relationship that had lasted over one-year reported lower levels of stress when compared to those with no mentors (Munson & McMillen, 2009; Munson, Smalling, Spencer, Scott Jr., & Tracy, 2010). Another study found that 310 foster care youth reported less suicidal thoughts, better overall health, fewer sexually transmitted diseases and less involvement in fights (Ahrens, Dubois, Richardson, & Lozano, 2008; Munson et al., 2010).

While several studies on former foster youth have shown that mentoring relationships can promote positive outcomes, none have asked youth to identify what specifically within the mentoring relationship was most powerful or salient to the youth. The purpose of this study is to explore perspectives of former foster youth regarding what qualities they view as central to the success of mentoring relationships. Special attention is paid to whether and how gender, race, and age operate within those relationships.

Methods

Participants were 13 foster youth. All reported the presence of a mentor when they were in the foster care system. 10 out of the 13 were former foster youth who aged out of the system between the ages of 16 and 18. Three out of the 13 were adopted early on while in the foster care system. There were five males, seven females and one declined to state their gender that were between the ages of 18 and 27 years. Eight former foster youth are Caucasian, three are mixed race, one is Asian and one is Latino. The number of homes the foster youth have entered ranged from 1 to 20. The number of mentors the foster youth had were between 1-3.

Foster Youth and Mentors

Participants were accessed through two organizations in Sonoma County that serve former foster youth. The first organization is Voice Our Independent Choices for Emancipated Support (VOICES). VOICES partners with 40 agencies from throughout Sonoma County, helping to provide services to transitioning foster youth ages from 16-24. The other organization is The Foster & Kinship Care Education Program (FKCE) at Santa Rosa Junior College. Their objective is to increase the academic performance of former foster youth in community college courses leading to certificate completion, graduation, and/or transfer. Other participants were contacted through the Seawolf Scholars Foster Youth Program at Sonoma State University.

Each participant was given a short written questionnaire asking basic demographic and background information. This included: gender and gender identity, sexual orientation, age, ethnicity, where they were born/grew up, the age they entered foster care, if they entered a formal mentoring program and if so which one, and lastly, the number of mentors (both formal and informal) they had throughout their lives. After the questionnaire was completed, there was an in-depth interview. These interviews lasted between 15-60 minutes. Sample questions included the following (not necessarily in the order below).

1. How might you define a “mentor”? Or what does the term “Mentor” mean to you? Have you ever had someone you would call “your mentor”?
2. What kind of mentors did you have in the past? Currently? 3. How did you meet them?
4. Tell me how you would describe your mentor?
5. What does/did your mentor add to your life?
6. What do/did you most like about your mentor?
7. What kinds of things do you talk to your mentor about?
8. What makes this person easy to relate to?
9. Can you give me an example of what makes this person _____?
(Insert description from previous question)
10. What do you think makes them someone that you choose to listen to?
11. Can you give me an example of some advice that your mentor gave you that you listened to?

12. Why do you value this relationship?

13. Does/did your mentor share the same ethnic/racial/class/gender/ background as you? Did this matter at all to you? Did it add something to the mentoring relationship?

14. Had s/he been a different (or same) ethnic/racial/class/gender/sexual identity background, what would have been the different or same?

15. Do you think having the same gender/race/ethnicity/class/sexual orientation for a mentor would be easier for you to listen and relate to them? If so, why or why not?

Interviews were audio-recorded. Six follow-up interviews were conducted. All interviews were transcribed and coded. Findings were highlighted and grouped together based on general themes and concepts that were supported from the quotes by the former foster youth.

Results

Two themes regarding mentoring relationship emerged from the interviews with former foster youth. These themes captured what they viewed as central to the connection between them and their mentor(s). These were: (1) qualities of the relationship and (2) traits of the mentor.

Qualities of the relationship	Traits of the mentor
Consistency	Positivity
Trust	Caring
Longevity	Relatability
Support	
Guidance	
Empathy	
Authenticity	

Qualities of The Relationship

Consistency: For many former foster youth, having someone who was “always there for me” or “there when you need them,” was of central importance. Such comments reflected this category of *consistency*. Youth appreciated knowing someone was always there, even if they wanted space or didn’t want to talk. Dolly, 25, who entered the foster care system when she was 14, had one mentor who was her ILP worker.

Foster Youth and Mentors

He gave me my space. When I was pulling away and I didn't want to talk to anybody and I didn't want advice and I didn't want someone putting these positive things down my throat. He was still there. He was like "alright come to me when you want to, come to me when you can. I'm always here." And he really was. When I finally made the decision that I wanted some support and some advice, he was there and I could always count him on for that.

Similarly, another former foster youth named Felix, 27, reflected on this quality in his two mentors who have been with him since he was just seven months old.

I think I value it because I don't have... I didn't have a lot of people I can count on and so them being kind of my rock or ground-ness, I think that's why I value them. I can always go back to them and *they are always there to support in any way possible* and they are always there giving me advice and they are always there talking to me and not condescending. I think that's why I value that relationship. There just, they're there. *That's what I need-- is someone who's there. I didn't have anyone growing up so and these are people who aren't going to ditch me* (itals. added).

Trust: This quality was an aspect of the mentoring relationship that the former foster youth indicated that they valued. Typical comments that conveyed this quality were: "I trust him," and "They are somebody who I can trust." Trust is built in many ways, but the most common way was the perceived willingness and desire on the part of mentors to invest their time in the youth. Daniel, 24 who entered the foster care system when he was three, had two mentors. One mentor was in a mentoring program called Foster & Kinship Care Education Program at Santa Rosa Junior College (SRJC) and the other mentor was his stepdad. He reported:

They believe in every single foster youth that comes through their door. They are willing to invest and give care and they come from a position where they are able to sustain that because they take care of their own. That rubs off on anybody and I mean it's very impactful to walk into a room full of people smiling who care about you. And so you begin to trust those words a little bit more and the consistency in which that happens... you open up. You let your guard down and go from there. That's probably the biggest strength and why I know I can trust them with my words and I trust them with theirs.

Longevity: Almost all of the mentors have been with the youth for two or more years. Some youth have mentors who have been with them since day one. Many of the youth responded by stating "She never left my side," and "They are the only ones who stayed." Michael, 18, who entered foster care at a few weeks old has had

a total of three mentors. One is from the Foster Kinship Care Education Program at the SRJC and the two other are his adopted mother and scoutmaster. In this quote, he explains how his adopted mother has been with him for 18 years and scoutmaster who has been with when he was in 7th grade until he graduated high school.

I had a couple mentors but my mother, my adopted mother has always been there for me, always been there for 18 years. It's just been us two. She's brought me up with strong foundations. Strong morals. She set her rules on me that I'll keep forever and really live by. She's just always believes in me. Also, I had a scoutmaster. I was in the boy scouts and my scoutmaster is the one who pushed me to get my eagle. He saw that I could, saw the potential in me and when I was giving up he said, "you can do it." He stuck by my side and really showed me what it is to be a leader and how much it means to other people so lead them in the right direction.

Support: All of the participants have stated that their mentors have truly "supported" them and helped them along the way. Common statements that reflected this sentiment include reference to how their mentor "stuck by my side," and "gave me constant support." Whenever the youth felt that they were falling down, the mentors were there to pick them up and give them the support they needed. Felix also mentioned that without his mentors' support, he would have not been where he is today—attending college. He explains,

This family ended up becoming my own family in a sense because I didn't really grow up with one. The father Ed, and the mom, Maurinne, really became my parents but at the same time became more than that. I really learned how to become self sufficient... These people are still in my life today. They are the ones that really essentially said if you really want to go to school we will help pay for it. And so that's what got me in the door.

Guidance: The majority of the former foster youth mentioned their mentors' "guidance" in numerous ways. The youth turned to their mentors for advice about family, friends, and dating relationships. They also asked for guidance about housing, jobs, and school as well as emotional help. Holly, 22, had a high school counselor who helped her get into college, guided her through applications and financial aid assistance.

My mentors, well the guidance counselor at high school, he was pretty professional. He would guide me through what I had to do to get to college, what kind of grades I had to get, and how to fill out an application. He would tell me how to do that and told me how to do FAFSA because I didn't know that. Here, Andres has guided me by telling me by what classes I should take to graduate

Foster Youth and Mentors

even though I'm a senior.

Empathy: All of the youth repeatedly stated that their mentors were very understanding and accepted them for who they were. The mentors had experienced similar challenges. They also mentioned that they felt that their mentors could better understand them because [of their] knowledge and awareness of the foster care system. Jilisa's story illustrates this aspect of *empathy*. Currently 24, Jilisa has had a few mentors through programs such as Big Brother Big Sister and CASA, but the only mentor she mentioned was her mentor from when she was little.

His understanding... just like his vast amount of knowledge... I mean he's seen it all, he hasn't done it all but he's seen most of it. So he just gives really good advice. And even if it takes me like a year to actually implement that advice, it's still useful.

As another example, KT (now 22) discusses her mentor, her long-time ILP worker,

As someone that is close like a friend, like a family, like a safety net... that I can call anytime and they are always there for you. They will make time for you and help you even if they are busy. They are a member of my family. I talk to them more than I talk to my family or my friends that I'm close with because as a mentor, they have the training. They took the classes and all of that so they have some experiences and understand what you are going through.

Authenticity: All of the youth in their interviews mentioned that their mentors showed genuine interest and caring. Many youth mentioned that their mentors were actively present and truly genuine, often sharing their own experiences. For example, Daniel shared:

Dan was a guy who didn't have to be a part of lives. [But] he came in and act[ed] as a father to me and my brother and my sisters. [He] provided for our family when we hadn't had a home. Who was the first male in my life to actually not be physically or verbally or mentally or emotionally abusive? Who honestly came in, just loved me and cared about me? So it's just he fact that he was there and [that] is the biggest example I can give.

Traits of the mentor

Positivity: Many of the former foster youth stated that their mentor was a very positive person who not only provided better mentorship but also gave them a positive outlook on life. Debbie, 19, entered the foster care system at the age of two because her mother suffered from a mental illness and her father was an alcoholic.

When she was placed into a foster home, she instantly bonded with her former foster mom who has been her mentor for over 12 years.

I think that's what makes her a positive person and strength because she's seen so many foster kids. The way she talks to me, she's never negative (and I've experienced negativity with my adoptive parents). With her, she doesn't ever have a negative thing to say. Even [if] she has a negative thing, she puts it in a way that's positive. "Well maybe this isn't the greatest way to do it, but here's another way to do it."

Caring: This trait was very important to many of the youth because it was hard to find those that they perceived as actually caring for them. Caring included not only a feeling, but a way of acting. The mentors were described as "kind," "compassionate," "patient," and "generous." Helga, 19, who had one mentor from a mentoring program called Be a Mentor reflects on this trait of caring

When I was younger, when I was 16, I was hospitalized for a suicide attempt and [my mentor] came and visited several days of the week while I was there at the mental hospital. Then when I was younger, this was a few months after the hospital, I was arrested and juvenile hall for three months and he came and visited me and took time out of work to come and see me. I thought that was pretty nice because I wasn't even getting much support from my parents at the time, but he was willing to.

Relatability: Several former foster youth really valued this trait in a mentor because it created a safe and comfortable environment to speak about their lives and open up. Statements that reflected this trait included, "Understanding where I am coming from," "Have been in my shoes," and "We had a similar background." Holly described a time where her mentor was able to relate to her.

I saw him once in awhile and talk and chat but until the break up. He was like, "you need to move on" and he was trying to help me. He actually cried a little bit because he went through a break up too on a personal level and he related to me. He definitely knew where I was coming from.

Age, Race, and Gender

The results of whether age, race, and gender played an important role between the mentor and youth, were mixed.

Age

All of the participants had mentors who were older than them. Nine out of the 13 said that age played an important role in their mentoring relationship. KT

Foster Youth and Mentors

explained her situation:

She's not old. She's around my age. She is [just] a couple years older and it's easier to have that connection with someone with the similar age as you. She also went to Sonoma State so we have that connection so we bonded through, like, the school we go to.

Also, Helga mentioned that age played a huge role in the mentoring relationship.

He's much older. He's probably about 70. I think that's another good thing is that because he's a lot older, he has all these experiences that he can kind of show me. Sharing some of my experiences he can kind of reflect upon them and similar things that happen to him.

Race

Nine out of the 13 had a mentor(s) who shared the same racial background (eight of these were white). After carefully analyzing the data, race appeared to play a slightly more important role to the youth of color, than the white foster youth. Results showed that 1) Caucasian youth (eight out of the total 13 participants), by and large, did not feel that race mattered. And that 2) for the five youth of color participants, two felt that sharing the same racial background was or would have been significant to them. And one youth of color felt that having a white mentor was significant in her relationship.

Felix, a Latino former foster youth, grew up with three Caucasian mentors and felt that all three factors (age, race, and gender) mattered to him, with race being the most salient.

It's interesting because I became self conscious with all the families I stayed with because I couldn't really figure out my identity. I was always adapting to the family I was staying [with], so it kind of screwed me up a little bit in terms of learning more about my own ethnic background. I'm not very Mexican. I don't sound very Mexican and so I was always self conscious about that. So for me I kind of wanted to stay with people of color so that I can learn and so it was very interesting and it was a very, complete opposite of what I wanted but in the end, I just learned to get over that. I learned to tell people who judged because I didn't act their way or look that way or whatever and I became more confident.

Having been born in Mexico, Felix was thought to have a learning delay with English. Adding to his outsider status, he described growing up riding a bike among other Caucasian kids and feeling out of place and "weird." He wanted to learn about his culture and wanted to have a family of color. Felix also believed that if he had had a Latino male mentor in his life, it would have been easier for him. Nonetheless he also concluded that his experiences with Caucasian mentors has

resulted in him being more open minded with people.

Only one youth of color believed that having a white mentor was positively significant. KT explains,

I feel like it's better for me to have someone that has a different race than me because they have a different perspective, they grew up in a different environment, and they see different things. So if I have someone who has the same race and same ethnicity, we already have the same mind set so it's going to be harder but having her it's easier because I'm learning from her and she's learning from me.

Gender

Three of the seven female participants stated that having a female mentor was or would have been significant to them. For example, Catey, who had only male mentors, stated that it would be nice to have a female perspective.

I think I would like a girl mentor. I would relate to them more and I would definitely like someone very similar to me because with my therapist, she's a girl but I don't know I feel really uncomfortable talking about stuff that's personal to me. I want someone comfortable that I can talk to. I want someone closer to my age and a girl.

Two of the seven female participants stated that having a male mentor was or would have been significant to them. Interestingly, one woman, Holly, who had a male mentor, explained that she appreciated having a male perspective in her life because it provided a different view on life. Thus, overall, five out of the seven female participants viewed that gender was significant.

Meanwhile, three of the six total male youth felt that having a male mentor was or would have been significant to them. Two of those pointed to the desire and impact of specifically having a 'father' figure. Michael explains why having a male mentor (his scoutmaster) was important to him:

Yes, it would be actually easier but it depend because I feel like being in the boy scouts and having my scout master as a male, not having a father really, it shows me like what I should be as a man... I think he's probably one of the best men I [have ever] met. It's really great to have him as a father. I don't have a father. I don't know what to expect from a father, but he's what I hoped for in a father so I looked up to him for that. Also, having my mom for more emotional kind of things is kind of cool because now I can relate to people more on an emotional level than most guys can my age can because they didn't grow up with a strong female in

the house. I just connect a lot better with people that way.

Lastly, it appeared that, for the vast majority of the participants, “sharing perspectives” and having a fit in terms of “personalities” was more important than sharing the same age, race-ethnicity, or gender background as their mentor. This was true across race-ethnicity and gender. Ryan’s reflections reflect this color-blind/gender-blind understanding of mentor-mentee relationships. He explained,

I think that a mentor is a mentor. Whoever it is, White, Black, Asian, male, female, just all across the board it’s mainly just respect that you’re respecting another person and you honor that other person advice and morals. But a lot of morals are based upon the experience you lived through and how much you’ve endured. When it comes down to it, a mentor should be anybody. A mentor could be anybody. A mentor is whoever you see who loves you in a way that you can trust.

Discussion

The purpose of this study was to explore and to better understand the perspectives of former foster youth in what they view central to the connection between the youth and the mentor. This study also analyzed if age, gender, and race operated within those relationships. Analyses of youth responses to a series of questions as well as demographics revealed information about who their mentors were, where they met them and for how long, what their mentoring relationships were like, why they value their relationships, as well as the mentor’s age, gender, and race.

The former foster youth had different perspectives about their mentors who they met informally or formally. In all the interviews, the foster youth expressed numerous ways in which their mentoring relationships were successful for them. There were two ways the foster youth expressed the central connection in their relationships: 1) qualities of the relationship and 2) traits of the mentors.

The qualities of the relationship were based on the former foster youths’ experiences with their mentors and the stories they shared. Many of these former foster youth went through numerous homes and cycled through many people in their lives before finding people who truly wanted to be there for them. The qualities that marked these mentor-mentee relationships included: consistency, support, guidance, empathy, authenticity, trust and longevity. These were stated in a variety of different ways and were repeated frequently during the interviews. These qualities in the relationship provided a space for the former foster youth to open up and to feel comfortable, loved, safe, and secure. It provided an environment for the youth to exceed past expectations. Their mentors had made a strong impact on all these former foster youth due to the qualities and traits of the mentoring relationship.

The former foster youth mentioned traits that made their mentoring

relationship more meaningful. The traits were positivity, caring, and relatability. Many youth stated that they were inspired by these traits and hoped to emulate their mentors.

As for age, race and gender, the results were mixed and, due to the small sample size, inconclusive. Nevertheless, those who identified as Caucasian predominantly stated that age, race, and gender had little impact on their mentoring relationship. Many of the Caucasian youth mentioned that “personality” and having a “different perspective” were more important rather than any single factor of age, sex, or gender. Meanwhile, the youth of color had a mixed response, with some feeling that sharing the same race would have been useful, while at least one, thought being of different races was beneficial. It is worth noting that none of the five youth of color had the same racial background as a mentor. There was one youth who had a similar background but the youth was mixed race. Overall, youth of color saw that age, race, and gender had operated within their mentoring relationships while the majority of Caucasian youth did not.

Conclusion

By hearing the former foster youth’s perspectives, there is a better understanding and stronger awareness of what makes an effective mentor-mentee relationship. As stated previously, many former foster youth are aging out of the system unprepared for the transition into adulthood. Many who are currently in the foster care system are also struggling to know that there is a transition period in their lives they have to face. While studies have shown that former foster youth tend to have negative outcomes, mentoring relationships have shown to promote better transition into adulthood and more positive outcomes. In this exploratory research, giving voice to the youth’s perspectives not only provides additional knowledge of how to become a better mentor, but illustrates that negative outcomes are not a foregone conclusion. With these results, mentoring programs can focus on nurturing these qualities and traits within their programs. Also, potential mentors could focus on developing these qualities. This research was able to identify seven key qualities of a mentoring relationship as well as three key traits in a mentor. All of the mentoring relationships in this research have promoted positive outcomes and a better transition into adulthood. Although the results for age, gender, and race were inconclusive, they can serve as a starting point for more research.

For future research, there needs to be more participants and a larger cross-section of race-ethnicity and gender. Asking more in-depth questions about age, race, and gender would have helped to gather more information as to whether such factors were central within their relationships. Future research might also consider why those who are Caucasian were less likely to identify race as being a key factor, and instead suggested that “personality” and shared (presumably non-racialized) “perspectives” were key. Lastly, expanding out to include not only former foster youth, but those who are currently in the foster care system would provide additional interesting insights into mentoring relationships.

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What Factors or Characteristics Influence Satisfaction with Family Quality of Life?

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Abstract

What factors and characteristics influence satisfaction with family quality of life? I propose that race and highest degree attainment will be the most significant factors and characteristics that influence the satisfaction. I hypothesize these to be factors in how you relate to life in general. The impact and significance of these factors on satisfaction influence family quality of life. Each factor of characteristic is dependent on and affects the other, changing their significance. I analyze information in the existing statistical data of the General Social Survey (GSS) from 2012, for my variables. The GSS dataset for 2012 has a total sample size of 4,820 respondents. For my dependent variable, satisfaction with family quality of life, the sample size is 3,557, which accounts for missing data. Family income is the most significant factor that influences satisfaction with family quality of life, followed by if you have children or not. It turns out that race or degree had no significance on how satisfied you were with family life as a whole. Vast majority of respondent's report that they are very satisfied with family quality of life, few respondents report being completely dissatisfied. The results confirm that race and degree have no statistical significance, but that family income does, after analyzing data.

Introduction

This research study examines what factors or characteristics influence satisfaction with family quality of life. The purpose of this research is to gain a greater understanding of what factors or characteristics influence satisfaction with family quality of life. This research study sociological significance because this provides insight and helps us to better understand the individual, social, and contextual factors that contribute to family quality of life. This topic is sociologically significant because the basis of our social relationships is often dependent on how satisfied you are with your own personal life. Factors that may influence satisfaction with family life include how much money you make, whether you are married or divorced, if are you a single parent, and/or if you live in poverty.

This research study uses data obtained from the 2012 General Social Survey and considers how race, sex, education, number of children, age, and whether you have been divorced influence satisfaction with family life. The findings in researching this topic will show how factors such as marital status, socioeconomic status and other influential factors and characteristics affect how satisfied you are

Family Quality

with your family life. Results using descriptive statistical analysis and multiple regression modeling suggest significant connections with race, sex and education on the satisfaction with adult's family life. All of these factors and characteristics shape our satisfaction with our happiness in life and in return our satisfaction with family quality of life

Literature Review

The purpose of this study is to learn what factors or characteristics influence satisfaction with family quality of life. Research suggests race, whether you are divorced or separated, income, education, and sex all influence family quality of life. Here I will focus on relevant research that examines what personal and social characteristics influence general satisfaction with family quality of life. Within my literature review, I looked at the relevant research that has been done on this topic. Other researchers used various methods of empirical research to gather information for their topics. This empirical research includes demographic questionnaires, surveys and probability sampling. Common variables used include status inequality, educational level, age, sex, marriage roles, race, income, and number of children in the house. Ball and Robbins (1986) use a multi-staged sampling cluster and conducts interviews, forming a subsample of 158 black men who resided with their wives.

Socioeconomic Status

A huge factor in how satisfied the respondents were with their family quality of life is their income level. Those who had a low income or an overall low household income stated that they were less satisfied with their family life (Adelmann, Chadwick, & Baerger, 1996). As a result, when you do not have a high income it limits your options to do what you want (Mansfield, Dealy, & Keitner, 2013, p. 301). Affordability is a huge factor for many aspects of life, such as mental health (Mansfield et al., 2013, p. 301), so having a low income does not allow you to get proper and affordable health care. The majority of those with low income were African Americans and those who did not go on to further or finish their education (Adelmann et al., 2013; Ball & Robbins, 1986; Mansfield et al., 2013).

Education

Having a good education was another important theme in the research related to satisfaction with family life. Ball and Robbins (1986) indicate that Black men found it hard to be able to provide for their family, due to factors associated with not being educated and then in return not getting a high paying job (Ball & Robbins, 1986, p. 852-853). This leads us into the previous theme of low income, Black husbands who feel as though they are failing to provide for their family resulting in less satisfaction with their quality of family life

(Adelmann et al., 1996; Ball & Robbins, 1986). This is in contrast to white males who obtain a higher education resulting with a better income, and satisfactory quality of family life (Adelmann et al., 1996; Ball & Robbins 1986).

Sex (Biological)

The third issue that arose during my literature review includes how your sex influences how happy you are individually and with your life. Findings in the research show that women tend to be much more dissatisfied with their quality of life, in comparison to men (Rose, 1955). The reasons associated with this feeling include: (1) not going into higher education and (2) feeling as though they don't have a significant or central role in their own personal life (Rose, 1955, p. 16-18). Rose (1955) explains that this dissatisfaction comes with aging during life, whether you are a housewife and what roles you take on at home and at work (18-19). Women who were dissatisfied were dependent on their husbands for majority of things and did not have a life of their own; everything was centered around the family (Rose, 1955). In contrast, those women with a higher education had more independence and felt like they had more to give, and therefore were more satisfied with their quality of family life.

This research focuses on what specific factors and characteristics shape satisfaction of family quality of life. Family life is important in every aspect of a person's life; the family is the root from which all develop their views. Demographic factors also greatly influence the satisfaction in family quality of life, including income, socioeconomic status, education, and sex. In doing this literature review, it helped understand that race is also relevant. Race influenced and played a role on income, socioeconomic status, and education. The findings from the literature review have informed and provided deeper knowledge on what factors, characteristics, and ideas contribute more so than others. Thus, this research project will build upon the existing research and focus on how outside factors revolve around race.

Theoretical Orientation

A Marriage and Family theoretical framework seemed appropriate for this study because the dependent variable, satisfaction with family quality of life, focuses on finding out what influences that level of satisfaction. The human ecology theory provides a strong theoretical orientation for this research because it not only describes the influence of marriage and family, but what in return influences it. This theory sees development and interactions as taking place in a secure system of environments ranging from the immediate microsystem (i.e. marriage, families and individuals) to the ecosystem, which encompasses the culture, natural environment, and global influences on individuals and relationships (Powell & Cassidy, 2007). You can simply ask someone how satisfied he or she are with their family quality of life, but the value of that response means nothing without knowing what

Family Quality

influenced that satisfaction. The independent variables (age, race, age when first kid was born, number of children, total family income, and highest degree earned), all influence satisfaction. The human ecology theory focuses on the fact that it is not possible to account for a person's development or relationships without looking at all the levels of influences surrounding that person or relationship.

Data and Methods

In this study, for analysis the use of the existing statistical data of the General Social Survey (GSS) from 2012, for my dependent and independent variables was appropriate. The GSS dataset for 2012 has a total sample size of 4,820 respondents. For the dependent variable, satisfaction with family quality of life, the sample size is 3,557, which accounts for missing data. Used the Statistical Package for Social Scientists (SPSS) software in order to evaluate descriptive statistics and to run a multiple regression analysis. With this information, it will facilitate how to fully understand how individual, social, and contextual factors contribute to family quality of life.

Dependent Variable

The dependent variable is satisfaction with family life. The following question was asked: "All things considered, how satisfied are you with your family life?" This dependent variable specifically looks at how satisfied you are individually with family quality of life. In many cases, we analyze the family as a unit and relate it to satisfaction, instead of each individual. The available response categories were based on level of satisfaction and include; Inapplicable (0), Completely satisfied (1), Very satisfied (2), Fairly satisfied (3), Neither satisfied nor dissatisfied (4), Fairly dissatisfied (5), Very dissatisfied (6), Completely dissatisfied (7), Cannot choose (8), and No answer (9). The frequency distribution for the data, looking at the valid percent box on Table 1, shows that 43.4% of respondents are very satisfied with family quality of life, 25% are fairly satisfied, and 20.1% are completely satisfied. The descriptive statistics in Table 2, shows similarity to the frequency distribution - Mean: 2.37, Median: 2 and Mode: 2. Measures of variability are as follows; Range: 6, Variance: 1.312, and Standard Deviation: 1.146. This variability suggests that there is low variability and that majority of respondents are very satisfied with their family quality of life in general. (See Tables 1 and 2 below for statistical references of this data).

**Table 1:
FAMILY SATISFACTION IN GENERAL**

	Frequency	Percent	V a l i d Percent	Cumulative Percent	
Valid	Completely satisfied	254	5.3	20.1	20.1
	Very satisfied	548	11.4	43.4	63.5
	Fairly satisfied	316	6.6	25.0	88.5
	Neither satisfied nor dissatisfied	72	1.5	5.7	94.2
	Fairly dissatisfied	41	.9	3.2	97.5
	Very dissatisfied	22	.5	1.7	99.2
	Completely dissatisfied	10	.2	.8	100.0
Missing	Total	1263	26.2	100.0	
	IAP	3518	73.0		
	Cannot choose	13	.3		
	NO ANSWER	26	.5		
Total	3557	73.8			
Total	4820	100.0			

**Table 2:
Statistics
FAMILY SATISFACTION
IN GENERAL**

N	Valid	1263
	Missing	3557
Mean		2.37
Std. Error of Mean		.032
Median		2.00
Mode		2
Std. Deviation		1.146
Variance		1.312
Range		6
Minimum		1
Maximum		7

Independent Variables

The independent variables used for multiple regression analysis are (1) age, (2) race, (3) respondents age when first child was born, (4) number of children, (5) total family income, (6) and highest degree earned. The independent variables are

Family Quality

coded as follows:

1. AGE= Age coded in years 18 to 89 or older
2. RACEAR= White (1), Minority (2)
3. Age when 1st child born AGEKDBRN= Age coded in years 13 to 53
4. Number of Children CHILDS= Number of Children the individual has
5. Family Income INCOME06= Income coded by income bracket
6. Highest Degree Earned DEGREE= High School (1), Junior College (2), Bachelor (3), Graduate (4).

Hypotheses

The following are predictions on how the independent variables will influence the dependent variable (satisfaction with family life):

H1: Older individuals will more likely be dissatisfied with their family quality of life, compared to those who are younger.

H2: Minorities will more likely be dissatisfied with their family quality of life, when compared to whites.

H3: Individuals who had children when they were younger will more likely be dissatisfied with their family quality of life, when compared to those who had children when they were older.

H4: Individuals with a higher number of children will more likely be dissatisfied with family quality of life, when compared to those with fewer children.

H5: Individuals with lower family income will more likely be dissatisfied with family quality of life, when compared to individuals with higher family income.

H6: Individuals with less education will more likely be dissatisfied with family quality of life, compared to individuals with more education.

Figure 1:

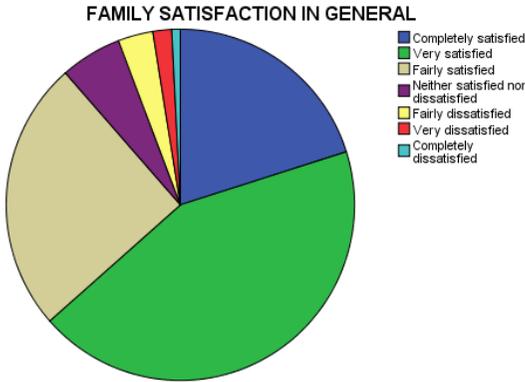
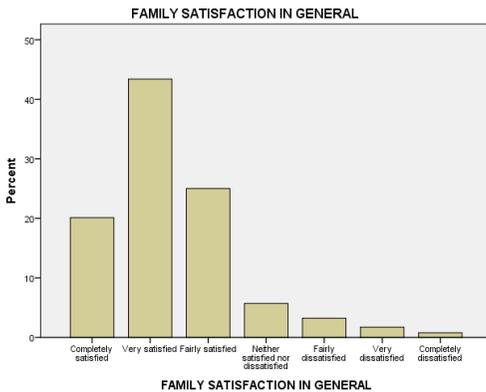


Figure 1 and 2: Family Satisfaction in General below show the results following the study and the percentage that and findings concluded following the study.

Figure 2:



Results

The Adjusted R-Square Value is .037; this indicates that the independent variables have accounted for 3.7% of the variance in the dependent variable (satisfaction with family life) (Refer to Table 3: Model Summary).

Table 3: Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.209 ^a	.044	.037		1.034

Family Quality

All hypotheses are confirmed, except for race and highest degree (Refer to Table 4). There is no significant relationship between race and satisfaction with family life or highest degree earned and satisfaction with family life. The coefficient for number of children is negative so this indicates that the prediction was incorrect. Individuals with a lower number of children are significantly more likely to be dissatisfied with quality of family life. The independent variables with the most significant results were family income, number of children, and age when first child was born. Referencing Table 4: Multiple Regression Table, shows that number of children has a negative coefficient, indicating that the prediction was wrong. Individuals with lower number of children will more likely be dissatisfied with family quality of life, when compared to those with more children. Family income ($r=-.179$, $p<.001$) contributed greatly to how satisfied respondents were with their family quality of life.

Table 4: Multiple Regression Table		
Standardized Beta Coefficients for Satisfaction w/ Family Life Multiple Regression Model, 2012 GSS (N=4,820)		
<i>Independent Variables</i>	Beta	Significance
Age	.078*	0.033
Race	-.050	0.162
Age 1 st Child Born	-.093*	0.019
Number of Children	-.089*	0.018
Family Income	-.179***	0.000
Degree	.063	0.121
Note: * $\alpha<.05$, ** $\alpha<.01$, *** $\alpha<.001$ (two-tailed tests)		

Discussion

Findings suggest that money has the most influence on how satisfied you are with life in general. Seeing that race and education had no influence whatsoever on the results was surprising. I figure that because they had no influence, whether you were white or a minority and had a degree did not matter, because income was the most significant. I would like to continue with this research and look further into how race could influence satisfaction with life, if other variables such as health, mental health, and sex are added and looked into more in depth. In previous findings suggested that race did play a factor greatly, but perhaps with the change in times it is not as significant. From my own experience I still feel that race and education play a huge role in life satisfaction, it is true you cannot get far in life without money, nevertheless, race and education play a role in the amount of money you earn playing a role in life satisfaction.

Limitations

One of the limitations in this study was not having more up to date research to review. Having more current and past research would have greatly influenced the proposed statistically significant variables and better insight. Had I looked into variable such as sex and health more I could have found more literature and information on those variables, making my reported research more significant. When I do further in depth research, I will look into more current information, to make my own research more significant.

Conclusion

There was no significant relationship between race and satisfaction with family life or highest degree earned and satisfaction with family life. The coefficient for number of children is negative so this indicates that my prediction was incorrect. Individuals with a lower number of children are significantly more likely to be dissatisfied with quality of family life. Research provides you with the structure needed to develop an understanding of how to approach certain topics and interpret them. My research topic looks at statistical data, which allows us to interpret the individual, social and contextual factors that contribute to family quality of life. The existing empirical research and data on satisfaction with family quality of life, gives great insight. Further, in depth research provided me with information on why certain individuals are more or less satisfied with their family quality of life. I plan to do further research on how sex, health and mental health influence satisfaction with family quality of life.

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Family Quality

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Hobby Lobby and Reproductive Politics: A Textual Policy Analysis

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Introduction

In this article, I deconstruct the Supreme Court's ruling on *Burwell vs. Hobby Lobby et al.* by using textual analysis to look at laws and policies involved in this case. The Supreme Court focused on an extremely narrow question concerning the rights of corporations and whether or not the contraceptive mandate presented in the Affordable Care Act of 2010 (ACA) violated the Hobby Lobby corporation's and Conestoga Wood's rights under the Religious Freedom Restoration Act of 1993. However, the Supreme Court did not address the far reaching implications of such a ruling, especially considering its impact on American women's reproductive rights and the consequences of giving corporations "religious rights." In addition, the Supreme Court did not discuss how the Affordable Care Act had effectively addressed the discrimination women have faced concerning their health care for decades.

Contraceptives are simply a fact of life for millions of American women. More than 99% of women ages 15-44 who have had heterosexual intercourse have used at least one form of contraception. This statistic raises the question: as a nation, how should we address this issue of creating and maintaining laws and policies that protect reproductive rights and eliminate healthcare discrimination based on sex? In her dissent, Ruth Badar Ginsberg declared that "women of childbearing age already spend 68% more on out of pocket health care costs than men. This is money that is diverted from paying for food, housing or transportation" (Finney, 2014, p. 2). High cost is one reason that a quarter of women elect against getting an intrauterine device or IUD (a long lasting form of contraception) which can cost about \$1,000. The cost of an IUD is nearly equivalent to a month's full time pay for a minimum wage worker. Well-known historian, Rickie Solinger (2005) argues that a woman's control over her body involves much more than the right to choose an abortion or to have fair access to contraceptives. For most women, deciding when and under what circumstances they have children can be one of the most impactful economic decisions of their lives. Before the Affordable Care Act, many women paid much more than their male colleagues for the same amount of healthcare coverage. In order to have an understanding of Reproductive politics, Solinger says one must take into account the many players shaping public policy such as lawmakers, educators, employers etc. as well as the consequences

Hobby Lobby

for women who obey or resist these policies. Throughout our history, regulating gender, race and class have been central to the effort to control sex and pregnancy in America. Solinger cites examples from the nineteenth century when the U.S government took away Native American children from their families to the forced sterilization of Latina women in the 1970's (Solinger, 2005, p. 1-25). Solinger and other reproductive scholars argue for an expanded understanding of Reproductive Rights. Reproductive Rights concern the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health.

“Burwell v. Hobby Lobby Stores Inc.”

“Being a woman will no longer be a preexisting medical condition” declared House Leader Nancy Pelosi (Finney, 2014, p.2). Part of this act required specified employer's group health plans to furnish preventative health care and screenings for women without any cost sharing requirements. This meant that women would be provided with free contraceptives and health care screenings through their insurance.

In the Supreme Court case, (2013) *Burwell v. Hobby Lobby Stores Inc.*, the owners of three closely held, secular, for profit corporations, in separate actions sued the Department of Health and Human Services (HHS) under the Religious Freedom Restoration Act (RFRA) and the free exercise clause seeking to reverse the mandate that requires them to provide contraception to their employees claiming that it violated their religious belief that life begins at conception. Hobby Lobby, Inc. employs over 13,000 people and operates more than 500 arts and crafts stores. The two other notable corporations involved in this lawsuit were for profit corporations: Mardel, Inc. (involved with Hobby Lobby Inc.) and Conestoga Wood. The individual owners of these corporations were opposed to certain forms of Food and Drug Administration (FDA) approved contraceptives that they believe prevented implantation of a fertilized egg. Hobby Lobby Inc. and Conestoga Wood Inc. assert that even though they are for-profit companies, they are capable of “free exercise of religion” and are entitled to protection under the First Amendment's Free Exercise Clause and/or the Religious Freedom Restoration Act of 1993. Essentially, the individual owners argued the ACA's requirements violated their own free exercise rights, even though the Act imposes no obligations on them specifically.

In March 2013, the U.S. Court of Appeals for the Tenth Circuit granted a hearing of the case, and in June, the appeals court ruled that Hobby Lobby Stores, Inc. is considered a “person” under the law and is thus entitled to religious freedom. The court ordered the government to stop enforcement of the contraception rule on Hobby Lobby and sent the case back to the district court, which granted preliminary injunction in July. In September, the government appealed to the U.S.

Supreme Court. The case was ultimately taken to the Supreme Court because it was unclear whether or not the HHS mandate/Affordable Care Act was considered unlawful under the RFRA.

Main Arguments Discussed in the Case

In the Supreme Court case, Hobby Lobby argued that the contraceptive mandate violated their religious beliefs that life begins at conception and therefore they were being subjected to a “substantial burden” by having to provide their employees with certain contraceptive coverage such as intrauterine devices and “Plan B” or pay a significant penalty for non-compliance to the government. HHS argued that the companies could not sue because they are for-profit corporations and the owners cannot sue because the regulations proposed in the Affordable Care Act only apply to the companies, and not to the individual owners themselves.

Although this case brought to light a host of issues concerning reproductive rights and public health policy as a whole, none of the implications of ruling in favor of Hobby Lobby, Inc. et al. were discussed in this Supreme Court case. The Supreme Court’s ruling simply states that the scope of this case concerned only whether or not HHS was violating the RFRA/Free Exercise Clause.

Laws and policies related to this case:

“The term corporation includes (an) association having a power or privilege that a private corporation, but not an individual or a partnership, possesses; partnership association organized under a law that makes only the capital subscribed responsible for the debts of such association; joint-stock company; unincorporated company or association; or business trust; but does not include limited partnership” (7 U.S. Code § 1507).

According to the Internal Revenue Service, a “closely held” corporation has 50% or more of its outstanding stock owned (whether directly or indirectly) by 5 or fewer individuals at any time during the last tax year.

(1993) Religious Freedom Act (RFRA) prohibits the Government [from] substantially burden[ing] a person’s exercise of religion even if the burden results from a rule of general applicability unless the Government demonstrates that application of the burden to the person.

(2010) Department of Health and Human Services (HHS) under the Patient Protection and Affordable Care Act of 2010 (ACA), which, as relevant here, requires specified employers’ group health plans to furnish “preventive care and screenings” for women without “any cost sharing requirements.” Congress did not spec-

Hobby Lobby

ify what types of preventive care must be covered; it authorized the Health Resources and Services Administration, a component of HHS, to decide.

The Free Exercise Clause reserves the right of American citizens to accept any religious belief and engage in religious rituals. The wording in the free-exercise clauses of state constitutions that religious “[o]pinion, expression of opinion, and practice were all expressly protected” by the Free Exercise Clause.[1] The clause protects not just religious beliefs but actions made on behalf of those beliefs. More importantly, the wording of state constitutions suggest that “free exercise envisions religiously compelled exemptions from at least some generally applicable laws.”[2] The Free Exercise Clause not only protects religious belief and expression; it also has been interpreted to allow the violation of laws, as long as that violation is made for religious reasons (McConnell and Posner, 1989, p.1-5).

In determining if the ACA mandate did in fact violate the plaintiff’s “rights”, a few main issues were discussed: 1.) Should corporations be seen as “individuals” protected under the law; 2.) If the ruling constitutes “substantial burden”; and 3.) If for-profit corporations should be allowed “special rights” much like non-profit religious institutions.

Federal law imposed this “obligation” to furnish no cost preventative health care and screenings for their employees directly on corporate employers and in the event of non-compliance, civil penalties can only be imposed on those employers. It imposes no obligations on the individual owners of these corporations. In addition, non-profit religious employers and their affiliates are exempt from this obligation (*Sebelius v. Hobby Lobby*, 2014, p. 38). It was also unclear whether the ruling constituted a “substantial burden” to the corporations. In part, because when followers of a particular religious sect enter into the commercial realm, they do so by matter of choice and in doing so accept the limits that their religious beliefs should not be the obligation or responsibility of their employees to uphold. Specifically, the free exercise right doesn’t include a religious exemption that operates “to impose an employer’s faith on employees” (*Sebelius v. Hobby Lobby*, 2014, p. 19). Also notable, is the fact that many religious non-profits, exempt from the ruling, have opted to let a third party handle group insurance contraceptive coverage. It has also been brought to attention in the media and other sources that Hobby Lobby Inc. and others could have simply elected to not offer insurance coverage for their employees because of their religious objections.

The Ruling

On June 30th, 2014, the Supreme Court made their decision. The majority opinion of the court was delivered by Justice Alito. The majority opinion of the Court decided that the HHS regulations presented in the contraceptive mandate were in fact violating these closely held corporation’s rights under the RFRA. Even though HHS argued that for-profit corporations cannot sue simply because they are designated as “for-profit”; the majority opinion believed this left mer-

chants with a difficult choice to give up the right to seek judicial protection of their “religious liberty” or forgo the benefits of operating as corporations. In relation to the RFRA’s protection of “persons” the majority opinion stated that “RFRA’s text shows that Congress designed the statute to provide very broad protection for religious liberty and did not intend to put merchants to such a choice. In this ruling, Justice Alito employed the familiar legal fiction of including corporations within RFRA’s definition of “persons,” stating that the purpose of extending rights to corporations is to protect the rights of people associated with the corporation, including shareholders, officers, and employees” (*Burwell v. Hobby Lobby Inc. et al.*, 2014, p.3). Even though the “religious rights” of these employees are not being violated by these corporations, their reproductive rights are. Yet, there are no other laws or policies, besides the ACA, that even attempt to establish that contraceptive coverage on a group health insurance plan is a “right” of all individuals under the law.

Discussion

Although the Supreme Court case examined whether or not the ACA’s ruling violated these corporations “rights,” it did not examine the broader implications of ruling that corporations are in fact protected under the RFRA. In other words, a corporation’s religious freedom is now protected under the law.

From the start of our government, the Constitution’s protection of religious liberty has been seen as a personal right. This is because personal religious rights have been inextricably linked to the human capacity to express devotion to a god while acting on the basis of reason and conscience. George Washington called this the “characteristic rights of freemen” (*Sebelius v. Hobby Lobby*, 2014, p.4). A business corporation by its very distinction as a business, not a human being, lacks the basic human capacities such as reason, dignity and conscience which are central to religious belief and in turn the free exercise right (*Burwell v. Hobby Lobby Inc. et. al*, p. 4). Furthermore, the owners of these for-profit corporations are not personally required to offer healthcare options that go against their religious beliefs, only the corporations themselves have that responsibility under the ACA. In the first congress, James Madison summarized our founding father’s vision for corporations, “[A] charter of incorporation...creates an artificial person not existing in the law. It confers important civil rights and attributes, which could not otherwise be claimed” (*Sebelius v. Hobby Lobby*, 2014, p. 9). Corporations have never been given the same rights as individuals, although they are given certain Constitutional rights in order to enter into contracts, own and possess property and manage their affairs accordingly. Even though corporations enjoy these given rights, it does not then give them vindication for their claim to what is “essentially human autonomy and dignity” (*Burwell v. Hobby Lobby Inc. et al*, 2014, p.10). In this particular case, the Third District Circuit appropriately stated that corporate owners cannot “move freely between corporate and individual status to gain the

Hobby Lobby

advantages and avoid the disadvantages of the respective forms” (Sebelius v. Hobby Lobby, 2014, p. 28).

When Hobby Lobby Inc., Conestoga Wood Inc. and Mardel Inc. entered the commercial realm and incorporated their for-profit businesses, they did so willingly. These corporations are not individual persons protected under the First Amendment with religious liberty. It is well understood that a for-profit corporation as an employer has no right to subject their employees to their own personal religious beliefs, just as the United States government can only burden the “corporation as an employer” to furnish their employees with access to contraceptives through group insurance plans under the ACA.

Additionally, while the case remained pending by the Supreme Court, new information concerning the Hobby Lobby Corporation’s 401(k) plan was brought to light by “Mother Jones” Molly Redden who reported that their employee’s 401(k) retirement plan, to which the company matches contributions, “held more than \$73 million in mutual funds with investments in companies that produce emergency contraceptive pills, intrauterine devices and drugs commonly used in abortions.” This information was not considered in the court case and raises serious questions concerning the sincerity of their religious opposition to having insurance companies provide the same drugs. Hobby Lobby declined to comment on these allegations.

Following this Supreme Court ruling, Governor Mike Pence introduced Indiana’s Senate bill 568. Senate bill 568 is a controversial bill that protects religious freedom much like the RFRA. Additionally the bill is titled with the same name “Religious Freedom Restoration Act.” Earlier this year, the bill was signed into law by Governor Mike Pence. This law could ultimately give business owners legal recourse to not serve lesbian, gay, transgender or transsexual patrons at their establishments. This could be extremely problematic when the law provides protection for business owners who wish to discriminate against others who do not share or oppose their religious views.

Another act in reaction to the ruling called “Not my Bosses Business Act” was introduced by Sen. Patty Murray (D-Wash). This act sought to reverse the religious exemption granted to for-profit corporation Hobby Lobby Inc. by the Supreme Court which allows them to impose their “sincere religious beliefs” on female employees regardless of their (female employees) personal beliefs or medical decisions. Murray stated in an interview with ABC News “If bosses can deny birth control, they can deny vaccines, HIV treatment or other basic health services for employees or their dependents” (Lefferman, 2014, p. 1). This act was also supported by a statement from Barry Lynn, executive director of American’s United for Separation of Church and State who added “Scientology-believing employers could insist upon non-coverage of its nemesis psychiatry. And Jehovah’s Witness corporations could demand the exclusion of surgical coverage under the theory that so many of such procedures require the use of whole blood products, forbidden by their faith” (Rovner, 2014, p.3). Laws like the RFRA and the RFRA law in Indiana leave legislators little room to argue when they chose to protect one

religious view over another and because of the way these laws are being interpreted. What would stop business owners with religious views opposing vaccines and blood transfusions from being protected under these same laws?

The Supreme Court's rulings set the standard for the lower courts and ultimately provide rulings that serve to clarify our laws. In her dissent, after the majority opinion was announced on the Hobby Lobby case, Justice Ruth Badar Ginsberg stated "In the Court's view, RFRA (1993) demands accommodation of a for-profit corporations religious beliefs no matter the impact that accommodation may have on third parties who do not share the corporation owners religious faith...in these cases, thousands of women employed by Hobby Lobby and Conestoga or dependents of persons those corporations employ" (Burwell v. Hobby Lobby Inc. et al., 2014). Unfortunately, this ruling has served to aid the creation of new laws that protect the religious freedom of business owners at the expense of others.

Conclusion

In the Burwell v. Hobby Lobby Inc. et al. case, the Supreme Court was faced with a complex issue that involved much more than a clearer interpretation of the RFRA. Horwitz (2014) states "Courts are rarely at the forefront of significant social change. Judges are constrained by their function: to decide specific cases, based primarily on a finite (if malleable) set of materials such as prior precedents and statutes" (p. 1). After the recent interpretation of the RFRA under the free exercise clause, the Supreme Court has inevitably ignited a spark that continues to influence our society including what is perceived as ethical and what is protected under the law. Where do lawmakers draw the line between the protection of religious freedom and the protection of our indelible human rights? Such as protection against discrimination based on sex, gender, economic status, sexual orientation and ethnicity. The Affordable Care Act was the first to address years of gender discrimination through our health insurance system. It is the only act of its kind that attempts to equalize healthcare access and cost. Based on recent proceedings taking place in Indiana and the outcome of the Burwell v. Hobby Lobby Inc. et al. case, clearer boundaries need to be drawn not only for implementation of religious beliefs within the commercial realm, but for corporations and their growing power within our government.

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Reduction of Molecular Oxygen by Glutathione Persulfide

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Abstract

Hydrogen Sulfide (H_2S) is an endogenously generated small molecule-signaling agent with an impressive array of reported biological activity. It has previously been hypothesized that H_2S itself is the species directly responsible for the related physiological effects; however, recent work from this lab and others indicates that persulfides (RSSH) may be the important effector species. Indeed it is now proposed that the detection of H_2S in biological systems may act more as a marker for the presence of persulfide activity within that cell. In order to clarify more specific mechanisms through which persulfides act, an investigation into the chemistry must be carried out. The work described herein attempts to elucidate some basic chemical properties associated with glutathione persulfides, specifically, the reaction of persulfides with molecular oxygen (O_2).

Introduction

Hydrogen Sulfide (H_2S) is classified as one of the endogenously generated signaling molecules analogous to nitric oxide (NO) and carbon monoxide (CO) that have important physiological processes (Fukuto et al., 2012). It is believed that H_2S also has important biological function (Wang, 2012; Kajimura et al., 2010; Kashfi & Olson, 2013; Kabil et al., 2014). One of the potential pathways for biosynthesis of H_2S may be initiated from a preexisting persulfide (RSSH). Previous research has focused on H_2S and did not fully consider the possibility that persulfides could be the relevant mediator for the biological effects. Although H_2S has been linked to important biological functions, (Wang, 2012), the chemistry of such conditions is not well understood. In the search for this unknown mechanism, current research has shown that persulfides may be the predominant species under such conditions (Ida et al., 2014; Wright et al., 2006; Souness et al., 2013; Pan & Carroll, 2013; Francoleon, 2011). It has been hypothesized that persulfides are the important biological facilitator, and H_2S may be a degradation product (Ida et al., 2014; Ono et al., 2014).

The endogenous biosynthesis of H_2S has been attributed to three different processes, which include the enzymes: cystathionine γ -lyase (CSE), cystathionine β -synthase (CBS) and 3-mercaptosulfurtransferase (MST) (Kamoun, 2004; Fukuto et al., 2012). In a biological system H_2S can further react via thiol (RSH) redox exchange and led to high levels of a variety of persulfide and polysulfide species such as glutathione persulfide (GSSH). These enhanced sulfur compounds have the potential to alter the specific functions of their thiol precursors, potentially altering

Molecular Oxygen

the activity/function of numerous cysteine thiol dependent enzymes/proteins. Due to this important biological relevance, *in vitro* studies need to be conducted. The goal of such research will allow insight into the specific chemistry of persulfides, relative to their thiol counterparts, to distinguish the mechanisms of action and purpose of endogenous persulfide production (Fukuto et al., 2012). The focus of these studies is to examine interaction of persulfide with molecular oxygen (O_2) and the effects of metals on the reaction mechanism.

Materials and Methods

All commercial reagents used were of the highest quality available and purchased from the following suppliers: sodium phosphate monobasic, sodium phosphate dibasic, phosphoric acid, Reduced glutathione, oxidized glutathione, sodium cyanide, and dithiothreitol were obtained from Sigma–Aldrich (St. Louis, MO). Sodium sulfide (Na_2S) was purchased from Alfa Aesar A Johnson Matthey Company (Ward Hill, MA). Glycine crystalline powder and tris(hydroxymethyl) aminomethane triple crystallized freebase was purchased from Fisher Scientific (Waltham, MA). Immobilized tris(carboxyethyl)phosphine (TCEP) disulfide-reducing gel was purchased from Thermo Scientific (Waltham, MA). 4-(2-Hydroxyethyl) piperazine-1-ethanesulfonic acid (HEPES) was purchased from Acros Organics (New Jersey). $Cu^I(CH_3CN)_4ClO_4$ was synthesized in lab (Hemmerich & Siewert, 1968).

Experimental setup

Experiments were performed at room temperature in YSI Model 5300 Biological Oxygen Monitor cylinder glass reactor, equipped with a magnetic stirrer. The reactor was closed with a piston containing a Clark oxygen electrode. The electrode piston contained a small opening to allow reactants to be added to the system via a syringe with a needle elongated with a plastic tube (Figure 1). The oxygen electrode was calibrated with air-saturated demineralized water and set to 100% in working buffer solution. The reaction was initiated by injecting solutions (for details see below) to 3.0 mL of a buffer solution followed by O_2 percentage measurement over time.

Glutathione persulfide formation in Biological Oxygen Monitor reactor

Stock solutions of Na_2S , GSSG, and GSH were prepared in 100mM Tris buffer, pH 7.4. To make glutathione persulfide, first the O_2 monitor is equilibrated to 100% in 100mM Tris, pH 7.4 buffer and record for 10 minutes. The reaction was initiated by injecting 100uL of 30mM GSH to the reactor (after addition of a reagent to the reactor it was followed by recording O_2 percentage over time). Next 100uL of 3.0mM Na_2S was injected, and finally 100uL of 30mM GSSG was injected to the Clark oxygen electrode.

In-situ formation of glutathione persulfide

A stock solution of Na_2S was prepared in 1.0M Tris pH9.0 buffer flowed by pre-treated for polysulfide impurities using Immobilized TCEP resin (for details see below). GSSG stock was prepared in 200mM HEPES buffer, pH 7.4. The reaction is initiated by the addition of 150uL of 0.12M Na_2S to 300uL of 200 mM GSSG with 150uL of 200mM HEPES buffer, pH 7.4 in a capped plastic microcentrifuge tube. The reaction is placed at room temperature for 30 min. Next, 100uL of the persulfide solution (contained 30mM of Na_2S and 15mM of GSSG) was injected to the Clark oxygen electrode reactor-containing 200mM HEPES pH 7.2 buffer and the O_2 percentage was measurement over time and compared to Na_2S incubation without GSSG.

Reduction of polysulfide

A) Reducing polysulfide impurities from Na_2S via DTT or NaCN:

Stock solutions of Na_2S , DTT, and NaCN were prepared in 0.1mM glycine buffer, pH 10. The reduction of polysulfides in Na_2S via DTT initiated by the addition of 100uL of 0.6M Na_2S with 100uL of 0.9M DTT in a microcentrifuge tube and incubated for one hour at room temperature. The reduction of polysulfides in Na_2S via NaCN initiated by the addition of 100uL of 0.6M Na_2S with 100uL of 0.9M NaCN in a microcentrifuge tube and incubated for one hour at room temperature. After the incubations 50uL of each reaction at separate experiments was injected to Clark oxygen electrode reactor containing 0.1M Tris, pH7.4 buffer to analyze oxygen consumption and compared to 0.6M Na_2S incubation with 0.1mM glycine buffer, pH 10.

B) Reducing polysulfide impurities from Na_2S via immobilized TCEP disulfide reducing resin:

Immobilized TCEP gel comes in demineralized water and before use the DI water is exchanged with working buffer using procedure from manufacture. The reducing activity of the immobilized TCEP gel was also examined utilizing the manufacture procedure (calculated 11mM TCEP equivalents in the gel slur). To begin reducing polysulfide impurities a stock solution of Na_2S were generated using 1M Tris, pH 8.2. Next, add equal volumes of 0.3M of Na_2S to the 5.5M TCEP gel in microcentrifuge tube. Incubate for 15-30 minutes and invert every three to four minutes to resuspend gel stopping it from settling down to the microcentrifuge tube. After incubation, centrifuge the tube at about 1000 x g for 1 minute. Finally, 100uL of 0.15M Na_2S supernatant was injected to Clark oxygen electrode reactor containing either 200mM HEPES, pH 7.2 buffer to analyze oxygen consumption.

Molecular Oxygen

Glutathione persulfides O₂ consumption facilitated by metals

Stock solutions of GSSG and GSH were prepared in 200mM HEPES, pH 7.4. Stock solution of Na₂S was prepared in pH 10, deionized water. Stock solution of Cu^I(CH₃CN)₄ClO₄ was prepared in 200mM HEPES, pH7.2. To make GSSH, first the O₂ monitor is equilibrated to 100% in 200mM HEPES, pH7.2 buffer and record for 10 minutes. The reaction was initiated by injecting 100uL of 30mM GSH to the Clark oxygen electrode reactor. Next 100uL of 3.0mM Na₂S was injected, and 100uL of 30mM GSSG was injected to the reactor. Finally, 100uL of 300uM Cu^I(CH₃CN)₄ClO₄ was injected to the Clark oxygen electrode reactor and O₂ percentage was recorded over time.

Results and Discussion

To study the chemistry of persulfide in lab, H₂S in the form of a stable salt Na₂S is used to generate persulfide. The pK_a of H₂S is 6.8 and the pK_a of HS⁻ is approximately 14. Therefore, at physiological pH, the monoanion HS⁻ is the major species with minimal concentrations of S²⁻. Under these conditions HS⁻ is able to nucleophilic attack a disulfide to generate the corresponding persulfide (Figure 2). To study the fundamental chemical biology of persulfide oxidized glutathione (GSSG), a biological relevance common disulfide, is used to generate GSSH.

Molecular oxygen (O₂) is commonly found in the environment and has an important role in various biological functions. Previously it was found that the stability of persulfides was diminished when kept under aerobic conditions, therefore, it was hypothesized that persulfides might be reacting with O₂ (data not shown). To further understand the interaction of persulfide with O₂, some fundamental chemistry of O₂ is herein discussed. O₂ contains a bond order of 2, and it is a common biological species. It is paramagnetic and has a triplet state due to lone pair of electrons, as shown in the molecular orbital diagram. Due to these properties it will readily react with other paramagnetic species, radicals (Fukuto et al., 2012). Having a triplet state also diminishes spontaneous reactions with other singlet species due to a kinetic barrier and it will not spontaneously oxidize other species due to a thermodynamic barrier (Fukuto et al., 2012). This chemistry prevents easy uncatalyzed O₂ reaction with thiols but it does occur in aerobic conditions with a very slow rate constant (Bagiyan et al., 2003). Persulfides are considered to be better reducing agents than the corresponding thiol (Everett & Wardman, 1995), and the pK_a of a persulfide is around 8, allowing it to be both anionic and protonated under physiological conditions (Figure 3). These properties allows for a more feasible reaction between persulfide and O₂.

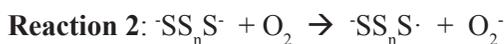
The reaction of GSSH with aqueous O₂ was monitored using Clark electrode, which monitors O₂ consumption over time. In (Figure 4), first GSH (1 mM final concentration) is added to a buffered aqueous solution (pH 7.4) causing minimal consumption of O₂. After, the addition of Na₂S, to the buffered solution containing GSH, an increase of consumption of O₂ arises followed by a slower

rate. When GSSG is added to solution, an increased stable rate of O₂ consumption occurs, which is hypothesized to be due to GSSH generation. In (Figure 5) the addition of pre-incubated Na₂S [1.0mM] and GSSG [0.5mM], to produce GSSH, consumes O₂ at a higher rate than just Na₂S [1.0mM], which further indicates persulfide react with O₂ at a faster rate.

As mentioned previously, the reaction of RSH with O₂ occurs at a slow rate as shown after the addition of GSH compared to the addition of GSSG to Na₂S generating GSSH (Figure 4). It is proposed that GSSH, when deprotonated to GSS⁻, directly reacts with O₂ to produce the glutathione perthiyl radical (GSS⁻) and superoxide (O₂⁻) (Reaction 1). The perthiyl radical has resonance stability, which could be one of the reasons why GSSH reacts at a faster rate than the corresponding thiol, GSH (Ono et al., 2014).



As shown before, after the addition of Na₂S to the solution caused an increase of O₂ consumption (Figure 4 and Figure 5), which has been accredited to polysulfide (-SS_nS-) impurities in the purchased Na₂S. Analogous to the reaction of GSSH with O₂, it has been proposed that polysulfides react similarly with O₂ (Reaction 2). When the Na₂S polysulfide impurities solution is pretreated with reducing agents to produce relative pure H₂S. The reducing agents used were: dithiothreitol (DTT), sodium cyanide (NaCN), or resin-bound tris (2-carboxyethyl) phosphine (TCEP). After the treatment, the O₂ consumption decreased (Figure 6) which indicates that polysulfides, such as GSSH, react with O₂ and not H₂S itself. TCEP resin is preferred when pretreating Na₂S impurities due to the easy procedure that is used to remove it from the treated solution via centrifugation, shown in (Figure 7).



As presented so far, from the O₂-consumption experiments, GSSH reacts with O₂ at a faster rate than the corresponding thiol, GSH. It has been shown that thiols are more readily oxidized by O₂ in the presence of metals (Bagiyan et al., 2004; Golchoubian & Hosseinpoor, 2007). Therefore, it was hypothesized that persulfides would react in a similar mechanism. As shown in (Figure 8) after the addition of cuprous acetonitrile complex (Cu^I(CH₃CN)₄⁺) to a solution of GSSH a rapidly increased the rate of O₂ consumption appears, an indication of a metal mediated process. This result is likely due to the fact that the persulfide is a better one-electron reductant than the corresponding thiol and future work will be done to examine the reaction mechanism.

Conclusion

The results discussed previously provide insight into the biochemical

Molecular Oxygen

properties of persulfides, specifically its reactivity with O_2 . Glutathione persulfides react slowly with O_2 , although considerably faster than the corresponding glutathione thiol. Similar to thiols, the rate of reaction of persulfides with O_2 has been shown to increase by the addition of metals. Future studies will be conducted to further analyze the mechanism of reaction, between persulfide and O_2 , and the metal mediated process.

Abbreviations

H_2S : Hydrogen Sulfide

RSSH: Persulfides

RSH: Thiol

O_2 : Molecular Oxygen

Na_2S : Sodium Sulfide

GSSG: Oxidized Glutathione

GSH: Reduced Glutathione

GSSH: Glutathione Persulfide

HEPES: 4-(2-Hydroxyethyl) Piperazine-1-Ethanesulfonic Acid

Tris: Tris(Hydroxymethyl) Aminomethane

TCEP: Tris (Carboxyethyl) Phosphine

NaCN: Sodium Cyanide

DTT: Dithiothreitol

Acknowledgments

This work was supported by NSF grants (CHE-1148641 and HRD-1302873). I would like to thank Dr. Joseph Lin, Simran Saund, the rest of the Fukuto group, and the rest of the Lin group for their contribution. I am also grateful for the support given by McNair Scholar Program and LSAMP.

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Appendix

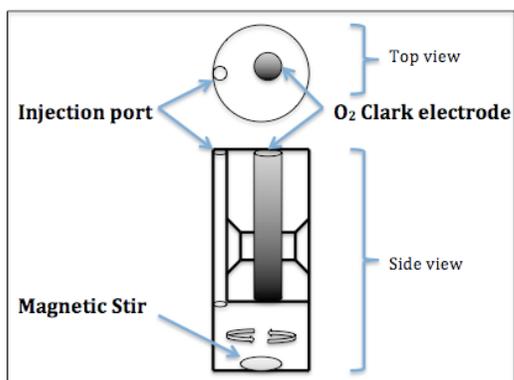


Figure 1. Diagram of the YSI Model 5300 Biological Oxygen Monitor. Experiments used the Biological Oxygen Monitor cylinder glass reactor, equipped with a magnetic stirrer, which allows O₂ to be evenly distributed. The reactor was closed with a piston containing a Clark oxygen electrode.

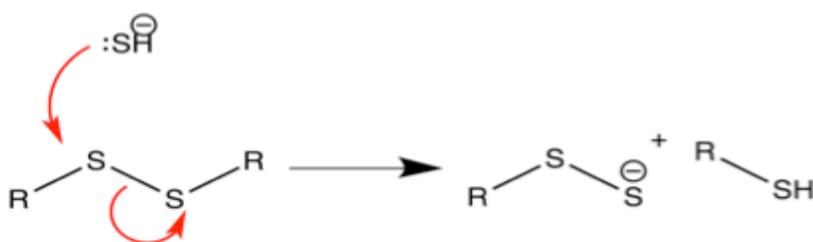


Figure 2. The *in vitro* mechanism for Persulfide Generation. The current chemical method of persulfide generation for *in vitro* studies relies on nucleophilic attack by H₂S on GSSG releasing GSSH and GSH.

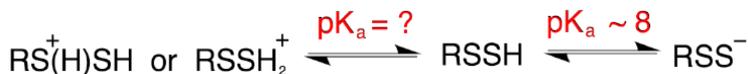


Figure 3. Chemical Properties of Persulfide. With a pK_a near physiological pH, persulfides display both electrophilic and nucleophilic characteristics in pH 7 solutions. At high pH only the anionic species exist and at low pH both singly and di-protonated species are thought to be present.

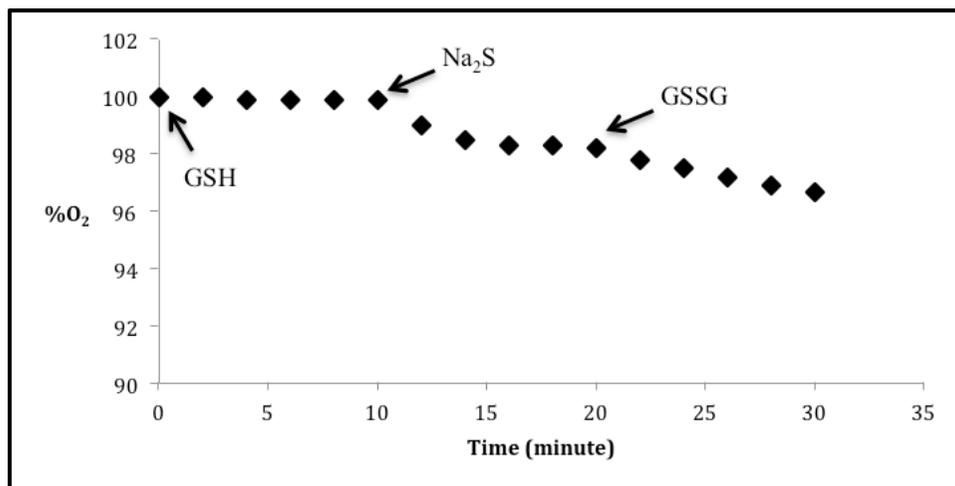


Figure 4. O₂ Consumption by Glutathione Persulfide. Consumption of O₂ by glutathione persulfides was monitored using a Clark electrode. O₂ consumption is initiated by the addition of GSH [1.0mM] to Na₂S [100uM]. Initial O₂ decline after addition of Na₂S is due to impurities in the purchased Na₂S.

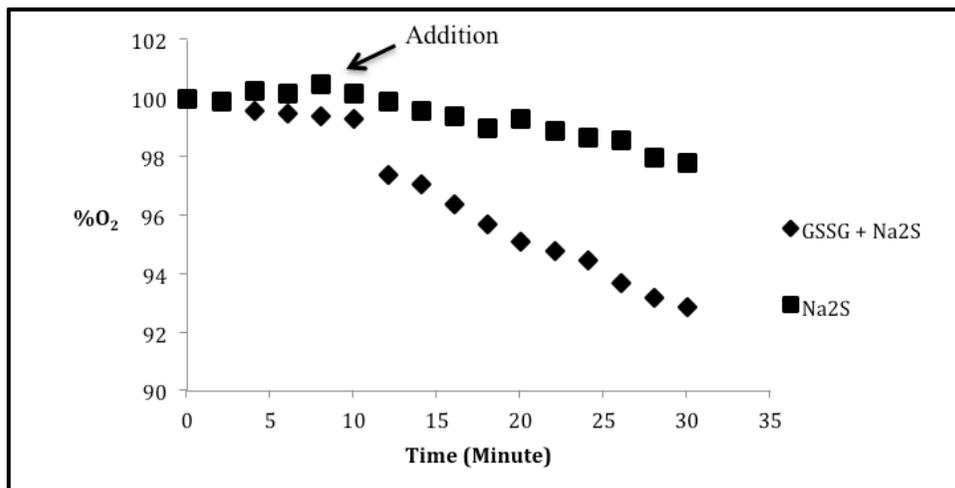


Figure 5. O₂ Consumption by Glutathione Persulfide Versus Na₂S. Addition of pre-incubated Na₂S [1.0mM] and GSSG [0.5mM] to produce glutathione persulfide consumes O₂ at a higher rate than just Na₂S [1.0mM]; Na₂S was pre-treated with TCEP-gel to take out polysulfides impurities.

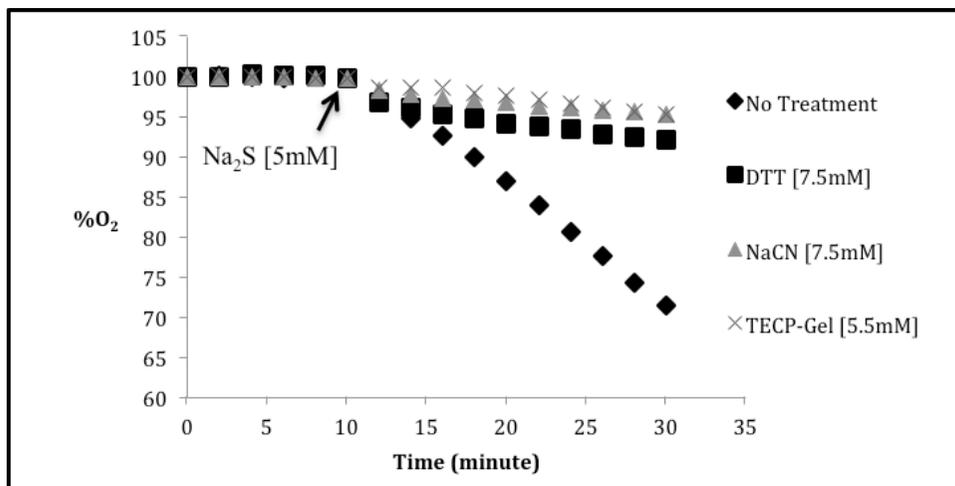


Figure 6. Reduction of Polysulfide Impurities by DTT, NaCN, TCEP resin. Polysulfide impurities, present in Na₂S, consume O₂ resulting in a decrease in O₂ concentration. Treatment of Na₂S [5mM] with various reducing agents and nucleophiles removes the impurities stabilizing the O₂ concentration.

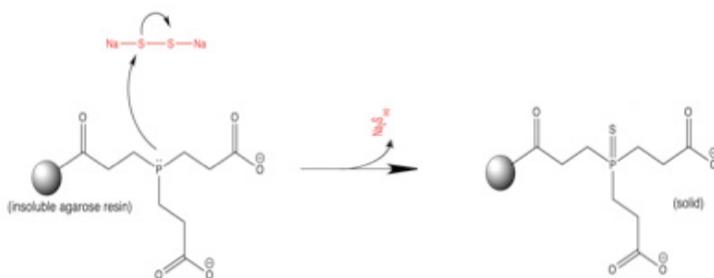


Figure 7. Reduction mechanism of TCEP immobilized resin. The proposed mechanism of the reduction of Na_2S polysulfide impurities via TCEP immobilized resin. The resin allows for easy separation process between the reducing agent and the purified Na_2S .

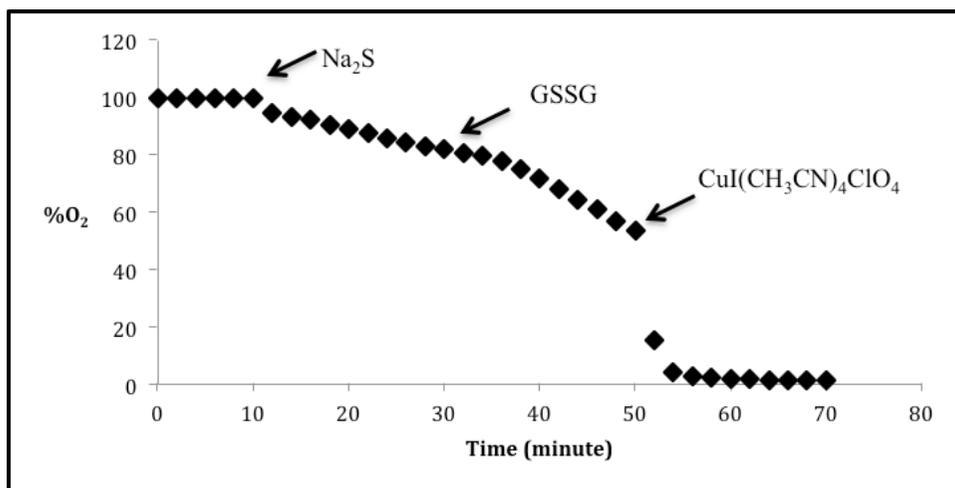


Figure 8. Metals facilitate Glutathione persulfides O_2 consumption. O_2 consumption by glutathione persulfide is shown upon addition of GSSG [1mM] to Na_2S [100uM] and a change in slope is shown after the addition of $\text{CuI}(\text{CH}_3\text{CN})_4\text{ClO}_4$ [10uM], indicative of a metal mediated process.

The Significant Difference of School Performance Between African Immigrant and Native-born African American Students

**Sosina Teweldebrhan, American Multicultural Studies
Research Mentor: Christina Baker, Ph.D.**

Abstract

The purpose of my research is to examine the difference in school performance between African immigrants and African American students. Current data shows that African immigrants have higher academic achievement than native-born African Americans, however, through my literature review I have found that this is an understudied topic. By conducting in-depth interviews with African and African American college students, my goal is to understand why there is a significant difference between the school performances of these two groups. I am hoping that this research will give school administrators an opportunity to better support this group of students based on their particular needs.

Introduction

Schools regularly collect data related to the educational outcomes of students; however, there is often no distinction made between African immigrant students and African American students. Does that mean these two distinct groups of students are seen as one? If so, this is problematic because it masks the true performance of both groups of students. This may be especially problematic for African American students, who have experienced long term systemic educational inequalities. The results of African immigrant students may skew the results for African American students, which may result in African American students not getting the support they need. Additionally, there may be ways in which schools can provide support for African immigrant students who are currently being ignored.

This research addresses the difference in school performance between African immigrants and African American students. For example, “African immigrants to the U.S. are more highly educated than any other native-born ethnic group, including white Americans. Some 48.9 percent of all African immigrants hold a college diploma. This is slightly more than the percentage of Asian immigrants to the U.S., nearly double the rate of native-born white Americans, and nearly four times the rate of native-born African Americans” (Butcher, 2007). This success though proves to be harmful for African American students because the data hides their performance, Butcher states in the report entitled “Top Colleges Take More Blacks, but Which Ones?” Sara Rimer and Karen W. Arenson (2004) observe “top universities in America have become fertile ground for African im-

migrants. Harvard University even revealed that two-thirds of the population of its Black students was not traditional African Americans” (Rimer & Arenson, 2004). Unfortunately, the academic outcomes of native-born and immigrant students are often combined in educational research. This may contribute to institutional racism by systemically and inconspicuously excluding African American students from institutions of higher education. The significance of the present study is that it will allow schools to see that it is important to examine immigrants and native born African American students independently in order to better address the needs of each population. Educational institutions should isolate the performances of these groups of students so that they are all getting the appropriate support.

Research Objective

My research objective is to address the following question: Why do African immigrant college students perform better academically than native-born African American college students? As the data illustrates, on average, African immigrant students perform better than African American students. By conducting interviews, I will find the reason for the different performances of African immigrant students and African American students. I will be able to find out whether it is motivation, skills, resources, etc. In order to address my research question, I will interview African immigrant college students and African American college students to see if they have different educational experiences. I also plan to address the following research questions: Do African students receive more social and financial support (from family, institutions, government, etc)? Do African immigrant students possess cultural or human capital that contributes to their success? Are African immigrant students motivated by the prospect of returning home or financially supporting family in their home country?

Literature Review

Gibson and Ogbu highlight cultural factors in order to explain the different performances of African immigrant students and African American students. They state that “Immigrant blacks from Africa and the Caribbean are more likely to do better than African Americans in the United States and the same goes for Mexican immigrants and Mexican Americans” (Gibson & Ogbu, 1991, p484). Ogbu explains several reasons why voluntary minorities (e.g. African immigrants) perform better than involuntary minorities (e.g. African Americans). The difference between voluntary and involuntary minority students in the United States is related to the process by which members of the racial or ethnic group initially became part of this country. Voluntary minorities are in the US mostly by choice. They may face challenges and inequality when they move here, but this is generally temporary, and is much less intense than the inequality experienced by involuntary minority groups. Voluntary minorities are in the US because they have better

School Performance

prospects here than in their home countries and are motivated to overcome the struggles they face here, since they chose to be here. They are motivated to do well economically and take advantage of the opportunity they have found. However, involuntary minority groups initially became part of this country without having a choice (e.g. slavery or colonization). Involuntary minorities have experienced much more long-term inequality and discrimination. To members of involuntary minority groups, it seems like their fate to live in a systemically racist society that works to their disadvantage. Ogbu argues that they have less hope and motivation to get themselves out of it since it's all they might have experienced.

Another difference between native-born students and immigrant students is that these two groups have different sources of support. For voluntary minorities, getting good grades and succeeding in school is not a choice; it's a must to maintain the families respect and honor. If voluntary minority students fail in school they are shaming their parents but also undoing all their hard work and sacrifice. Whereas for involuntary minorities there is not the same type of pressure. Even when their families encourage them to do well, the students see it as a contradiction when they see their parents do not have a college degree (Gibson & Ogbu, 1991). Another difference Ogbu and Gibson mention is voluntary minority students are not affected by the negative racial stereotypes that are part of the American culture (they don't have internalized oppression). They often just compare themselves to people from their community rather than "Americans." They also have more options than nonimmigrant minorities knowing that if they are not rewarded for their skills they can go back to their homelands or to other countries. In this sense immigrant minorities have more hope for the future because they see their problems as temporary. Comparing themselves to their peers or relatives from their country of origin, they realize they are better off (Gibson & Ogbu, 1991).

Claude Steele discusses the ways that negative stereotypes about African American students' intellectual ability affects their academic performance. Steele explains that stereotype threat is "a situational threat--a threat in the air--that, in general form, can affect the members of any group about whom a negative stereotype exists (e.g., skateboarders, older adults, White men, gang members). Where bad stereotypes about these groups apply, members of these groups can fear being reduced to that stereotype. And for those who identify with the domain to which the stereotype is relevant, this predicament can be self-threatening" (Steele, 1997, p. 614). Steele explains that when African American students begin school, their performance is comparable to their peers from other racial groups with similar characteristics. But soon after, there is a noticeable difference in grades, based on race. Through several experiments, his research demonstrates that African American students are not lacking skills or intelligence; these factors do not account for differences in performance between African American students and other students. When African American students are in a situation where they feel they may be judged or evaluated based on a negative stereotype, the possibility of confirming that stereotype becomes a burden that affects their performance, which places African American students at a disadvantage in academic settings,

compared to other groups. However, when African American students are in situations where their racial identity is not viewed as a significant factor, African American students' performance is comparable to white students. For example, African American students attending historically Black institutions perform better than or similar to their peers (Butcher, 2007).

Steele's theory indicates why African immigrant students do better in school, compared to African American students. If African immigrants don't identify themselves with the host culture and have not internalized the negative stereotypes about African Americans, then they are not as likely to be negatively affected by stereotype threat. Also, since they weren't born here they have different experiences with white people. Most of them have only met white people that visit Africa as volunteers or tourists. It's less likely that they have encountered racist whites or being discriminated against in work places because of their race.

Although African immigrant students have higher educational attainment than African American students, African immigrants are faced with many issues like getting the adequate support they need to successfully transition to the American school system and culture. Angela Valenzuela (1999) and Margaret Gibson (1988) have both made significant contributions to literature related to the experiences of immigrant students within the school system.

Gibson's (1988) book about Sikh immigrant students highlights the difficulties immigrants face in the American school system. Despite their struggles, they succeed. Gibson points out that immigrant students of all ethnic groups perform better in school than native-born students (Gibson, 1988). In her book Gibson discusses in detail the issues faced by Sikh immigrants going to a US school and why they do well in school despite the difficulties they face. One explanation is that the issues they faced in their home country are considered greater than the issues they face in the US, so they push through without complaining. In the US, immigrant students face challenges such feeling pressure to assimilate, getting passed the culture shock, language barriers, and the pressure they face from their families and communities to succeed. The Sikh parents always encourage their children to stay close to their roots, which is a struggle for their children, when they have to survive in an environment where they are very different from their peers. To avoid isolating themselves from other students, the Sikh students often found themselves having to adopt certain aspects of the culture of their peers. They are also able to succeed in school because of their parents' expectations and family responsibility. At a young age the students are expected to help their parents. To help their parents they must do well in school but also work and take care of themselves. One of the theories for their success was self-reliance (Gibson, 1988). The students are made responsible and treated like adults so they start looking at themselves like adults as well by helping their parents.

In her book *Subtractive Schooling: U.S.-Mexican Youth and the Politics of Caring*, Angela Valenzuela discusses the difference in school performance between different generations of Mexican-American students (1999). Valenzuela explains that immigrant students perform better than later generations. Valenzuela

School Performance

argues that the school system at Seguin High School, where she undertook her studies, is a subtractive educational environment, meaning that the school does not draw from the cultural background of the predominantly Mexican-American student population. Instead, the students' ethnic backgrounds are viewed as detriments, and students are discouraged from developing their strengths. Students are left with a school that is lacking in resources and where many students feel that teachers do not care about their education. She explains the school neglects those who come from poor communities and with little skills. However, Valenzuela says Mexican-born youth are better prepared when they go to school than US born Mexican youths whom the school doesn't favor. Mexican born immigrants generally view school more positively and they feel that the school and the teacher are there to help them where as US born Mexicans don't feel the same way. In fact, they are more likely to have the belief that the teachers don't care (Valenzuela, 1999). Of course this greatly hinders how students experience school and their performance. Although this book was about the experience of Mexican immigrants and native-born Mexican immigrants, the experience of these students was similar to African immigrants students and native born African American students. In both cases the immigrant students performed better in school and the native students struggled with their identity.

Butcher's recent (2007) article about African immigrants paints a picture that is similar to Valenzuela's study. African immigrants are outperforming other immigrants and African Americans. Butcher claims that African immigrants are beating the odds and becoming the new model minority. Of the African-born population in the United States age 25 and older, 86.4% reported having a degree or higher, compared with 61.8% of the total foreign-born population (Butcher, 2007). More specifically, 78.9% of Asian-born immigrants and 76.5% of European-born immigrants have college degrees. Even though the academic performance of African immigrants is outstanding, they are given even less attention than other immigrant groups. Butcher's findings were similar to Gibson's: the success of African immigrants in school was due to personal determination, family and self-expectation. African immigrants, similar to Sikh immigrants, had the mindset that now that they are in the United States they have to seize all the opportunities they're given so they can have a better life and support their families. Like Sikh students, African students also struggle with language and cultural barriers, but the only difference is that African immigrant students are not given as much attention as other immigrant students. Somehow they are left in limbo because educators don't know how to help them. "These young Africans are therefore coping in isolation in their schools. While the current system of American education is not deliberately excluding any groups of students, I have, however, noticed various ways that African-born learners are being kept in limbo" (Butcher, 2007). Butcher mentions that while for other immigrants the school system makes effort to connect them to their language and heritage nothing is being done for African immigrant students.

Hypotheses

Based on my review of the literature, I propose several hypotheses. Similar to Gibson's study, I hypothesize that African immigrant students are more determined to succeed in school because of the support they receive from their family. Due to Ogbu's theory related to the different perspectives of voluntary and involuntary minority groups, I also think that immigrant students are more motivated to succeed in school. Finally, I expect that negative social stereotypes have more of an effect on the success of African American students. Therefore, while African American students are made to believe that they cannot succeed, immigrant students are being pushed to succeed.

Research Methodology

To answer my research question and test my hypotheses, I will conduct 30 interviews 15 with African immigrant and 15 African American college students. I will conduct in-person and phone interviews with individuals. I will complete interviews in person, whenever possible. However, I will have to conduct some phone interviews because my study is taking place at Sonoma State University, which is a predominantly white university, which has a very low number of African immigrant students. So, I will need to reach out to African immigrant students at other colleges, whom I may not be able to meet with in person.

I will start the interviews in September of this year (2015) and I expect to complete the interviews within two months. I will send out emails, announce at student clubs, and personally reach out to the people I need to interview. I will ask questions about some of the following topics: high school experiences, college preparation, social support, college experiences, and stereotypes. A detailed interview guide included at the end of this research proposal.

Interview Guide

Can you describe your high school experience? Your college experience? Was it positive or negative? Why?

How well did you perform in school in the past? What was your GPA? Did you earn mostly As, Bs, or Cs? Have you failed any courses? Have you ever been on academic probation?

Did you complete any advanced or college prep courses? What were they? Did you have credits from high school transferred to college?

How well do you perform now?

What motivates you to succeed in school?

School Performance

Why did you decide to attend college?

Who motivated you to go to college?

How prepared did you feel when you were going to college?

Did you always know that you would go to college?

When did you decide to go to college?

Who helped you apply to college?

What do you think has helped you succeed in school? In high school or college? Or both?

Do you feel that your family has played an important role in your success?

Have you faced any challenges in school? How did you handle these challenges?

Did all your friends go to college? If not why do you think that is?

Why do you think students drop out or don't come to college? Have you ever considered dropping out? Why? Why did you stay?

Do stereotypes affect you? If so, how?

Do you feel your school is supporting you? How?

How long do you expect to take you to graduate?

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Black Women's Perspectives on Higher Education

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Abstract

This article analyzes some of the factors that affect female African American¹ students as they journey through their higher education at a Predominantly White Institution (PWI). Fifteen in-depth interviews were conducted which asked about these women's social and academic experiences. Their responses varied when it came to ideas of a lack of events being catered to them, having to be the spokesperson for their race, as well as issues regarding racial tensions in their interactions in academic and social settings. Overall many women expressed not feeling a part of the campus community. There are various aspects of the PWI that need to be adjusted to better retain and support this growing group of women.

Introduction

There is a need to better understand Black women's experiences, both positive and negative, of what they have faced in their journey to continue their education at a Predominantly White Institution (PWI). This research study focuses on the question of, what are Black women's experiences in higher education in regards to their social and academic interactions with others in and outside the classroom.

This study further elaborates on why African American women are staying at Predominantly White Institutions and how their social experiences are not the same as other students. Posing questions such as -did these women have support systems to help them throughout their journey within higher education? Did they have obstacles that other students did not have to experience? Also the study will compare the social and academic settings for these Black women and how they were treated.

Literature Review

There have been a few studies about Black women in higher education. Some of the authors of these studies include Brower, 2004; Guffrida, 2010; James, 2010; McCabe, 2009; Shropshire, 2006; and Sims, 2008; Mitchell, 2000; Munsch, 2005; Robertson, 2005; Sculco, 2002. The research suggests that many women of color, specifically Black women, experience different interactions among their

1 African American and Black are used interchangeable due to the participants using both.

peers, teachers, staff and the school's administration. From what was found there were two relevant topics that arose: 1) microaggressions and 2) Irrelation, which is lack of social relations between black female students and other students and faculty.

Microaggressions

McCabe (2009) states that a microaggression is when "...subtle and covert acts, often identified as verbal or nonverbal insults" towards subordinate groups in society are enacted against these individuals in interactions (McCabe, 134). This can be seen throughout everyday encounters and can be done by justifying stereotypes, exclusion, isolation and racism. This is done through social interactions among groups on campuses on a daily basis. Examples of microaggressions are saying things like, "blacks are here for meeting quotas," giving someone a degrading look or saying, "well I don't think of you as African American or Mexican." Being in spaces like these are very unhealthy emotionally and physically for minority students. The effects of being in these types of spaces can cause a person to feel isolated and not wanted at the university. Microaggressions can happen in the classroom as well (McCabe,2009). Some of these examples are ignoring Black women's opinions in the classroom and designating them to be the token Black spokesperson for their race. These types of actions are giving into stereotypes that all Black people think and act the same way, which is not accurate.

Munsch (2005) elaborates on other side effects of microaggressions faced by Black women, adding that these women feel ostracized and removed from extra-curricular activities due to subtle remarks about their gender or race. Many social settings are not welcoming to Black women. Since other groups do not welcome these women, they have to create their own minority students organizations on campus where they can feel and be comfortable in their own skin. Brower (2004) explains how joining these organizations and having a small group of friends is a way of coping in "belonging-within-alienation." Highlighting how these women are trying to find a sense of belonging and being wanted, even though they understand that they are alienated from the larger college culture. In the classroom, Black women do not feel like peers, and teachers treat them differently. At times these women feel like their input tends to get ignored.

Irrelation

My second focus is the concept of Irrelation. Irrelation is a major problem that occurs at PWI's. This is when, "... an individual or group functions within a social setting without a high level of relationship of connection with other members of that community" (Sims, 2008). Many African American female students deal with this feeling at a PWI. They know that they are a part of the university officially but don't seem to be able to connect or make relationships within the larger

Black Women

campus community. Also the school's campus climate plays a large factor. If the campus climate is not very welcoming to Black students then it is more likely that students of color will experience racism, sexism and other subtle forms of micro-aggression. This can also apply to the lack of diversity and structural diversity the campus has according to Shropshire (2006). Since irreligion is happening to these students, it takes a toll on how they are connecting to the PWI overall. Analyzing the PWI as a whole will help answer questions of how African American women feel about attending these types of universities.

Munsch (2005) also talks about some of the effects of irreligion and how not connecting to the university can hinder students' motivation academically because the school is not tending to their overall needs as students. Munsch (2005) explains how PWI course material does not reflect the accomplishments, experiences, and interests of African American students. These institutions need to create more curriculum that attracts more students of color if they expect these students to succeed. Robertson (2005) highlights that when budgets need to be cut, PWIs usually cut from minority programs first. They are cutting programs that help the adjustment and development of Blacks and other minority students. Most of these programs help Black women and other students of color stay enrolled at PWI's. He also explains how it's hard to create relationships with white faculty at PWI due to social discomfort. Shropshire (2006) points out how PWIs tend to give their students a "traditional" education versus learning more about other cultures, lifestyles and experiences. Typically there aren't many classes, speakers or events targeted to the African American community; that in turn also reinforces the perception that the University does not care about the wellbeing of this specific group of students.

Given this information, it's very clear why there is a need for more studies on this topic. There is a lack of direct studies about African American women's experiences at Predominantly White Institutions. While doing this research, it was apparent that Black female college students have not been studied much academically. Surprisingly, while there is more research on Black men than Black women; this is about Black female students in higher education. This work is crucial due to the increase of Black women attending and graduating from universities, in particular those that are considered PWIs.

Methods

From the data in the literature review there were many different methods that were considered in how to conduct this study. McCabe's (2009), Robertson's (2005) and Sculco's (2002) were the most appropriate methods. Their methods consisted of conducting one on one in-depth interviews with various open ended questions asking about the participant's experiences. These methods were the most appropriate due to the lack of Black women available to interview. The participants need to have a platform where they can elaborate further on their experiences versus completing a survey. This method would be best due to being able to get a more in-depth understanding of these women's everyday experiences that they

encounter while attending a PWI. Also doing a method like a survey or group style interview may not allow interviewees to answer all of the questions thoroughly. Overall, due to such low statistics this method would help get as much information as possible.

One on one in-depth interviews with open and closed-ended questions were used for this study. Each interview was recorded in confidentiality with the participants. The interviews were conducted in a quiet setting that made them feel comfortable to open up about this topic. The goal was for students to give stories, examples and self-reflections of their experiences. There were three sections of questions. The first section was introductory questions to make the participants feel comfortable. Then the next section was about the social experiences that these women have experienced at Sonoma State University. Lastly, these questions were about their academic experiences at Sonoma State University. Examples of questions used can be found in Appendix (A).

Sample

The group that was studied were all African American female college students who currently attended Sonoma State University. There were a few criteria for picking these women for this study. The women had to be Black/African American identified, females, current students at Sonoma State University, who were freshman to seniors, and had had experiences in social and academic settings. To see list of participants check Appendix (B).

This criteria helped to pick Black women from different age groups like Robertson (2005) did from freshman to seniors. From that pool of women interviewed, there were ones who were very involved on campus to women who were not as involved. It is important to pick women at different ages and different stages in college to see if there are any connections between their age and their social and academic experiences at Sonoma State, a PWI.

To find participants the methods used were email, text messages and word of mouth. Finally fifteen women responded. After the research was done, one woman graduated and one transferred schools.

Findings

There were many themes that arose including being the spokesperson for all Black people and a lack of programs and events to help retain African American women. The main themes this study will be focusing on are microaggressions and irrelation. The first theme found in this study suggests that many African American female students experience microaggressions throughout their everyday college journey. Thirteen out of fifteen interviewees expressed this feeling and have had it directly affect them in both academic and social settings.

Black Women

My participants Rebecca, Cotie, Deborah, Claudia and Alex explained how microaggressions have been directed at them in social settings and how that has affected them. Rebecca talks about her experience with microaggressions while walking around campus, “But um I love this question because I encounter things like this all the time. People walking more over because they don’t want to stand by me. People staring at me. Just feeling negative energy.” She expressed that students have told her, “I don’t know how to approach Black people.” She is shocked that people can’t treat her like a normal human being, just like everyone else. She also felt like she wasn’t in a safe space during most class discussions. She has had discussions about White privilege and it has turned very racially hostile. Being the only Black woman in her classes, she was subjected to a lot of microaggressions, like unwanted looks and comments. Unfortunately, that was not the first time this had happened to her. Her professor and peers didn’t expect her to sit up front, ask questions and care about her education. From her perspective, when she did these things they got annoyed or were shocked she actually cared about her education.

Cotie also discussed incidents of microaggression that have occurred to her. A classmate said something very offensive to her. A female student told her, “...I had pretty hair for a Black girl.” Most students don’t see anything wrong with making statements like this. What this student said was very racist due to the assumption that Black women have coarse and hard to maintain hair. It’s a stereotype that Black women cannot or do not have beautiful hair overall.

Deborah explains how she feels at social events on and off campus. She says, “Like, when we go to on-campus activities, most of the other students kinda like only talk to the people that they know...” Also she said that most White students “don’t know how to mix very well, and I think it’s more on their side.” It’s disappointing that these women feel this way. They have tried to reach out to other students and for the most part they do not receive good feedback or receptiveness. Deborah also states how she usually gets these demeaning stares. “White students, they stare at me like I’m some type of exotic animal, or like they’ve never seen a Black person before, and that’s kinda a little uncomfortable.” These looks are microaggressions. No one wants to feel like they are on exhibit or display just because they are not part of the majority in that setting.

Claudia talks about being an outsider in social interactions. Claudia brought up the fact that there is a new form of racism. People tell her, “...well you don’t talk like a Black person.” She gets that a lot from friends and family because she speaks very proper English. She hates when people bring that up about her. She feels as if every Black person speaks differently and shouldn’t have to meet a certain criteria of what a Black person is supposed to do.

Lastly, Alex expressed that she did not experience many microaggressions due to her class standing of being a freshman but her main concerns were the very visible racism that students show towards her. At tabling events she hears people say, “oh no no”. Some clubs will tell their members not to reach out to Black women. This goes back to the idea that Deborah brings up that even when Black women do try to branch out and eradicate these racial barriers, there is so much resistance.

Cheyenne, Aliah, Kamryn, Christen, Bria and Ryan discuss more about microaggressions in academic settings between their professors and peers. Cheyenne and Aliah felt this same way, especially in their history classes. Cheyenne felt it when the class would have discussions about slavery and how the teacher would say the word “Black” in class. She said, “It was one of my history classes and it was the way that my teacher said Black. Like he just had this negative connotation when he would say it.” To her it felt like a very subtle insult. Aliah would often question herself about why she was even in class. Also questioned should she why even try to get a good grade when she felt this bad vibe from her teacher. She said, “sometimes if I asked the teacher or professor a question, I feel like I’m over looked and my ideas are kinda ignored.” They both expressed that there was a stigma in the overall classroom setting towards African Americans.

Kamryn had experienced many different types of subtle insults, mostly from her biology teachers. She was asking a professor some general questions about being a biology major, and he, the professor, just assumed that she wanted to only get her Bachelors of Arts and not her Bachelors of Science. Obtaining the BS is harder due to the classes and the advanced materials that are covered. Then she told him she wanted her BS and she asked him what made him think that she wanted her BA; he said because it was easier. She took that as an insult that he thought she wasn’t smart enough to get her BS. She asked him “what would you recommend to your children to get?” and he right off the back said a BS because there are more opportunities. Kamryn explains that she thought, “that because it was harder, i.e., ‘I’m not smart enough to do that,’” he didn’t want to elaborate any further with her; she left his office after that. This is a very accurate example of microaggression; why wouldn’t the professor have tried to set her on the highest academic direction possible? Also she explained she receives a lot of subtle comments like, “You’re a biology major?” or “That’s hard.” Students act shocked that she’s not only taking science classes but is majoring in biological science as a Black woman.

Also Kamryn expressed an incident in a classroom setting were they were talking about intersectionality. She talked about being a Black woman on this campus and how it can be hard. The class didn’t want to hear about Black women’s struggles, and they told her to answer the question in a nicer way, which in fact she did. The majority of the students weren’t ready to hear some of the things she had to say about her experience. They didn’t want to accept or acknowledge that these things occur to Black women on this campus. She explains that there have also been subtle comments made about Black women’s names on this campus. This specifically had to do with her teacher who she has been in a class with for over 7 weeks. She had just finished an assignment and went to turn it in. The teacher says she was blanking on her name and called her Kanika. Her name is Kamryn, she felt that if she was a White student she might have called her Courtney but since she was Black she called her Kanika. Overall, she claims she does not feel safe at Sonoma State University. She feels as if she constantly has a target on her back and she doesn’t know who is going to strike next. This is a serious problem because how can people solve this issue of microaggressions, if the majority does not want

Black Women

to even acknowledge them as existent?

Christen's examples of microaggression and racism really stood out in this study. Her teacher asked her to twerk in front of the class for extra credit. Twerking is a type of dance that involves moving one's low back side that has been associated with women of color. She says, "I'm pretty sure he knows what twerking is, and he offered me extra credit if I would twerk in front of class. And I was like you're kidding right? And he said no." First, this was very inappropriate to talk about while in class. The teacher asking Christen that question was very demeaning, insulting to her academic relevance and only limiting her to only being seen as a hyper-sexualized person. The teacher should have known better than to make that comment in front of the class. Both inside and outside the classroom this would still be an inappropriate discussion to have with a student.

Bria brought up more issues about teachers and microaggressions. She said her peers would say comments, "about certain issues that really rubbed me the wrong way." Most teachers according to Bria, "don't know how to talk about it, which makes it even more awkward, and they don't know how to deal with what the students are saying." Teachers should be able to handle their classrooms when topics and issues of race are brought up and find positive resolutions so that all students can feel safe.

Another aspect that was brought up is how it's very hard to tell unintentional versus intentional microaggressions. Ryan explains, "because we live in a 'post-racial society' or our society kind of makes you feel wrong for wanting to call out microaggressions or discrimination, and so I'm always questioning myself. Like, did this just happen." The fact that teachers don't know how to work out these issues, is a very big problem because in some ways they are condoning microaggressions. Since this is occurring students do not feel safe or right to address these issues in and outside of the classroom.

Irrelation. The second theme is irrelation. This is very prevalent at PWI's and this happens in social and academic settings. These types of institutions are not the most welcoming for people of color, especially Black women. Some ways in which PWIs aren't progressive for Black women are the lack of events and clubs and forcing them to be the spokesperson for their race. Some effects of these institutions makes a researcher wonder: does a PWI high school prepare these women for schools like SSU? Who adjusts better to these schools? Also would these Black women recommend this school to future Black women to attend? All of these concepts fall under the effects of irrelation at a PWI.

When it comes to these women's overall experience, twelve out of fifteen women expressed frustration that there was a lack of events that cater to Black women on this campus. Rebecca says, "I think a lot of clubs are not successful because, umm pertaining to Black women they don't have that support." That's very true because there have been many clubs that have been chartered and then disappeared due to the lack of women involved, funds are not available, inability to get rooms, lack of other students and faculty support. This ties into irrelation

because they are trying to find and create another community for themselves, as Black women and they are still running into issues trying to be a part of the overall campus community.

These women have been hindered with racial responsibilities that have affected their experience. All fifteen interviewees expressed at some point in their college experience that they have had to be the spokesperson for the African American race. Ten women stated that it's awkward, a doubled edged sword, frustrates them, and they feel pressured or simply hate being the spokesperson in a class or social setting. Deborah states, "It kinda irritates me, because I am not the only black person to go to this school. Yes, I have a voice, but I'm not that person to speak up for everyone else. So it's a little frustrating." Not only does this make many students uncomfortable but some teachers do force students to take on this role due to their inability or fear of saying or doing something wrong.

Another aspect of irrelation is not feeling comfortable and welcomed in the overall setting. Ten women agreed that if they attended a predominantly white high school they would have been better prepared for many of the interactions and exclusions that come along with predominantly white colleges. Shy elaborates on this concept, "Definitely...I definitely think that it helps you, because you're used to, like, being around a certain race, and you're used to what comes with it." That was very true for many of these women. If they knew exactly what to expect and that they would be seen as outsiders; it might not have been such a shock for them once they got to SSU.

Since these women know that they do not fit into the overall campus community and that the campus climate is not very welcoming to them. It was very interesting that still nine out of fifteen women said that they would recommend SSU to other Black women. Seven of those fifteen women said under specific circumstances. Cotie explains her reasoning, "I would recommend it to African American women who I know are strong and disciplined ...The weaker ones, I would not, because it takes a lot to be here and stay here." This idea of survival came up in many of these women's interviews. It's a shame and disgrace to the university that these women have to compare their higher education to the concept of survival. Even after everything that these women have been through attending this institution, they still recommended it to other Black women. This occurred because this school prepares Black women for the real world. This school taught these women how to navigate their own way through the school with minimal help and proved that they can be successful without their schools support. Also being around a majority of White students helps prepare these women for their future jobs, where they may not see many other African American colleagues.

When discussing issues of survival, eight of the 15 participants shared that they thought Black men adjusted better at a PWI. Leaving seven of the 15 participants agreeing that it was women that fared better at a PWI. One of the participants, Deborah, argued that this was because, "they adjust more because, you know, we're more focused on our academics, not necessarily on sports and not necessarily on the, you know, extracurricular activities." Kio added that Black men

adjusted better because, “I mean, definitely coming here, obviously the men adjust very well. Cause I mean, I feel like it’s better to be a Black man than it is to be a black woman. Especially here, cause like, all the white girls want them.” These comments suggests that further research might be of need to understand the experiences of Black men at a predominately white female institution. This research can help in understanding if issues such as being deemed worthy or visible for Black women is real and how universities can respond to this, in particular since many of the participants in the study shared that they felt that Black women were deemed not worthy but Black men were because White women liked/wanted them.

Conclusion

Overall, there is much that needs to be done to better Black women’s experiences in higher education in regards to attending a PWI. There are changes that need to be made socially in terms of the campus climate and student interactions. When it comes to academics there is even more that needs to be adjusted to ensure that these women are not being undervalued and excluded. This goes as far as teacher and student relations and connecting to the university.

Socially there is not a lot that Sonoma State has to offer for its Black female students. The majority of these women expressed that there is a lack of events that cater to the Black women on this campus. How does an institution expect its Black students to want to stay and be engaged when there are not any events that cater to this group of students? There needs to more outlets, clubs and organizations for African American women to feel included and safe in. The women brought up the fact that there isn’t a Black sorority established at SSU.

Academically, there are also some changes that need to occur. For starters these women want to see more faculty and professors of African descent on this campus. The course material needs to be more relevant to contemporary Black issues and teach other aspects of African American history going back to Africa before their ancestors were slaves. Also professors should have trainings or classes to deal with race issues that may come up in their classrooms. This could be yearly or bi-yearly workshops that address issues of microaggressions and race interactions in the classroom. It’s unfortunate to say that some teachers do not know how to interact with African American students in their classes. The university needs to find more ways to break these race and gender barriers that are relevant to Black women while getting their college education. Lastly, these women just want more support from professors, staff and the administration in terms of their education and overall experience while attending SSU.

To further the research, another question came to mind: the concept of Black women wanting to be noticed or seen through a colorblind lens. Some women do want to be acknowledged and seen but there are some who do not need to be known as Black women in that particular setting. From the current research it seems that some women are split on this concept but it is worthy of investigation.

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Background Questions:

- 1) How old are you?
- 2) What city are you from?
- 3) What race or ethnicity do you identify?
- 4) What year are you in college?
- 5) What is your major and/or minor in college?
- 6) What is your parents' educational background?

Social Experiences:

- 1) Do you feel ostracized or detached from social or extracurricular activities at SSU? If so can you explain why?
- 2) How are you experiencing microaggression towards you in a social setting? Microaggression refers to these more subtle acts which are either verbal or nonverbal insults by other students.
- 3) Tell me about two experiences within a social club or organizations for Black women on this campus? What can we do about this?
- 4) What are some methods that you use to attend an Institution like SSU? Give examples of groups or influential people.
- 5) Can you list some clubs or organizations that support African American women on this campus? Which ones are you involved in?
- 6) How does the lack of racial structural diversity, which is seeing less people with your racial identity, affect the social campus climate? Do you feel included and safe? How so?
- 7) Would you say in 2014 we have more options and ways to create safe spaces for ourselves as African American women? What are some ways in which you have done this for yourself and or others?
- 8a) Have you experienced racism in social settings at Sonoma? This could be at a party, mixer or just walking through tabling events.
- 8b) Have you experienced sexism at SSU?

- 9) How could the comfort level of Black female students be improved in social settings at Sonoma? Please give some examples like programs or organizations.
- 10) How is a student's social achievement and academic achievements connected? Do you feel that these two concepts work together?
- 11) How do you feel about the majority of White students on campus? Give me an example.
- 12) Do you feel as if attending a more Predominantly White High School helps develop a more comfort level with whites? If so how?
- 13) How does it make you feel when Irrelation occurs to you? This is when an individual or group functions within a social setting without very much relations or connections inside the campus community. Or do you not feel like this occurs to you? Explain.

Academic Questions:

- 1) How has your experience been interacting with faculty at Sonoma? Please explain.
- 2) Explain how you are or aren't connected to your academics due to the course material not reflecting accomplishments, experiences or interests of African Americans? How so?
- 3) In the classroom setting, do you feel like your views or opinions are over-looked or not understood by teachers and peers? If so give an example.
- 4) How does it make you feel when you are delegated to be the "Spokesperson" for your race? Explain and give two examples.
- 5) How have your experiences been with creating relationships with White faculty? Please explain.
- 6) How does it make you feel when students or teachers express Microaggression towards you in a classroom setting? Microaggression refers to these more subtle acts which are either verbal or nonverbal insults.
- 7) Can you list some people that you feel comfortable talking to about academic related issues on campus?
- 8) Looking back on all of your experiences would you recommended this school to other African American women to get their degree(s). Why or why not?

Black Women

9) How can you see relationships (friendships and dating) being an asset or a liabilities to your academic progress?

10) How does academic success correlate to “acting white”? Give some examples of how this can be true or how others see this as true.

Conclusion Questions:

1) Do you feel that African American women adjust better to a PWI than African American males? If so why?

2) How has your perception of yourself changed attending a Predominantly White Institution?

Appendix (B): Table of Participants

Name	Year	Age	Local (Yes/No)	Self-Identification
Rebecca	Junior	20	No	African American
Cheyenne	Senior	21	No	Black
Aliah	Freshman	18	No	African American
Kamryn	Junior	20	No	Black and/or African American
Bria	Junior	20	Yes	African American
Cotie	Junior	20	Yes	Black
Christen	Sophomore	19	No	African American
Deborah	Junior	20	No	Black/African American
Claudia	Senior	21	Yes	Black/African American
Alex	Freshman	19	Yes	African American
Ryan	Senior	22	Yes	Black

Loren	Junior	20	Yes	Black or African American
Shy	Junior	20	No	African American
Rita	Senior	21	Yes	African American, Chinese & Indian
Kio	Senior	22	No	African American

Childhood on Stage: Performing Boy Companies of Elizabethan England

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Abstract

This paper discusses the role of boy-player companies in sixteenth and seventeenth-century England. It further explores the relation between playing companies and changing social attitudes towards children of the period. Other topics discussed include choirboys versus boy actors, recruitment of boys for playing companies, commercialization, impressment, and the famous Clifton case. Through use of various primary and secondary sources, such as court records, annals, and previous scholarly material, this paper argues that rising commercialization of boy companies and impressment reflected Elizabethan English society's shifting perceptions of their children.

Introduction

Companies of child performers, both in choirs and on stage, flourished in Elizabethan and Jacobean England. These boy amateur players grew in importance and popularity throughout the period to become quasi-professional by the early 1600s. As their professionalism grew, so their place on stage changed; what was once a pious service for God transformed into an entertainment business aimed at paying audiences. The short history of these playing companies saw instability, both in terms of high turnover rates of boys and a rise of commercialization. This encouraged infamously dishonorable practices concerning the recruitment of boys, which combined with ensuing reactions, reflected English society's changing attitudes towards impression and treatment of children.

Historiography

Previous scholarly work on the subject appears to be overwhelmingly similar and sometimes almost repetitive. Scholars at the turn of the twentieth century through the 1960s focused their writing on presenting information, rather than on interpretation. In his quest to "find the truth in the history of the children-companies," Charles Wallace's research led him to center on the relations between Queen Elizabeth and one of the most prominent boy-actor companies, the Children of the Chapel (1970, p. xi-xii). His study is notable for his heavy reliance on original sources rather than interpretive publications, as well as on the fact that this early work attempted to shed light on and publish newly discovered material (Wallace,

1970, p. xiv-xv). Harold Hillebrand (1964) stated that his own work was based “chiefly on materials that have been for years in print,” and so does not “lay claim to much originality” in his study of the origins of boy companies (p. 5). Despite this, Hillebrand did “attempt to describe the influence of the boys’ companies on dramatic technique and the peculiar characteristics of children’s plays” (Brettle, 1927, p. 482-484).

Rather than broadly focusing on specific companies and their relation to courtly societies, R.A. Foakes (1962) argued from the standpoint of playwrights creating scripts for child companies. He declared that Elizabethan playwrights, John Marston in particular, “consciously exploit[ed] child actors” through “parody” and “grotesque humor” (Foakes, 1962, p. 232-233). Consequently, Michael Shapiro’s approach was to give a rough overview of the boy companies and their origins, as Hillebrand had done, as well as to explain other areas of boy theatre, such as performance settings, audiences, and actual performances. Like Foakes, Shapiro’s main argument explored the purpose of plays performed by children. Essentially, he ascertained that the purpose of plays was to “support and celebrate social cohesion” while also to “arouse and allay fears of social disintegration” relating to “doubts about individual rank” (Shapiro, 1977, p. 38-39). As evidenced thus far, scholars of the children companies of Renaissance England have focused on relaying and almost reporting information, while making marginal arguments to do with plays, the companies themselves and their relation to the Elizabethan court.

It is only with relatively recent academic studies that the experiences of children, and attitudes towards children within these performing companies, have been brought up and addressed. In her argument against Foakes, Shen Lin (1991) disagreed with his suggestion that the choir actors in Marston’s plays were actually children (p. 122). Through examination of various scholarly works, including Foakes and Hillebrand, as well as various primary source documents, Lin endeavored to offer an understanding about the relevance of children through the performing arts in Elizabethan England. Similar to Lin, Edel Lamb’s (2009) recent work on “performing childhood” addresses the “concept of childhood” and the identity of the child player (p. 2-5). As with Lin and Lamb, my own work will take a similar direction, and focus primarily on the children within these companies of boy performers, rather than on other aspects of the theatre and Church.

A Brief Intro to Boy Companies

There were two main types of boy playing companies in Elizabethan England, choirboys and boy-actors. Troupes of boy actors are commonly understood to have originated in grammar schools, where the curriculum required boys to perform plays to facilitate learning of spoken Latin (Shapiro, 1977, p. 2). Choristers on the other hand, were enrolled in choir schools. These schools were either at private chapels or separate ecclesiastical institutions (Shapiro, 1977, p. 2-7). There was often overlap between both types of schools. For instance, grammar

Childhood on Stage

school boys studied music at the choir school while choirboys received a secular education at the grammar school. In this way, both sets of boys were able to obtain a more comprehensive and thorough education. Shapiro notes the importance of recognizing that they were both distinct and separate schools, as well as distinct and separate players (1977, p. 8). However, I think these two groups of players overlap more than they contrast. Mainly because though they have approached performance differently, their later cohesion at court was dramatically similar.

The most popular troupes at court were the Children of Paul's and the Children of the Chapel. The Children of Paul's was a boy chorister company of St. Paul's Cathedral (Shapiro, 1977, p. 1). They were originally housed in the almonry and were supervised by a choirmaster (Shapiro, 1977, p. 8). In comparison, Children of the Chapel also started out as a chorister company (Wallace, 1970, p. 1-2). However, they are best known as a boy-acting troupe, especially when they began to "[extend] their theatrical activities" (Shapiro, 1977, p. 7).

There were a few avenues from which to recruit young boys for playing companies. Families voluntarily offering their children for education was one option, orphanages were another. Boys were considered "orphans" if they were without a father (Kathman, 2010, p. 347-348). However, presumably not all boys without fathers were placed in an orphanage if their mother or other relatives could look after them. Christ Hospital was a "city-run orphanage and school... founded in 1552" (Kathman, 2010, p. 347). Their meticulous records evidence such patriarchal penchants, where only fathers' death dates are listed (Kathman, 2010, p. 347). For instance, John Pratte lost his father extremely young, for he was admitted to Christ's Hospital as a "three-month old infant" (Kathman, 2010, p. 347). He went to serve in Children of the Chapel, under Richard Farrant, in April 1579 when he was about twelve years old (Kathman, 2010, p. 347). Adopting boys from orphanages and families volunteering younger sons were not the only roads to recruitment. There was also the option of impressment, the abduction and enforcement of boys into these playing companies. Impressment continued through increased court performances, which opened the "gateway to... commercialization of the children's troupes" (Shapiro, 1977, p. 5). The practice of impressment was both severely affected by this phenomenon and at the same time an incentive to continue.

About Impressment. Impressment of young boys for performing child companies was rampant in England from the fifteenth through seventeenth centuries. The earliest record of a kidnapping for the Chapel Royal occurred under the reign of King Henry V (1413-22), on January 14, 1419 (Grattan-Flood, 1916, p. 466). A clerk by the name of John Pyamour was ordered to commandeer "suitable" boys for the chapel (Grattan-Flood, 1916, p. 466). In this case, 'suitable boys' were of course those who could sing. They were boys with the unfortunate gift of musicality. It is yet unclear how Pyamour and other kidnapers knew which children could sing and which could not. Nevertheless, it is apparent that boys were indeed taken.

Another commission was issued on July 12, 1440 under the reign of

King Henry VI (1422-61). This order was for the Dean of the Chapel Royal, John Croucher, who was ordered to abduct as many able-bodied singing boys as he possibly could (Grattan-Flood, 1916, p. 466). Additional commissions for impressing boys were issued in 1456 and 1484, both to the successive Masters of the Children (Grattan-Flood, 1916, p. 466). Undoubtedly then, impressment was a highly common practice. It was a practice of capturing and forcing boys into public service, a practice allowed and encouraged by the reigning monarch. Public service being the chapel choir, this indicates just how significant the choir was to fifteenth and sixteenth-century England. What's more, even English royalty were enamored with this system of child exploitation. After all, it met their higher need for holy voices. How those voices were procured was apparently not nearly as important as that they *were* procured.

Demand for boy choristers continued throughout the sixteenth century as well, despite claims that the practice fell into disuse (Grattan-Flood, 1916, p. 466). While W. H. Grattan-Flood did not list explicit reasons for such a statement, I presume that such claims were made in accordance with available sources, that there might have been a relative lack of such sources during Elizabeth's reign in comparison to her predecessors. Subsequently, that alone could inspire some scholars to claim a decline of impressment during the sixteenth and early seventeenth centuries. However, Grattan-Flood did note several commissions during this time, including one in February 1550 to Philip van Wilder. Grattan-Flood (1916) also noted warrants issued on June 6, 1552 to Richard Bower, and another in 1566 to William Hunnis (p. 466). Therefore, it is unlikely that impressment of boys truly declined. Queen Elizabeth herself had been granting commissions, such as the following excerpt from 1585 to Master of the Children at St. Paul's, Thomas Giles:

Whereas we have authorized our servant Thomas Gyles... to take up suche... children as are most fit to be instructed and framed in the arte and science of Musicke and singing, as may be had and founde out within any place of this realm of England or Wales.
(Silburn, 1920, p. 562).

This commission authorized the stealing of young boys who were most "fit" for choir service. It is interesting that this passage does not define children by class. Theoretically then, children could be taken from any class, as long as they had musical talent. Thus, class would have played an interesting role in recruitment of choristers. Regardless, commissions and royal warrants are major sources that demonstrate continued impressment practices during Elizabethan England. As evidenced by yet another commission to impress children granted to Nathaniel Giles in 1597, in which Giles was given the power "to take any such and so many children as he... shall think meet... as well within the liberty as without this our realm of England whatsoever they may be..." (Wickham, 2000, p. 263). Again, commissions for impressing boys do not appear to have declined during Elizabeth's reign.

In addition to royal warrants and patents, there are also Privy Council

Childhood on Stage

records of stolen boys. For instance, on December 3rd 1575, a boy was stolen from the Children of St. Paul's, a popular choir company under the leadership of Sebastian Westcotte. Privy Council records note: "one of Sebatsianes boyes, being one of his principal plaiers, is lately stolen and conveyed from him" (Dasent, 1894, p. 86). Evidently, young boys were not only kidnapped and impressed into playing, but they were also stolen from other companies, stolen from one company and impressed into another. Certainly some boys were more talented than others, seeing as the boy stolen above was a "principal plaier" (Dasent, 1894, p. 56). As such, he was probably cast in many lead singing and acting roles, and was therefore more valuable. Additionally, Sebastian Westcotte and other Masters of the Children must have cared enough about their boys to report them stolen, instead of just recruiting another boy off the street. This is especially true in the case of more esteemed and talented boys, such as with Westcotte's principal player, but also with Solomon Pavy.

Pavy was reportedly stolen from another company in 1600 (Wickham, 2000, p. 265). The child had been apprenticed to "Peerce," who some scholars attribute to be Edward Pierce, Master of the Children of Paul's, thereby implying that perhaps Pavy used to belong to the Children of Paul's. However, by 1600 he came into Children of the Chapel by means of impressment (Nungezer, 1929, p. 267-268). Therefore, as with Westcotte's boy in 1575 and Pavy in 1600, children were not just impressed from orphanages and off the streets, they were stolen from rival companies as well. Competition between rival companies was a powerful force driven by desired affections from the Queen, which in turn initiated the rise of commercialization.

Concerning Commercialization & Impressment. By the late sixteenth and early seventeenth centuries, a link had emerged between impressment and rising commercialization. This link originated from the main cause of impressment, demand for choirboys. That demand then fed growing commercialization. As discussed above, demand developed from monarchial "need," but also from a high turnover rate of boy players, which contributed to the need for continual recruitment (Lin, 1991, p. 125). This in turn resulted from various reasons of a boy's leaving the company. Namely, such reasons included early death, age, and of course, impressment. Further, it was this conglomeration of demand, high turnover rates, and commercialization that transformed impressment.

Although the wealthy also experienced high child mortality, early death of a choirboy was likely caused by unhealthy and impoverished living conditions. For instance, though Thomas Tusser did not die as a young chorister, he was "scantily fed and often beaten" (Bradbrook, 1961, p. 56). Tusser's (1812) experiences of abuse can be seen from his book *Five Hundred Points of Good Husbandry*, in which he describes the frustration of living off of stale bread, threadbare clothing, and various beatings (p. 315). There was also the case of Salomon (Salathiel) Pavy, child star among the choristers and among the Chapel Children (Johnson, 1954, p. 77). He died at age thirteen in 1603 of unknown causes (Lin, 1991, p. 124). His

death is given much attention in Ben Johnson's "Epitaph on S.P. A Child of Q. El. Chappel," where "S.P." is assumed to be Salomon Pavy. What was most interesting about Johnson's presentation of Pavy is how the boy's death was treated as a great loss of both a child and of possibility (Johnson, 1954, p. 77). Johnson's elegy also suggests that Pavy was quite prominent among child actors and that there was a close association between child actor and playwright. Moreover, Pavy's death is just one example, an extremely famous example, of early childhood death.

Unlike practices in Italy, English choirboys were not castrated. Therefore, their voices were allowed to grow to maturity. Naturally, boys with broken voices could no longer participate in the choir. Sometimes though, it was possible to temporarily hide a breaking, and therefore, to keep such a boy in the choir for longer than was normal. This was especially true if the boy was talented. Sebastian Westcotte's will lists the names of several boys who were kept behind, possibly because they had good voices and probably to work as musicians or play major roles (Lin, 1991, p. 126).

Of the boys who were not kept behind, some of them went on to music school or apprenticeships, such as John Blow, William Turner, and Henry Purcell (Nicholson, 1943, p. 65). The famed composer Thomas Ravenscroft also served as a choirboy in his youth under then Master of the Children of Paul's, Edward Pearce (Austern, 1985, p. 245). As with Ravenscroft and others then, many went on to music-related careers such as musicians, composers or even masters of the children themselves. The song school was therefore considered a great education for those who could make something of it.

High demand and rising commercial considerations also accounted for impressment of children. Increasing commercialization is evidenced by increased desire for court performances, which became popular for the benefits they provided choirmasters, that being financial gain and an esteemed reputation (Shapiro, 1977, p. 21). To garner a wider audience, choirmasters began opening their own private theatres, such as Evans and the Blackfriars playhouse in 1600 (Forse, 1990, p. 165). Along with this, there was also an "increased mention of fees" (Shapiro, 1977, p. 21). Increased fees included charges for costumes, repairs to the theatre, rents, bonds, playwright fees, and "gifts" to court (Forse, 1990, p. 168-169). Such "gifts" bought friends and favors at court, and a blind eye from law enforcement, hence their immense importance (Forse, 1990, p. 168-169). Therefore, buying off the court and paying the basic necessary fees to keep an illegally open theatre up and running and in fairly decent shape was extremely costly. Further costs included child support for housing, food, and clothing as well as lessons in music, manners, and grammar, and also dues to keep older boys who may have stayed on, as well as servants for domestic work (Forse, 1990, p. 169-170). Choirmasters found it difficult to keep up with these and other noted expenses under Elizabeth's stingy allowances (Forse, 1990, p. 171). As a result, they came up with new methods to help pay for their incurring fees.

Through commercialization and competition between companies, impressment evolved into a possible solution to help alleviate increasing expenses,

Childhood on Stage

that being impressment for ransom and therefore, misuse of the patent system. Likewise, misuse of power was common in Renaissance England. In fact, Elizabethan subjects were very used to “fees, bribes, and “pourboices”” (Forse, 1990, 171). Additionally, Elizabethans were used to all kinds of control controversies and criminal deeds, such as burglaries, schemes for burning buildings, and rumors of the Queen’s death (Harrison, 1955, p. 282-292). Therefore, it is understandable how that kind of environment and mindset could twist an authoritative grant into a mechanism for personal profit. The idea behind impressing boys for ransom was that wealthy fathers would pay a significant sum to have their children back. This would turn impressment into a business of stealing boys for financial gain. Except of course, not everyone would put up with such behavior. In the famous Clifton case, young Thomas Clifton was stolen off the streets and impressed into the Children of the Chapel. Henry Clifton, his father and one of the local Norfolk elite, would not stand for such atrocity (Wickham, 2000, p. 265). The Clifton case is a prime example of the underlying theme of shifting perceptions and attitudes towards Elizabethan children.

Clifton Case. On the 13th of December 1603, thirteen-year-old Thomas Clifton was walking to school when, “with great force and violence” he was seized and kidnapped by James Robinson (Wickham, 2000, p. 265). Robinson was working under the supervision of Henry Evans and Nathaniel Giles, current choirmasters of the Children of the Chapel at Blackfriars in 1600. In Henry Clifton’s complaint to the Queen and Privy Council, he stated that Thomas “had no manner of sign in song nor skill in music” to be useful to Giles and Evans (Wickham, 2000, p. 265). Further, Thomas was already thirteen years old when taken, so his voice must have been changing. As an adolescent with no musical skill, he could not have been taken for acting and singing purposes, but for ransom (Wickham, 2000, p. 265).

Clifton had gone immediately to the playhouse to demand his boy be released and given back to him, but he was refused (Wickham, 2000, p. 265). Evans and Giles brushed him off as if he were no more than a common housefly. Clifton again demanded the release of his son, stating that he would make a formal complaint to the Privy Council if Evans and Giles refused this second time. He said it “was not fit that a gentlemen of this sort should have his son and heir (and that his only son) to be so basely used” (Wickham, 2000, p. 266). Not only was it dishonorable to take a man’s son away from him, especially an only son, it was dishonorable because Clifton was of a higher class.

Still, Evans and Giles refused. In response to Clifton’s demands, they very arrogantly replied that they had the “authority... to take any nobleman’s son in this land” (Wickham, 2000, p. 266). The complacency towards Clifton stemmed from Giles’ possession of a commission issued under the Queen’s Privy Seal and of a patent issued under the Great Seal (Forse, 1990, p. 173). They had “legal grants of authority” and so felt protected by the crown in the face of Clifton’s requests

for the release of his boy (Forse, 1990, p. 173). Evans and Giles were under the impression, or so they claimed, that they had the right to take whichever boy they chose for impressment in their company. As such, this air of entitlement went so far that the choirmasters threatened Thomas in front of his father, as an attempt to push Clifton to give in and pay up for his son. They pulled young Thomas into the room, handed him a “scroll of paper containing part of one of their plays...” and commanded him, in front of his father’s eyes, to learn it by heart, and “if he did not obey...” then he would be whipped (Wickham, 2000, p. 266). This encounter is symbolically important because only a person of authority had the right to have another person whipped. Therefore, Evans and Giles were dramatically challenging Clifton’s authority over his son.

James Forse (1990) supposes that this was a ploy meant to upset Clifton to the point of breaking (p. 172-173). Except that Clifton did nothing of the sort. It is possible Clifton was completely unaware of the hints at bribery, since he was from Norfolk and therefore outside the main hub of London. However, it is more likely that he was downright furious that his son was taken from him. Furious that Evens and Giles refused to give the child back, and more, that the choirmasters had the gall to threaten his son with violence, to force the boy to memorize the part of a play against his will (Forse, 1990, p. 172-173). Clifton never paid a shilling but went straight to Sir John Fortescue, a friend and member of the Privy Council (Nungezer, 1929, 94). Through Fortescue’s order, Thomas was “released within twenty-four hours” after capture (Nungezer, 1929, 94).

Obviously, stealing boys for ransom did not always work out as planned. Especially not when faced against those with powerful connections, such as Henry Clifton. He submitted his complaint to the Privy Council a year after his son’s impressment (Forse, 1990, p. 174). That he submitted a formal complaint at all speaks volumes about his views and status, and assumingly other fathers’ and guardians’ views, of their children in this period; mainly, that children were important to their fathers, important enough to care about their well being and their futures. Clifton’s complaint includes many statements about “great terror and hurt,” as well as “abuse and oppression” in regards to the company’s treatment of his son (Wickham, 2000, p. 265-266). It can be said that Clifton was completely disgusted and repulsed by such exploitation, especially when it concerned his child. As with Thomas Tusser, now with Thomas Clifton and others, playing companies’ mistreatment of children appears to be quite common. Which would partly explain the condemnation of stage careers by elite parents, such as Clifton.

Henry Clifton was unnerved with the idea of his son being “employed in that vile and base manner of a mercenary player in that place” (Wickham, 2000, p. 266). As someone of elite status, Clifton very strongly disapproves of his son becoming, of all things, a simple player. He had higher ideals for his son’s future employment prospects. In addition to the question of reputation and economic prospects, there is also the issue of treatment. Clearly, child players suffered abuse and even violence. They did not always lead happy lives. To Clifton then, the thought of his son working as an actor on stage was not just repugnant in terms of

Childhood on Stage

his son's treatment, it was also degrading, demoralizing even, that his son would ever be in such a scandalous position. Especially when, as a child of high status, he had the chance to be something more. It was not just Clifton's boy that was stolen though, for he lists the names of seven other boys who were "in no way able or fit for singing" and who were taken from their schools, employers, and apprenticeships (Wickham, 2000, p. 265). This did not legitimize the stealing of non-singing boys, but it is proof that Clifton's boy was not the only one taken. Thus, Clifton was not just arguing for himself, he was making a case for all who suffered in that way by Evans, Giles, and Robinson. The abuse of these boys was also abuse of royal patents, the purpose of which was supposed to be used only for the obtainment of children to service in choirs, not for abduction and ransom.

The early 1600s saw Elizabethan subjects becoming "fed up with abuses of royal patents" (Forse, 1990, p. 174-175). I argue that this feeling of disgust and being "fed up" also applies, in part, to the treatment of children. That the misuse of these royal patents to impress children into companies for the sole purpose of ransoming them had so exasperated Elizabethan-Jacobean English society that it became scandalous and important, as evidenced by Clifton's complaint. Additionally, such exasperation did not make headway until a child of higher class had been taken. Therefore, and to a certain extent, class and social standing do play a sizable role in English society's changing attitudes of their children.

New Rules. The same year that Henry Clifton filed his complaint against Evans and the Chapel Children also saw a new edict from the Privy Council. This order suppressed all plays during Lent in 1601, especially those at Paul's and Blackfriars (Bradbrook, 1961, p. 55). Church officials viewed plays and stage comedies to be highly unseemly for performances by pious children (Bradbrook, 1961, p. 55). In addition, the English Church and state in the sixteenth and seventeenth centuries were very closely tied. Therefore, it is reasonable to assume a direct connection between religious scruples of the Church and public government ordinances, both of which directly influenced English society. Although the 1601 edict did not directly concern Clifton's case, the edict is still significant due to the negative political and religious views of boy companies, that children were performing such crude secular works. It is even more important because those views were enforced on the public. Also, whether or not it was coincidence, Clifton and the Church were clearly in agreement in their opinions of the stage playing business. That it was an unseemly and uncouth institution not fit for virtuous children.

Two years after the 1601 ordinance and Clifton's complaint had passed, the renowned child star Solomon Pavy suffered an early death. As briefly discussed earlier, Ben Johnson dedicated an epitaph to the boy, the opening of which reads:

"Weepe with me all you that read
This little storie:
And know, for whom a teare you shed,
Death's selfe is sorry.

‘Twas a child...’ (Johnson, 1954, p. 77).

In the very first few lines there is an immediate sense of loss and tragedy at the loss of this child (Johnson, 1954, p. 77). The attention Johnson focuses on Pavy’s identity as a child, and less as an actor, is greatly significant in portraying social attitudes towards children in the early 1600s. By emphasizing the loss of a child, Johnson’s epitaph reveals that at least a portion of English society did view children differently. Johnson does lament the boy’s talents on stage, though. He explains how Pavy had been a talented player for three years as part of the Chapel Children, before his untimely death (Johnson, 1954, p. 77). Johnson then goes on to say how Pavy was “much too good for this earth,” perhaps inferring that the child was too pure and innocent for the harsh realities of his world. As such, Johnson wrote a touching piece about the loss of a young boy, a talented player yes, but a child first.

Twenty years later, there were new rules on the conditions of child impressment. A commission issued in 1626 states:

...that none of the said choristers or Children of the Chappell, so to be taken by force of this Commission, shall be used or imployed as Comedians, or Stage Players, or to exercise or acte any Stage Plaies, Interludes, Comedies or Tragedies; for that it is not fit or decent that such as should sing the praises of God Almighty should be trained or imployed in such lascivious and prophane exercises. (Rimbault, 1966, p. viii-ix).

Clearly, repeated themes abound from the 1601 ordinance above. Chorister children are strictly prohibited from performing in “lascivious and profane” plays. However, where the edict was concerned with prohibiting plays during Lent, the commission was more concerned with tackling the problem at its heart. It stated that choirboys were no longer permitted to perform plays at all, not just during religious observances. Additionally, the commission had specifically mentioned the Children of the Chapel in that forbidden group, the same company that Thomas Clifton was forced into. The commission is noteworthy on account of the new restriction on impressment practices and on account of specific attention to the Chapel Children. However gradual, it seems that a noticeable shift has been made – a shift in favor of the choir children.

It was not until the mid-seventeenth century that a true change is discernible in English attitudes towards children. For in 1645, an ordinance was issued by the “Lords and Commons assembled in Parliament” that states:

Whereas the houses of parliament are informed, that divers lewd persons do go up and down the City of London, and elsewhere, and in the most barbarous and wicked manner steal away many little children...

It is ordered by the Lords and Commons in Parliament assembled,

Childhood on Stage

that all officers and ministers of justice be hereby... required to be very diligent in apprehending all such persons as are faulty in this kind, either in stealing, telling, buying, inveigling, purloining, conveying, or receiving Children... and to keep them in late imprisonment, till they may be brought to severe and exemplary punishment (Parliament, 1644).

Understandably, a direct order against the stealing and selling of children is extremely significant, especially since it was issued during Puritan rule. Puritan values are referenced in all manner of laws and ordinances of the 1640s and 1650s. That the Privy Council published an ordinance against stealing and selling children reflects society's already changing attitudes, including that of child impressment. It does not mean that impressment stops at this time, as with past edicts and commissions, and as it did not stop with Clifton's complaint. However, it is a significant contribution towards shifting attitudes about children. It is also significant in shifting perceptions on treatment of children. What's more, it stipulates that criminals will not be tolerated. That "all persons involved" in such acts will face "imprisonment" and "severe and exemplary punishment" plainly defines the consequences for abductors of children (Parliament, 1644).

As of 1645, stealing children was now publically considered "barbarous and wicked," particularly concerning "little children" who were kidnapped (Parliament, 1644). Publically announcing views of barbarity, wickedness and brutality in the treatment of children is momentous in demonstrating shifting attitudes in society. It was no longer just elite fathers like Henry Clifton complaining to the Privy Council that something must be done, that stealing children was not right, because the English government had officially and publically thrown its lot in with Puritan values. Further, the length Parliament went to ensure that people knew how "careful" they were to "prevent such mischiefs" is of particular interest (Parliament, 1644). They made sure that their audience was aware of just how much they "detest a crime of such villainy" (Parliament, 1644). It is as if they wanted to be absolutely certain that English society would have no doubt as to which side they were on, whom they were supporting, and that they were truly concerned with the plight of sold and stolen children. By publishing this ordinance, Parliament had taken a very public and substantial step in aiding the plight of kidnapped and impressed children.

Conclusion

Boy companies went through a business transformation in the sixteenth and seventeenth centuries. Where at first, these troupes of boy actors and choristers performed in grammar schools, in churches and monasteries, their frequency at court became increasingly significant and ever more popular. The promise of a court performance held other possibilities, such as recognition from the Queen, increased status and reputation of the performing company, and most of all, monetary gain. The increased desire for economic gain via court performances was the

beginning of the commercialization process. Other steps comprised choirmasters acquiring their own public playhouses, thereby increasing the already high expenses. However, commercialization was not enough to keep up with rising costs, especially not when those costs related to the high turnover rate of boy players. To alleviate this problem, choirmasters impressed more children than they needed, including some who were impressed for ransom.

That parents would care enough to buy their children back is one thing, but it is another when parents file a complaint about the abduction of not just their children, but others as well. Henry Clifton did just that when his son Thomas was kidnapped. Upon the release of his son, he later filed a complaint against those who stole the boy, mentioning seven other stolen children who were also stolen and who also lacked musical talent. Clifton argued for the release of his son, but also for the scandalous injustice of child impressment in general. Following the Clifton case, there were numerous ordinances and commissions issued by the Church and the Privy Council that deliberately leant toward the protection of children. Children could not perform in plays during Lent, children should not be forced to perform in plays at all, and finally, children should not be stolen. Clearly, there was an increasing value of children and a change of attitude, in which parents, the Privy Council, and the Church took part in. Children were exploited, stolen, and forced into these playing companies, but through the effort of parents, of the government, and ecclesiastical institutions, there began a movement for change.

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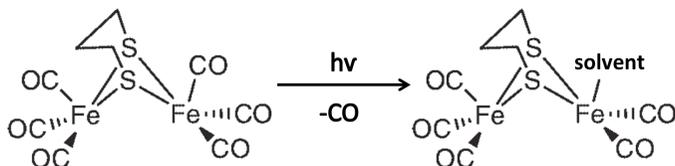
Quantification of a Photochemical Carbon Monoxide Releasing Molecule (PhotoCORM) Using a Binuclear Rhodium(II) Complex.

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Research Mentor: Carmen Works, Ph.D.

Introduction

Carbon monoxide (CO) is best known as a silent killer because it is tasteless, odorless, and colorless. However, it is also recognized as a small molecule signaling agent produced through heme catabolism which is catalyzed by heme oxygenase (Mann & Motterlini, 2007). There are two isozymes of heme oxygenase (HO) known as HO-1 and HO-2. HO-1 is an inducible enzyme in response to oxidative stress while HO-2 is expressed under homeostatic conditions, and both generate CO in vivo (Mann & Motterlini, 2007). Research has shown that CO plays a therapeutic role in the promotion of wound healing and reduce the risk of organ transplant rejection. (Romao, Blättler, Seixas & Bernardes, 2012). Current therapeutic methods use direct inhalation of CO gas, which presents a risk of asphyxiation. Our research efforts are directed toward developing molecules that are capable of specific CO delivery to biological targets for both therapeutic use and toward elucidating the biological chemistry of CO. Photochemical carbon monoxide releasing molecules (PhotoCORMs) have the potential for achieving a safe and controlled delivery of CO to specific targets (Rimmer, Pierri, & Ford, 2012). Iron-Iron Hydrogenase model compounds show promise as potential PhotoCORMs. The generalized molecular structure of these compounds contains iron, sulfur and multiple COs (μ -pdt-[Fe(CO)₃]₂), and provides a platform for synthetic modifications, which allow chemical refinement for biological delivery (Scheme 1). Current methods for the detection of CO from Photo and Thermal CORMs have been limited and problematic, so to help quantitate the amount of CO released from both type of CORM's, we are employing a binuclear rhodium(II) compound, $[\text{Rh}_2 \{(\text{C}_6\text{H}_4)\text{P}(\text{C}_6\text{H}_5)_2\}_2]$



Scheme 1: Release of CO upon irradiation of μ -pdt-[Fe(CO)₃]₂ to form a solvento spe-

$(\text{O}_2\text{CCH}_3)_2 \cdot (\text{CH}_3\text{CO}_2\text{H})_2$ that has previously been shown to bind CO (Esteban, 2008). Experiments used standard actinometry to determine the power of our

light source at 365-nm and irradiation of solutions containing μ -pdt-[Fe(CO)₃]₂ or a mixture of the rhodium(II) complex and μ -pdt-[Fe(CO)₃]₂. Spectral changes in the optical spectra of both μ -pdt-[Fe(CO)₃]₂ and binuclear rhodium(II) were used to calculate the moles of CO produced per moles of photons absorbed (quantum yields). These experiments will ultimately help maximize total moles of CO delivered from these types of PhotoCORMs.

Methods

Synthesis of Rhodium(II) Complex

Prior to reflux, all glassware was dried in an oven for an hour. Additionally toluene/acetic acid (5:1) were purged with nitrogen for twenty minutes. The reaction was performed under inert atmosphere using standard schlenk line techniques. Synthesis procedures were followed by adding 25 mg of rhodium(II) acetate dimer and 27 mg of triphenylphosphine in a three neck round bottom flask. (Esteban, 2008; Moragues, 2011). A 2:1 molar ratio of phosphine to rhodium(II) was used. A gentle reflux for three hours was performed and the solvent was evaporated off by reduced pressure. The remaining sample was chromatographed using methylene chloride/hexane (1:1). Once separation of the blue band was visible, the mobile phase was increased to (2:1) methylene chloride/hexane solution. The purple layer was collected and removal of solvent was done by a rotary evaporator. The sample was dissolved in a minimum amount of acetic acid/methylene chloride (1:10) and purple crystals were isolated after recrystallization from chilled hexane.

Actinometry

Standard actinometric procedures were performed with 0.012M potassium ferrioxalate solution, 0.5 M phenanthroline, and a 0.5 acetate buffer (Calvert & Pitts., 1996). 2 mL of acetate buffer and 1 mL of 1,10-phenanthroline was added into a 10 mL volumetric flask. While stirring, 3 mL ferrioxalate solution is irradiated in a quartz cuvette for 30 seconds at 365 nm wavelength. To the volumetric flask containing acetate buffer and 1,10-phenanthroline, 2 mL of the irradiated solution was pipetted in. Distilled water was added to bring the total volume up to 10 mL. This was repeated four more times but on the fifth repetition, the ferrioxalate solution was not irradiated but instead 2 mL was directly transferred to the volumetric flask. This is done to serve as a blank. Solutions were covered with foil and left in the dark to develop for an hour. Absorbances were checked at 510 nm ($\epsilon = 1.11 \times 10^4 \text{ M}^{-1} \text{ cm}^{-1}$).

Quantum Yield Determination of μ -pdt-[Fe(CO)₃]₂ and Rhodium

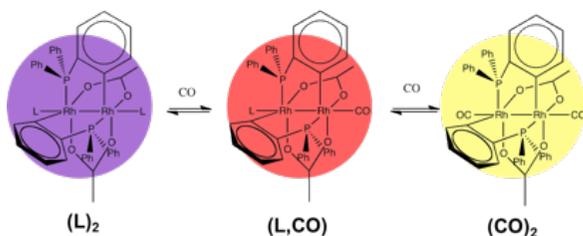
Dissolved μ -pdt-[Fe(CO)₃]₂, which was previously synthesized, in a 25 mL volumetric flask with methylene chloride (Works, 2007). From the stock solution,

PhotoCORM

3 mL of $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ was transferred into a quartz cuvette and absorbance was checked at 325 nm ($\epsilon = 1.3 \times 10^4 \text{ M}^{-1}\text{cm}^{-1}$). Rhodium crystals were added until the absorbance was about 0.3-0.4 nm ($\lambda_{\text{max}} = 567$, $\epsilon = 552 \text{ M}^{-1}\text{cm}^{-1}$). The solution of $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ and rhodium complex was irradiated for 30 seconds using 365 nm band pass filter and a Hg-Arc lamp. Absorbances were checked after each irradiation and repeated irradiations were performed until there was no change. Quantum yields were calculated for moles of CO loss in $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ per photon absorbed and moles of CO gained for rhodium(II) dimer per photon absorbed.

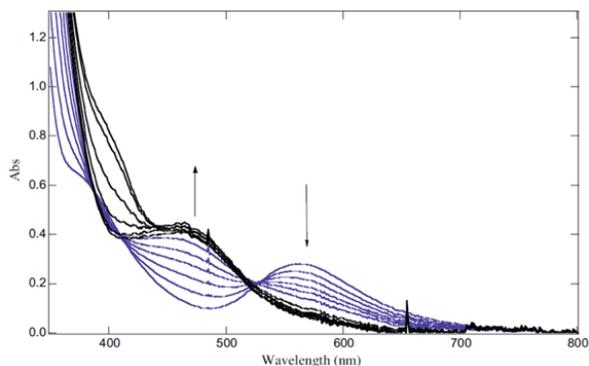
Results & Discussion

In order to potentially manufacture this PhotoCORM as a drug in the future, efforts must be made to quantify the amount of CO release. Since a myoglobin assay is sensitive to oxidation and calculating quantum yields based on the detection of such low amounts of CO in the IR gas cell was problematic, we've employed a binuclear rhodium(II) compound to detect CO in solution. As shown in scheme 2, this compound contains two ortho-metalated phosphine ligands and two labile axial sites that are replaced through the binding of CO. When no CO ligands are bound, the color remains purple. With addition of CO at one ligand site, the color changes to red. Lastly, full occupancy of CO at the axial ligand site results in the color change to yellow.



Scheme 2: Reaction of binuclear rhodium(II) complex with CO, where L is acetate ligands.

Figure 1: Change in absorbance of binuclear rhodium(II) complex with 100 μL injections of saturated CO in dichloromethane.



In addition to being a colorimetric detector, this rhodium complex has shown to be highly selective to CO with a remarkably low detection limit. This can be seen in figure 1 when rhodium underwent absorbance changes when exposed to 100 μL injections of dichloromethane fully saturated with CO. The band at 465 nm begins to appear, which is indicative of the (L,CO) complex. Finally, the appearance of the new band at 398 nm indicative of two CO's binding is observed.

PDT	Rhodium
0.17	0.13
0.16	0.11
0.13	0.09
0.15	0.10

Wavelength	Quantum Yield
365	0.18 ± 0.07

Figure 2: Changes in absorbance in $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ and the rhodium(II) compound during irradiation for 30 seconds using 365 nm band pass filter and a Hg-Arc lamp.

radiation for 30 seconds, peaks at 325 nm and 567 nm begin to decrease while the peak at 465 increases.

This is symbolic of photo release of CO from $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ at 325 nm and capture of CO by binuclear rhodium(II) complex at 567. The increase of absorbance at 465 nm is indicative of the (L,CO) species forming. Again, the isosbestic point at 525 nm is present which is representative of (L)₂ forming (L,CO) with only these two species existing in solution. Quantum yields were calculated from these changes in absorbance in $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ and the rhodium(II) compound (Table 1). Previous calculations done at 365 nm wavelength determined an average of 0.18 ± 0.07 for quantum yields of $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$. In Table 1, the pdt column represents the quantum yields calculated in this study. These numbers are within experimental error and demonstrate reproducibility. The quantum yields for CO capture by rhodium are also very similar to the calculated quantum yields for $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$. These photochemical changes further confirm that the changes observed in the UV-Vis are due to loss of CO upon irradiation and capture of CO by the binuclear rhodium compound. This further indicates that the binuclear rhodium(II) complex is able to detect CO at very low concentrations with specificity to CO.

Two isosbestic points at 525 nm and 410 nm are seen when increasing the concentration of CO. These isosbestic points are evidence only two species are present and that the y shift in equilibrium when additional CO is added. Since this system is able to detect CO at low concentrations, an experiment was conducted to test the efficiency of CO capture by the rhodium(II) complex upon release of CO from $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ (Figure 2). The peak at 325 nm is the $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ compound that was only present in the dichloromethane solution. The peak at 567 nm represents the rhodium(II) complex and $\mu\text{-pdt-}[\text{Fe}(\text{CO})_3]_2$ compound present in the dichloromethane solution. Upon each ir-

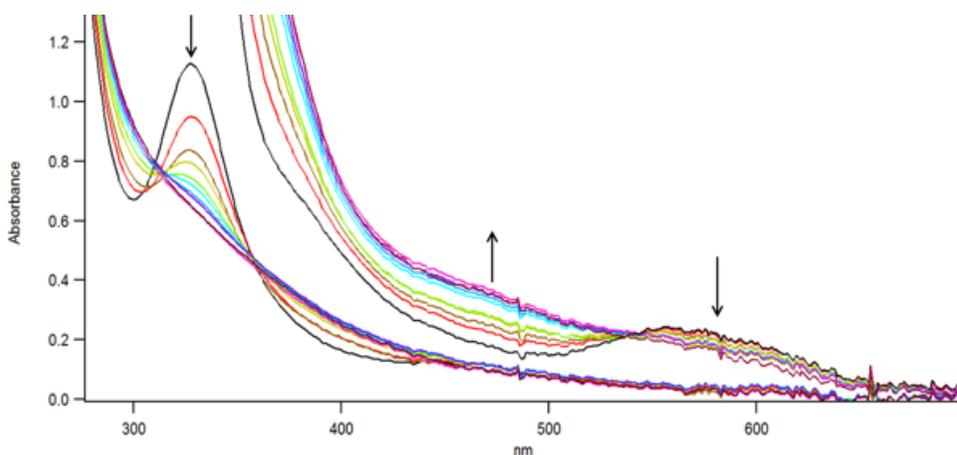


Table 1: Quantum yields for μ -pdt- $[\text{Fe}(\text{CO})_3]_2$ and binuclear rhodium(II) complex.

Conclusion

Carbon monoxide produced *in vivo* has shown to contain various therapeutic aspects and because of this, efforts are being directed to developing drugs that release CO photochemically. PhotoCORMs have the potential for achieving a safe and controlled delivery of CO to specific targets. μ -pdt- $[\text{Fe}(\text{CO})_3]_2$ contains an diiron metal center with two sulfur bridging ligands and was the compound being tested in this study. Due to the fact that current CO detectors became problematic in detecting low amounts of CO in solution, we've employed a binuclear rhodium(II) compound in order to alleviate this issue. We were able to demonstrate the efficiency of CO capture by the rhodium compound from CO release by pdt- $[\text{Fe}(\text{CO})_3]_2$ upon irradiation. Further work will be directed towards developing a water soluble form of the rhodium(II) complex to be used during both *in vitro* and *in vitro* studies.

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Behavioral Enrichment: Assessing the Well-Being of Zoo Living Mandrills

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Abstract

Captive primates are psychologically and behaviorally enriched when there is a balance between positive and negative aspects of their core behavioral needs (exerting control, acquiring rewards, and investigating). When these core needs are not being met, it is hypothesized that they can be improved through behavioral enrichment. Here, I present data that was gathered in an effort to assess the well-being of a zoo-living group of mandrills (*Mandrillus sphinx*). Data were collected between August-December 2014, totaling over 100 hours. I employed continuous focal-animal sampling in which observations were 30 minutes in length. The results of my analysis suggest that the study subjects' behavioral needs are indeed out of balance, with negative investigating behavior accounting for 35 % of their daily activity. In fact, the study subjects spend a large proportion of their activity budgets being inactive. As such, these data indicate that the well-being of this group of mandrills can be improved by employing a behavioral enrichment that is aimed at reducing negative investigating behavior (i.e., inactivity).

Introduction

The well-being of primates has been extensively researched in laboratory settings (Beauchamp Ferdowsian, & Gluck, 2014; Ward et al., 2012). Zoo-living primates, in turn, have received far less attention from primatologists (Melfi, 2005). Compelled by mounting evidence about the cognitive capacities of various primates (Brosnan & de Waal, 2002) however, there is now a push to re-evaluate the well-being of all captive primate species (Gluck, 2014). Such studies have indicated, for example, that some primate species have theory of mind (Call & Tomasello, 2008), demonstrate self-awareness (Anderson & Gallup, 2011), succumb to depression (Xu et al., 2014), and exhibit empathy (Preston & de Wall, 2000; de Waal, 2008). Since their social environment is complex (Koenig et al., 2013), primates have also evolved neurobiological adaptations to live in social groups (Chang et al., 2013). As Dunbar (1992) suggests, the size of the neocortex of a given primate species is a robust predictor of group size (Dunbar, 1998), and in some studies, social cognition (Bryne & Corp, 2004). Because mandrills (*M. sphinx*) form the largest aggregate social groups ever observed (Rogers et al., 1996; Abernathy et al., 2002), ensuring they are psychologically and behaviorally enriched while living in captivity should be considered of great importance. Unfortunately,

assessing their well-being is arduous, as their behavior is relatively understudied (Leighty et al., 2011).

To assess the well-being of a zoo-living group of mandrills, I used Watters' (unpub. manuscript) idea of core behavior needs: acquiring reward, exerting control, and investigating (Table 1). Each of these needs was further divided into both positive and negative behaviors. According to Watters (unpub. manuscript), these core behavioral needs can be considered met when there is a balance between positive and negative behaviors. As such, the analysis presented here will serve three purposes: (1) assessment of the balance between the core behavioral needs; (2) evaluation of differences between positive and negative behaviors for each core need; (3) comparisons of negative experiences to elucidate which core need is most out of balance.

Core Behavioral Needs	Positive Experiences	Negative Experiences
1. Investigating	Search, Manipulate, Scan	Inactive, Self-groom
2. Acquiring Reward	Feed, Copulate, Drink Masturbate, Groom, Be mated	Pace, Be supplanted
3. Exerting Control	Stare, Mount, Approach, Avoid, Leave, Bite, Chase Locomote, Present	Be mounted, Be bitten Be chased, Pluck hair

Table 1: Behaviors organized as positive or negative experiences for each core need.

Methods

Subjects and Study Site

The subjects for this study were four captive mandrills housed at San Francisco Zoo. The zoo's operating hours were from 10:00 - 17:00 in the summer, and from 10:00 – 16:00 in the winter. The group consisted of one male and three females (Table 2). Throughout the day, the outdoor exhibit (Figure 1) exclusively housed the mandrills. After 17:00 hours they are given access to an indoor enclosure where they receive their evening feeding. During the nighttime and early morning hours, the mandrills had access to both the outdoor and indoor enclosure.

Name	Sex	Zoo of Origin	Date of birth
Angie	Female	Tulsa Zoo	Feb 10, 1992
Dora	Female	Tulsa Zoo	Oct 17, 1990
Jesse	Male	Buffalo Zoo	Sep 19, 1997
Lulu	Female	San Diego Zoo	Jul 24, 2002

Table 2: Summary of the specimen report, including name, sex, zoo of origin, and date of birth of each of the study animals

Mandrills

Data Collection

Data presented here were collected on the mandrills (see Table 2) between August 2014 and December 2015. Observations were made during daylight hours (10:00 - 17:00). Behavioral data was recorded using HanDBase (Figure 1), which is a database application for tablets (e.g., iPad). The HanDBase application was specifically designed to elucidate the three core behavioral needs (see Table 1) of the study subjects. Data collection consisted of 30-minute observations using continuous focal-animal sampling (Altmann, 1974). The behavior of the subject (see Table 1), the duration of the behavior, and the area of enclosure (Figure 2) in which the behavior occurred were all recorded. In total 100 hours were collected by four researchers (D. Williams, E. Lemus, K. Runzel, and C. Weidel), with approximately 30 hours collected on each of the study animals.

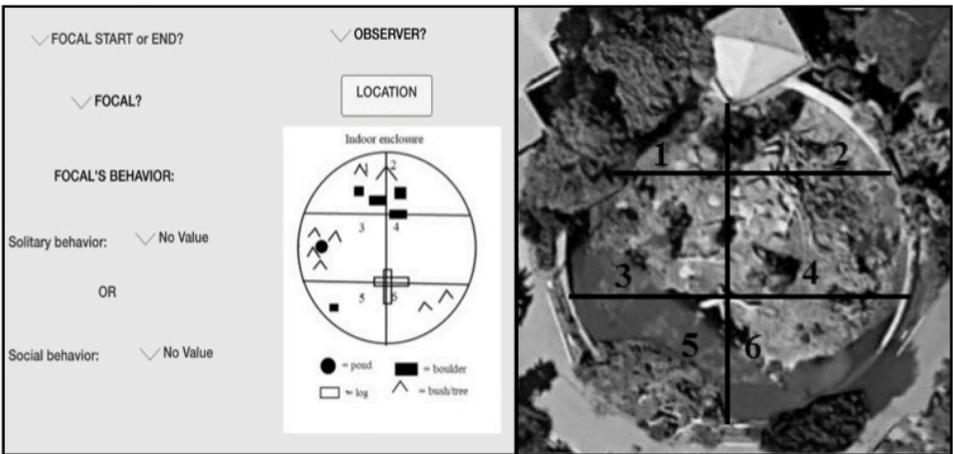


Figure 1: Screen shot of the HanDBase data collection application

Figure 2: Aerial view of the study subjects enclosure

Analysis

Following Watters (2011) proportions of the daily activity budget spent in a particular behavior were calculated. Many of the proportions were heavily skewed to the right, so I used an arcsin transformation in an attempt to fit the data to a normal distribution. The transformations did not succeed in normalizing all proportions, so the requirements of parametric statistical tests (e.g., ANOVA) could not be assumed. Therefore, non-parametric tests were employed. I used Mann-Whitney tests when the comparison was between two means, and the Kruskal-Wallis test was when the comparison was among more than two means. Since the Kruskal-Wallis test only indicates that at least one mean is different, I used post-hoc Mann-Whitney tests to indicate which means differed. To reduce the risk of a type one error, a Bonferroni corrected p-value (Abdi, 2010) was used on all

Mann-Whitney post-hoc tests (Figure 3). To estimate the size of significant differences, eta-squared (η^2) was computed by using the chi-squared statistic provided by the Kruskal-Wallis test (Morse, 1999; Figure 4). I followed Cohen (1992) for effect size interpretation (0.2 = small, 0.5 = medium, and 0.8 = large). All analyses were done on SPSS 22.

$$\alpha [PT] = \frac{\alpha [PF]}{C}$$

Figure 3: For the post-hoc tests, $\alpha [PT]$ denotes the significance level for a particular post-hoc test, which was calculated with $\alpha [PF]$ being the probability of making a type one error for the whole family of tests, whereas C was the number of tests being performed.

$$\eta^2 = \frac{x^2}{N - 1}$$

Figure 4: Eta-squared was estimated from dividing the chi-square statistic by the sample size ($N - 1$).

Results

Balance between Core Behavioral Needs

The proportion of daily activity spent in each of the core behavioral needs (acquiring reward, exerting control, and investigating) differed significantly (Kruskal-Wallis, corrected for ties: $\chi^2 = 0.62$, $\chi^2 = 36.706$, $p < 0.001$; Figure 5). I then used a Bonferroni corrected p-value ($0.05/3 = 0.017$) as the significance level for three post-hoc Mann-Whitney tests. As shown in Figure 5, the comparisons between acquiring reward vs exerting control ($r = .55$, $U = 29.00$, $p < .001$), acquiring reward vs investigating ($r = .64$, $U = 77.00$, $p < .001$) and control vs investigating ($r = .28$, $U = 15.00$, $p < .001$) were all significant. This suggests that all of the three behavioral needs were significantly different from one another. However, the eta-squared value indicated that the difference between acquiring rewards and investigating was small.

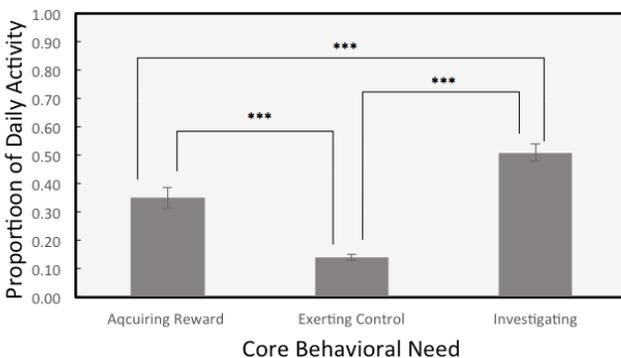


Figure 5: Mean proportion of the daily activity budget and standard error for acquiring reward ($n=20$), exerting control ($n=20$), and investigating ($n=20$). *** $p < 0.001$

Mandrills

Differences in Positive and Negative Behaviors

Figure 6 illustrates the difference between positive and negative behaviors. Positive behavior was significantly different from negative behavior (Mann-Whitney test: $U = 36.00, p < 0.001$). This suggests that when the three behavioral needs are taken together (Figure 6: ‘All Behavior’), the daily activity budget of the mandrills includes more positive behavior. I then set out to compare positive and negative behaviors of each behavioral need. When I compared positive and negative acquiring reward behavior, the difference was significant (Mann-Whitney: $U = 39.00, p < .001$; Figure 6). This suggests that in regards to acquiring reward behavior, the study subjects exhibit more positive behavior. The comparison of positive vs negative exerting control behavior was also significant (Mann-Whitney: $U = 116.00, p < 0.05$; Figure 6). The eta-squared value, however, suggested that the difference between positive and negative exerting control behavior was negligible. I then compared positive and negative investigating behavior, which also indicated significance (Mann-Whitney: $U = 23.00, p < 0.001$; Figure 6). This suggests that for investigating behavior, the study animals exhibit far more negative behavior.

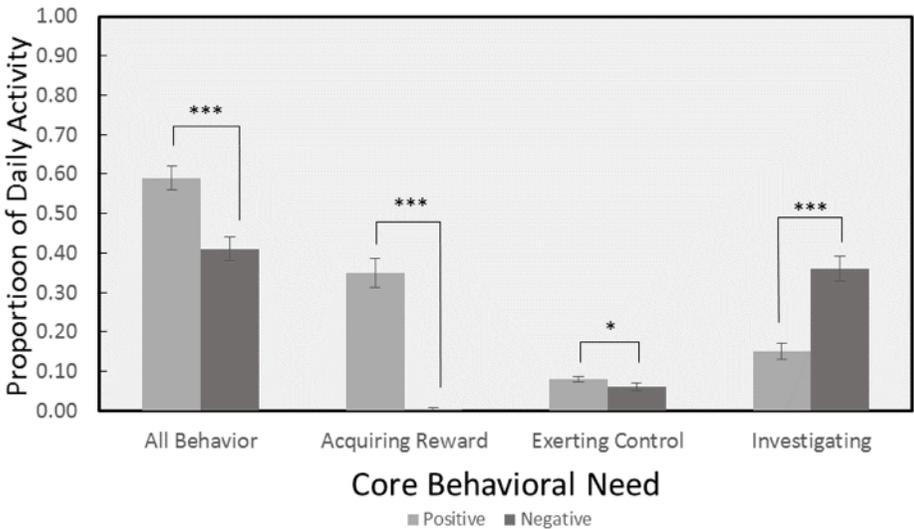


Figure 6: Mean proportions of the daily activity budget and standard errors for negative (n=20) and positive acquiring reward (n=20), negative (n=20) and positive exerting control (n=20), and negative and positive investigating behavior (n=20). *** $p < 0.001$
* $p < .05$

Comparison of Negative Behaviors

To elucidate which negative behavior makes up the largest proportion of the study subjects daily activity budget, I set out to compare only negative behav-

iors in acquiring reward, exerting control, and investigating. This overall test was significant ($\eta^2 = 0.84$, $F = 49.79$, $p < .001$; Figure 7). As shown in Figure 7, comparisons of acquiring reward vs exerting control (Mann-Whitney: $\eta^2 = 0.57$, $U = 11.00$, $p = 0.001$), acquiring reward vs. investigating (Mann-Whitney: $\eta^2 = 0.75$, $U = 21.00$, $p < 0.001$), and exerting control vs investigating (Mann-Whitney: $\eta^2 = 0.69$, $U = 10.00$, $p < 0.001$) were all significantly different from one another. Although all differences were medium in size, negative investigating behavior was most pronounced, as it made up 35 % of the daily activity budget.

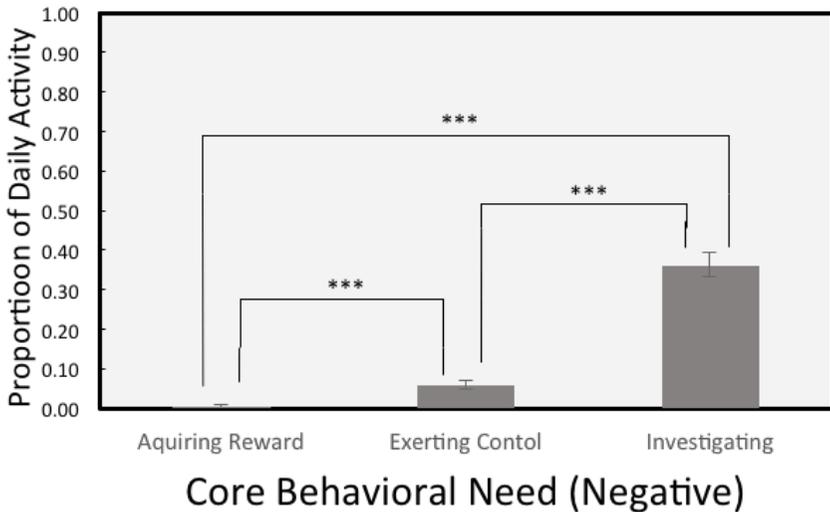


Figure 7: Mean proportions of the daily activity budget and standard errors for negative acquiring reward ($n=20$), negative exerting control ($n=20$), and negative investigating behavior ($n=20$). *** $p < 0.001$

Discussion

The research presented here, which made use of Watters' (unpub. manuscript) core behavioral needs paradigm, led to several interesting findings. First, these data make clear that the core behavioral needs paradigm is useful in elucidating animal behaviors, and further, which behaviors might be out of balance. Second, it is clear that the study animals engage in much positive behavior. When looking at their total activity budgets (Figure 6), for example, this analysis suggests that positive outweighs the negative behavior. Although this difference between positive and negative behavior was medium in size, when considering the well-being of captive primates it might be argued that a larger difference is desirable. Third, when looking at the comparisons between the positive and negative behavioral needs, these data also suggest that behavioral enrichment could im-

Mandrills

prove the well-being of the study subjects. As the vast majority of the negativity was expressed in investigating behavior, that is, an enrichment that aimed at reducing these behaviors would greatly reduce the total proportion of negative behavior. Hence, a behavioral enrichment that targets investigating behavior would be the most useful.

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Mandrills

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