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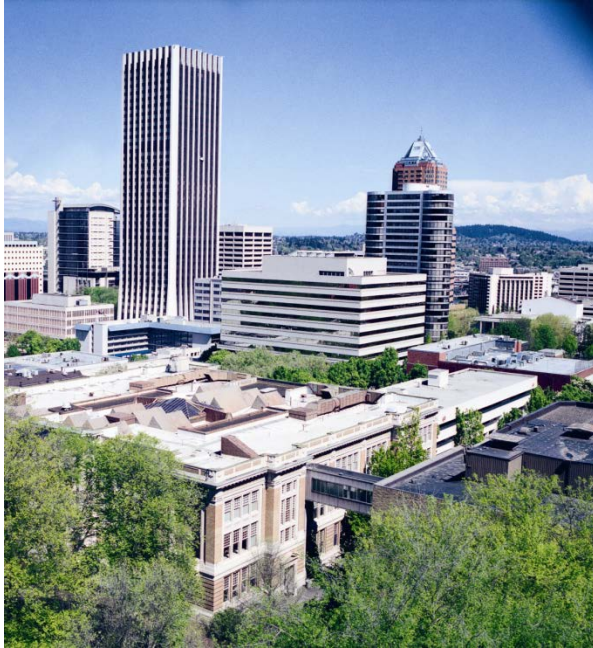
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2012 McNair Scholars Online Journal



The Ronald E. McNair Scholars Program at Portland State University (PSU) works with motivated and talented undergraduates who want to pursue PhDs. It introduces juniors and seniors who are first-generation and low-income, and/or members of under-represented groups to academic research and to effective strategies for getting into and graduating from PhD programs.

The McNair Scholars Program has academic-year activities and a full-time summer research internship. Scholars take academic and skills-building seminars and workshops during the year, and each scholar works closely with a faculty mentor on original research in the summer. Scholars present their research findings at the McNair Summer Symposium and at other conferences, and are encouraged to publish their papers in the McNair Journal and other scholarly publications.

The Ronald E. McNair Post-baccalaureate Achievement Program was established in 1986 by the U.S. Department of Education and named in honor of Challenger Space Shuttle astronaut Dr. Ronald E. McNair. The program, which is in its seventh year on campus, is funded by a \$924,000 grant from the U.S. Department of Education and institutional cost-share funds.

The McNair Scholars Program's student-centered approach relies heavily on faculty and university commitment. Activities and opportunities provided by the program focus on building a positive academic community for the scholars while they are undergraduates at PSU.

Ronald E. McNair



Ronald Erwin McNair was born October 21, 1950 in Lake City, South Carolina. While in junior high school, Dr. McNair was inspired to work hard and persevere in his studies by his family and by a teacher who recognized his scientific potential and believed in him. Dr. McNair graduated as valedictorian from Carver High School in 1967. In 1971, he graduated magna cum laude and received a Bachelor of Science degree in Physics from North Carolina A&T State University (Greensboro). Dr. McNair then enrolled in the prestigious Massachusetts Institute of Technology. In 1976, at the age of 26, he earned his Ph.D. in laser physics. His dissertation was titled, "Energy Absorption and Vibrational Heating in Molecules Following Intense Laser Excitation." Dr. McNair was presented an honorary doctorate of Laws from North Carolina A&T State University in 1978, an honorary

doctorate of Science from Morris College in 1980, and an honorary doctorate of science from the University of South Carolina in 1984.

While working as a staff physicist with Hughes Research Laboratory, Dr. McNair soon became a recognized expert in laser physics. His many distinctions include being a Presidential Scholar (1971-74), a Ford Foundation Fellow (1971-74), a National Fellowship Fund Fellow (1974-75), and a NATO Fellow (1975). He was also a sixth degree black belt in karate and an accomplished saxophonist. Because of his many accomplishments, he was selected by NASA for the space shuttle program in 1978. His first space shuttle mission launched successfully from Kennedy Space Center on February 3, 1984. Dr. Ronald E. McNair was the second African American to fly in space. Two years later he was selected to serve as mission specialist aboard the ill-fated U.S. Challenger space shuttle. He was killed instantly when the Challenger exploded one minute, thirteen seconds after it was launched. Dr. McNair was posthumously awarded the Congressional Space Medal of Honor. After his death in the Challenger Space Shuttle accident on January 28, 1986, members of Congress provided funding for the Ronald E. McNair Post-Baccalaureate Achievement Program. Their goal was to encourage low-income and first-generation college students, and students from historically underrepresented ethnic groups to expand their educational opportunities by enrolling in a Ph.D. program and ultimately pursue an academic career. This program is dedicated to the high standards of achievement inspired by Dr. McNair's life.

Source: mcnairscholars.com

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Between Two Worlds: Identity and Community in Oaxaca

By Mandy Elder
Faculty mentor: Dr. Jack Corbett

Abstract

Access to educational opportunities is the driving force in promoting gender equality and alleviating the effects of poverty among rural populations in Mexico. In Oaxaca, small universities with scholarship programs have recently opened in rural areas to increase logistical and financial access for young people from indigenous communities; however, proper consideration has not been given to cultural constraints and psychological factors that continue inhibiting university access, particularly for young women. Due to traditional, conservative family values with regard to gender expectations that maintain women in subordinate positions to men, women face additional challenges when attempting to balance home community life while pursuing higher education. Qualitative research methods including ethnographic observations, individual interviews and focus groups were used among young, indigenous women attending university, their family members, and university staff to examine the social systems in which women study and live. Through the use of the snowball technique and key informants in the university, participants were recruited in a culturally appropriate and sensitive manner. This research shows the impact diverging from traditional gender norms has on young women's self perception and familial relationships, and provides a better understanding of the impact socio-cultural factors exert on first-generation university women.

Rural Mexican Family Structure

Historically Mexican culture has placed a high value on the collective family unit. This value can especially be seen among rural Mexican families dependent on the labor of each family member to sustain the household. Men in families – fathers and sons - typically are engaged in paid labor outside the home or working in the family's field, tending to livestock and crops to produce food for self-consumption or to sell in local markets (Arias, 2009). Meanwhile, women – mothers and daughters – work within the home cooking, cleaning, raising children, and making tortillas. The gendered division of labor is so strong within these families that community members sympathize with families who have all male or all female children because one of the parents will be left without help in their household duties (Musalem Merhy, n.d.). Historically, women's work inside the home has been viewed as "help" or as "complementary" work to men's work in the public sphere. According to Arias (2009), the perception of women's labor as merely complementary has devalued not only their work, but women themselves as members of the household and community, as well. This has been one form of informal social control preventing women from leaving the private sphere.

As demonstrated by the Oaxacan term "pueblo chico, chisme grande" [small town, plenty of gossip] and the overall concern many women have for their reputation, gossip and innuendos are a second form of social control used to maintain both men and women in their respective roles. Esteinou (2006) explains that comments such as "¡Mira!, ya puso su mujer a trabajar porque no puede mantener a su familia" ["Look! He made his wife work because he can't maintain his family."] cause men to exert force over women to ensure their dominance in the family. Other comments directed towards women such as "Está descuidando a sus hijos" ["She isn't taking care of her children"] place guilt on women for working outside the home instead of tending to her children (p. 87). Thus, in small, close-knit communities both men and women learn to carefully negotiate gender norms to prevent negative reactions from community members.

Due to the influence of globalization and migration, roles within families have been changing in recent years. An increase in the rights of children and decrease in the presence of male authority figures within households has challenged the historical power structure (Esteinou, 2006). For example, fathers traditionally have been in charge of administering discipline to children. Women, however, have begun to take on this role and many others due to male migration to the United States. Courtship between young lovers has changed drastically due to opportunities to meet people from other towns, states, and countries and exposure to new and different ideas. Weddings more frequently take place in December when relatives visit home for the holidays, age at first marriage has increased, and traditional practices such as “bride stealing” have become less prevalent in recent years (Esteinou, 2006). Additionally, emigration has increased the standard of living for many Mexicans due to remittances sent home from work in the United States (Esteinou, 2006). Nevertheless, strict gender norms are still very present in Mexican society, particularly in Oaxaca.

Oaxacan Gender Norms

Jayne Howell (1999) shows that even among educated, employed Oaxacan women from rural communities, gender role socialization is a primary force in life decisions. Although many women participating in her study explained that education is a beneficial and important component of a woman’s life, they still consider their primary role as a woman that of a mother and secondly, a wife. Characteristics of rural family values are reflected in the felt responsibility to fulfill familial obligations women feel and the influence family members have over their lifestyle choices, personal relationships, and professional development. Although the women in this study reflect a changing belief about the roles women are allowed to play in Mexican society, many women still hold traditionally female dominated occupations – teachers, secretaries, and nurses. Despite greater economic security and participation in the public sphere, women continue adhering to traditional gender roles while negotiating careers and pursuing education. Jayne Howell (1999) cites this as an indication of entrenched Oaxacan values and the strong influence of socialization in determining life outcomes.

As Pérez (2000) showed in the artisan community Santa Maria Atzompa, gender roles guide interactions among family and community members. One significant socialization mechanism in Mexican culture is the *fiesta* (Pérez, 2000). Fiestas are typically associated with religious or political events, include excessive alcohol consumption by men, and often violence. Pérez (2000) explained that the male violence directed at other males, their wives, and/or daughters, is due to men’s insecurity over the increased autonomy women hold in a highly *machista* culture. Because women in Santa Maria Atzompa are the primary producers of the town’s craft, pottery, they have gained power due to the town’s economic dependence on the sale of pottery to tourists and visitors. Santa Maria Atzompa is an example of the development of change in gender roles in Oaxacan culture and the negative reaction to women seeking change, independence, and autonomy.

Education in Mexico

As evidenced by Oaxaca’s 16.3 percent illiteracy rate compared to the national illiteracy rate of 6.9 percent, the level of education in Oaxaca is significantly lower than the national average for Mexico (INEGI Perspectiva Estadística de Oaxaca, 2011). Not surprisingly, women experience a much higher rate of illiteracy than men, which holds true across all age groups nationally (INEGI Mujeres y Hombres en México, 2010). Additionally in Oaxaca, the average level of education for women is only six years – or primary school, compared to 6.9 years for men. More strikingly is the comparison between Oaxacan levels of education and the national average. Women on average in Mexico have 7.9 years of education and men 8.4 (INEGI Censo de Población y Vivienda, 2005).

Careful consideration of these statistics is important because as Stromquist (1992) emphasizes, “elimination of illiteracy among women will necessitate the elimination of poverty and the redefinition of women’s role in society” (p. 19).

Despite claims by the Mexican government in Constitution Article 3 that Mexico’s education systems provides equal educational opportunities for all, historical sexism and strong gender role socialization inhibits girls’ pursuit of education and affects the quality of education they receive (Scherer Castillo, n.d.; Stromquist, 1992; Zubieta-García and Marrero-Narváez, 2005). The subtle reproduction of gender roles within the education system occurs in a variety of ways. First, on an institutional level, consensus built through education, combined with a historical lack of attention to women’s educational needs, “sustains the hegemonic thinking of society” (Stromquist, 1992, p. 5). Next, biased teachers who are also products of cultural socialization not only transmit their values about the proper role of women in society but also teach from the perspective of males throughout history. That is to say the curriculum, textbooks, and the education system are designed by males for males, promoting the dominant ideology and ignoring the role of women (Scherer Castillo, n.d.).

Because the education system’s role is to prepare students for their future, lessons and classes are biased towards the work men and women will be doing after completing schooling. Men, who will most assuredly work outside the home providing for their family, receive more training in math and sciences and additional encouragement from family and community members who see more value in educating males. Since the ultimate goal for Mexican women in rural communities is to marry and have children, women receive limited support from family members who typically do not value women’s labor nor see a need for a level of education higher than secondary (Scherer Castillo, n.d.). Thus, when women do pursue higher education, not only do they tend to drop out at higher rates, but also typically concentrate in humanities and social sciences which traditionally have lower salaries and reflect women’s already prescribed gender roles (Stromquist, 1992; Zubieta-García and Marrero-Narváez, 2005) As described in methodologies, however, women who participated in this study are pursuing non-traditional career paths which creates additional tensions young women must negotiate.

The patriarchal structure of Mexican households, prevailing attitudes about socially appropriate roles and ambitions for women, and institutional discrimination within the education system itself create barriers in accessing higher education for women from rural communities. Despite this, young women in Oaxaca are seeking educational and professional opportunities outside of their home communities. In this study, I examine the ways in which higher education has affected young women’s perception of their identity as it relates to community and family membership within various relationship subsets.

Research Context

Research design

Purely qualitative methods were used while conducting this research. While living with young women attending university in the community San Pablo Huixtepec, individual semi-structured interviews, and semi-structured focus groups were conducted. All data were collected in Spanish, and when necessary, bilingual participants translated for monolingual family or community members who spoke an indigenous language. Qualitative methods were the most culturally appropriate and effective approach to connect with young women as it was important that they felt a high degree of trust and confidence when sharing their stories and personal experiences with me. My initial contact with research participants was through supporting English classes in La Universidad Tecnológica de los Valles Centrales de Oaxaca which allowed me to not only offer something in return for the university’s support – an act reflecting the importance of reciprocity in Oaxacan culture – but also interview and gain the perspective of professors, the school

psychologist, and women working in the university. In order to interact with women on a repeated basis my housing was arranged by the university which allowed me to live with a small group of young women who receive a university sponsored housing scholarship.

Upon arriving at my new home the first night I was surprised to say the least to see the conditions which I had unknowingly agreed to live in and wondered why no one at the university had informed me of the situation. Two girls shared a single room without windows or a kitchen and slept on *petates* – straw mats – and blankets folded beneath them on the concrete floor. I sat my backpack down, wondering what I had gotten myself into, while I waited for my roommate, Isabel to get home from school. When she arrived, Isabel very patiently showed me where she washes her clothes by hand in the shade of a tree, the bathroom around the corner, and where the hose is to fill a bucket up for bathing and flushing the toilet. Later that night her boyfriend came by, and we found a small *comedor* around the corner to eat tortas and quesadillas while we chatted about our families, friends, and begun to form our friendship.

Conducting ethnographic research allowed me to fully develop a sense of the ways in which young women operate in different social settings including among friends and professors in the university, with community members in San Pablo Huixtepec, and with friends and relatives in their home communities. While living in San Pablo Huixtepec I was able to interview a broad spectrum of residents ranging from *mototaxi* drivers, migrants who recently returned from the United States, housewives, entrepreneurs, and children. Interactions with a variety of residents allowed me to not only understand the community women lived in while studying, but also develop a sense of the general public's opinion of higher education's role in Oaxacan society and women's participation in the university. During visits to the home communities of women I observed the realities of life in a rural Oaxaca town including production of food for self-consumption, the art of making tortillas, and the gendered division of labor. Individual interviews were conducted in informal settings with loose structures, the most realistic method given the living situation described above. Often I found myself sitting around on *petates*, eating tortillas and cheese while conducting guided focus groups with my roommates. From these informal conversations stemmed the most interesting and meaningful findings of my research as they happened organically under conditions that were conducive to interacting as friends instead of creating a researcher-participant dynamic.

Choice of research community

A variety of factors influenced the decision to conduct research in San Pablo Huixtepec. Because of its location it is able to serve students from a variety of communities from around the Central Valleys and other more rural regions. San Pablo Huixtepec is located about forty-five minutes outside the state capital, and is a primarily agricultural town with a population of 9,025 (INEGI Perspectiva Estadística de Oaxaca, 2011). The nearby commercial center, Zimatlan, provides San Pablo Huixtepec with a weekly market, but many of the town's residents are small business owners who opened convenience stores, internet cafes, *estéticas* (beauty supply stores), or simply own a piece of the farm land surrounding the town. Two noisy main streets run through San Pablo where older men often sit on stoops watching as women run household errands on their way home from one of the eight Catholic churches in town. The park in the center of town is home to the government building, the main church, and fountains and benches which in the evenings can be seen filled with young couples – some university students, some high school students – cuddling and flirting outside the constraints of their parents' homes. Santa Ines Yatzeche provides an interesting contrast as San Pablo's closest neighbor, an indigenous Zapotec community a five minute *mototaxi* ride away. Both towns have seen an extremely high level of emigration to the United States, especially to Seaside, California, as evidenced by the American style architecture in homes, American style dress of many young men, graffiti written in English, and signs announcing weekly delivery dates for packages to and from the United States. The familiarity with U.S. culture

present in this town was conducive to connecting with people who had a more grounded understanding of my cultural perspective, and within the university setting, a general familiarity of the research process.

La Universidad Tecnológica de los Valles Centrales de Oaxaca (UTVCO) is a small university that opened in 2009 in order to cater to the region's specific needs by offering majors in fields related to agriculture: Business Development, Renewable Energies, Agro-Industrial Processes, and Commercialization. Although these majors are not traditional subjects studied by women, 59.9 percent of the students in the UTVCO identify as female (Reyes Morales, 2009). The poverty prevalent in Oaxaca is present among the student body population, as well. The average monthly income of the students' families is \$4,998 Mexican pesos or about \$400 US dollars; however the lowest income is \$800 Mexican pesos, or the equivalent of about \$70 US dollars. Low income levels reflect the low average level of education among the students' parents: fathers on average have eight years of formal education, and mothers have a mere seven years. Several scholarships are provided to qualifying students: tuition, housing, nutrition, and a quarterly cash stipend. Although minimal (the nutrition scholarship provides one meal a day), these scholarships offset the cost of education for low-income students, do not detract from families' limited resources, and make it possible to attend college.

Overwhelmingly students observe traditional divisions of labor among their parents which reflect the conservative, traditional nature of typical Oaxacan families. 46.4 percent of all fathers are *campesinos* or farmers, while 75.9 percent of all the mothers declare themselves an *amas de casa* or homemakers. Additionally, only 69 percent of all parents expressed interest in their daughter or son studying at a university level, leaving 31 percent who do not express interest and perhaps would find it harder to support the university experience and their child's pursuit of higher education (Reyes Morales, 2009). The low percentage of parents who studied at a university level – 3 percent of fathers and only 2 percent of mothers – could also contribute to a lack of interest in their sons and daughters studying, as well as a variety of other disadvantages first-generation college students experience due to a lack of cultural capital and social scripts that aid in successfully mastering roles as students (Collier, 2008).

It is additionally important to understand that this university does not fit the typical American university model. Typically, the United States' view of the university experience is that of enriching opportunities, a dynamic social environment, and interactions with scholarly, experienced professors. The UTVCO, however, strikingly lacks these characteristics. Much of the faculty is comprised of young, recently graduated, urban twenty-somethings who generally lack field experience, mentoring training, and the diversity of perspective generally expected of an institution of higher education. There are no student clubs or university life, relatively few opportunities for leadership, and the campus is isolated from the San Pablo community. Students are divided into separate *salones* – essentially classrooms - where they spend the duration of their *carrera* – major – with the same group of ten to twenty-five students. Teachers rotate between the salones while students stay within the same four white walls every day. Thus, although college is traditionally thought of as a transformative experience, the environment within the walls of the university is not conducive to creative thinking nor personal growth and development. In the end, the university does provide a new experience distinct from that of a small, rural village, but in a way that is difficult to negotiate and fails to take into consideration the unique needs of students from disadvantaged backgrounds.

The following text is divided into two main sections: Perception of Identity in San Pablo Huixtepec and Perception of Home Community Dynamics. Location is an important factor in understanding how young women perceive themselves as many of the students are from communities several hours away from San Pablo Huixtepec. Students whose families are from San Pablo Huixtepec or nearby towns remain living with their parents, but students from communities throughout the

Central Valley, the Sierra Sur, or the Mixteca must move in order to attend classes. When at all possible students, particularly young women, remain living with their families for both economic and personal reasons. Overwhelmingly, young women who live with their parents express significant distress over the thought of moving out of their parents' home and missing their family members. Upon learning that my parents were not in Oaxaca with me, young women would quietly gasp and ask, "Don't you miss them?" Their concern about my connection with my family demonstrates the strength of familial bonds and connections in their home communities and sets the back drop for understanding tensions women experience upon moving to San Pablo Huixtepec.

While living and studying in San Pablo Huixtepec a new subset of relationships forms with classmates, professors, and community members. Among these new relationships are people from different communities, ethnicities, ideologies, experiences, and languages that influence and shape a young woman's perception of herself and her role within her family and community. At times these relationships challenge women's perspective; other times they reinforce already prevailing ideologies. Thus, within the geographically divided sections, I discuss perceptions of relationships both within the context of San Pablo Huixtepec and young women's home communities and the complex social structures women must negotiate in their attempts to reconcile two distinct worlds while attending college.

Results

Perception of Identity in San Pablo Huixtepec Living away from home

Isabel and I sat on the stoop of our room one evening watching men return home from a day's work in the field in wooden wagons pulled by horses and donkeys. Barefoot women passed by carrying tortillas in palm baskets on their backs, children played in puddles of rainwater, and Mexican banda music squeaked from Isabel's cell phone speakers in the background. When Isabel did not have homework or a project due, this was a fairly typical evening after school for us. All the by passers greeted us with "Buenas tardes" or "Adios" and a head nod as they continued on their way, but one man stopped. He must have noticed that we were sitting on the floor instead of in chairs or seen the lack of furniture inside the room because he asked us if we wanted to buy a couch. "No," Isabel responded, "es que no vivimos aquí. Solamente estudiamos en la universidad." [No, it's that we don't live here. We just study at the university.] The man seemed to understand, excused himself, and continued on his way.

Isabel's comment that evening was an indication of the way she identified with the community and her sense of belonging in San Pablo Huixtepec. Although she had lived in this community for four years and was now in her final year of college, she did not consider her living arrangement permanent enough to warrant purchasing a couch to sit on (financial constraints aside). In fact, many of the women whom I interviewed reported that although they "stayed" in San Pablo during the week, they returned home every weekend and on breaks from classes to help with household duties. This is reflective of the strong ties they hold to their home community and family, as well as the expectation families hold that after studying the student will return to their home community to live and work. Additionally, as these young women are not married and living with their husband's family, due to the patriarchal structure of Mexican households they remain under the supervision and authority of their fathers despite living independently or with classmates. Thus, familial obligations continue, perpetuating strong familial ties that prevent women from fully embracing their new living arrangements.

Two of the women I interviewed, however, reported feeling "más a gusto" [more comfortable] in San Pablo Huixtepec than in their home communities. In these cases, being in San Pablo afforded

them the opportunity to be away from home and escape not only the patriarchal structure of their household but also avoid tumultuous family issues and domestic violence. Because they were no longer under the supervision of their parents or community members, they were able to begin creating a new identity and self perception. Rebecca, who comes from a small community two hours from San Pablo Huixtepec, gradually embraced the opportunity to adopt a new identity. One professor at the university reported that when Rebecca started attending school, she was very shy, withdrawn, and performed poorly in her classes. He attributed these qualities to the sheltered life she had led in her home community and a lack of proper preparation during high school. Now, outgoing, energetic, and always smiling, Rebecca is one semester away from completing her degree. Rebecca also took advantage of her independent living situation to invite her boyfriend to visit and stay in San Pablo. When I asked if her family knew he stayed with her, her eyes widened and her smile broke into a laugh that clearly meant "No."

El Salón

Due to its enclosed and isolated nature, the salón is a very important social environment for students as relationships with varying degrees of intimacy are formed through daily classroom activities, group projects, and field trips. The combination of women and men from different communities throughout Oaxaca working and studying together in the salón creates social dynamics that serve as informal control mechanisms and reproduce divisions between genders, social class, and ethnicity that students learn in their home communities.

Divisions in gender are made explicit within the university through overt expressions of gender. First, on days where students are required to wear their school uniforms, males come to school dressed in blue collared shirts and females in light pink. A third white shirt option is available, but apart from professors and university personnel, I only observed one female student wearing one. Women frequently cinch the shirts on the sides, sewing them so that they fit more snugly. Secondly, during group field projects, the gendered division of labor is replicated through both the students' choosing and direct professor instructions. One afternoon I had the opportunity to accompany Isabel's salón to their group farm plot where they learn to cultivate products for market. Males arrived that day with machetes prepared to cut briars to line the vegetable plots to prevent the neighbor's goats from eating the bean and squash plants. One woman had brought her father's machete with her that day, but handed it over to the males when it was time to start work. The women sat their bags and purses down in the shade and headed out to the field to pull weeds, as instructed by their professor. Tasks in the field were clearly divided according to gender and perceived expertise or abilities.

During a three day salón field trip to Cuernavaca, gender roles were explicit with regard to meal planning and preparation. Prior to leaving, the food planning committee, which was entirely comprised of women, planned all the meals including ingredients, number of portions, and individual expenses. Men were neither asked what they wanted to eat nor to contribute to the planning but were merely informed of the pesos they were required to contribute. Shortly before arriving in Cuernavaca, the women – who were all sitting together in the front of the bus – started discussing that night's meal. Would we have soup, tlayudas, or just quesadillas? The discussion continued for at least five minutes as they weighed each option carefully, wondering if they had enough lettuce or meat for one dish or the other and how hungry everyone would be. Finally one woman chimed into the conversation, "¿Por qué no preguntamos a los chavos?" [Why don't we ask the guys?]. A few of the women laughed and rolled their eyes as another shouted towards the back of the bus asking what the men wanted to eat. As all the women had expected, the men did not care and suggested we stop for roadside tacos. The men's opinion was considered momentarily before being dismissed as the women continued debating the best dinner option.

Melanie, from an artisan community near San Pablo Huixtepec, seemed to take charge of the other women. While everyone unloaded the bus, Melanie snapped her fingers, gave a little whistle, and shouted, “¡Chicas! ¡A la cocina! [Girls! To the kitchen!]” The food was carried into the kitchen, and all the women got to work preparing dinner. Meanwhile, the men took a tour of the ranch we were staying at, milked cows, and relaxed at the dinner table while they waited for the women to serve them. When I questioned the women about why they had decided to take the lead in food preparation and why the men were not helping in the kitchen, some looked perplexed as to why I would even ask the question. Others answered that they did not find the division of labor fair, but they did not see another option. “Habríamos comido tacos de la calle,” they responded. [We would have eaten roadside tacos.]

During this same field trip to Cuernavaca my roommate, Isabel, expressed to me her feelings of being an outsider among the other women. While she had to borrow money for the trip and was unable to purchase souvenirs, she commented that she felt sad as she watched her other classmates buy “anything they wanted”. She used this opportunity to explain “Las Divinas” [The Divine Girls] to me. In her salón there were four girls from the city and Central Valley. These girls were distinct from my roommate and her closest friends. They were typically lighter skinned, wore tighter, flashier clothing and makeup, carried cell phones with MP3 players and cameras, and were overall less reserved. When the salón first formed during their first term these four girls clustered together in a corner of the room and proudly hung a sign above their area with their self-proclaimed title “Las Divinas”. Eventually a teacher asked them to take the sign down, but the girls remained in their corner of the room and the sentiment they evoked among the other women in the classroom continued. Isabel, who is dark skinned from a very humble, indigenous background, was reminded of the class and ethnic divisions between herself and her peers by not being invited to join Las Divinas. The clear contrast Las Divinas had created in the classroom set the stage for future interactions, and Isabel never formed a close relationship with them. She said while she tried not to pay attention to them or the fact that they received the most attention from males, dressed nicer, and intentionally set themselves apart, she could not help but feel bad about her own appearance and lack of financial resources.

My own attempts at conversing and connecting with Las Divinas were not always successful. This group of girls interacted with me on a more superficial level despite my attempts to connect with them. A professor explained to me this could have been because I associated more with Isabel and they did not want to be closely associated with her; however, judging from non verbal cues and the way their body language and interactions changed in the presence of men or women, my best assessment of the situation was slight feelings of mistrust or suspicion. Thus, although I interacted with Las Divinas very superficially I was never able to interview them about their relationships within the salon, which is indicative of their self-proclaimed exclusivity.

Perception of Home Community Dynamics

Introduction of new knowledge

In many Valley communities most residents communicate in Zapotec. Young people are taught Spanish in schools, but within the home purely Zapotec is spoken. Typically men are more proficient in Spanish than women, as was the case with Isabel’s mother and father. When I spoke with Isabel’s older siblings and parents, we all strained to understand each other’s accents and misconjugated verbs. Of course in the university in San Pablo classes are held in Spanish. While other students and faculty are generally aware who speaks a “dialect” as they call the indigenous languages, rarely are they heard spoken. Dialects of the different indigenous languages vary so greatly from town to town that often speakers of one dialect cannot understand speakers of another – even if the other town is only a few kilometers away. Thus, trendy or commonly used words in one town could be completely unheard of in others and certainly would be difficult to translate to Spanish. Nevertheless, Isabel’s mother has asked her to translate a word specific to

their town to Spanish. When Isabel did not know, her mother responded, "Don't they teach you that at the university?"

Comments such as these were reported frequently among the women I interviewed. By criticizing the education women receive family members discredit the importance of education and the new knowledge acquired in college, a critique that may discourage women from continuing. As an institution primarily focusing on agricultural training and product marketing students at the Universidad Tecnológica de los Valles Centrales de Oaxaca focus a lot of their studies on efficient and environmentally conscious farming practices. This is particularly useful given that many of the students come from rural communities that survive on subsistence farming. Thus, several women shared that they had attempted to explain better, more modern, or more efficient cultivation methods to family members only to be met with resistance. Grandmothers and mothers alike reacted as if insulted. They had been making tortillas, planting corn, or harvesting fruits and veggies for years the same way as their mothers and grandmothers had and did not see a reason to change now. Information women shared with their family members included basic hand washing, food sanitation, and recycling all of which were shrugged off as impractical habits learned in college and not grounded in the families' realities. Women reported that this rejection of new knowledge and the questioning of the university's and young woman's authority made them feel devalued and like their hard work is not respected by their family members.

Sibling relationships

Siblings proved to be a significant source of familial tension, particularly for women whose siblings did not also pursue high school or higher education. Mexican families typically have strong bonds between siblings; women live in their parents' home until they marry and after marriage move into the home of their husband. Negative reactions towards women from brothers and sisters can be particularly hurtful due to these strong familial bonds. For example, when Isabel began studying, her brothers and sisters refused to believe that she was actually taking classes. They did not understand how she could spend all day in a classroom until her first semesters had passed and she could prove to them she had been in school the whole time. While Rebecca's sister did believe she was going to school, she questioned her motivation - it must be in order to meet a boyfriend.

Women also reported jealousy from their siblings. Samantha's salón had taken an overnight trip to Veracruz one term. Later, her family decided to take a vacation together to the beach in Oaxaca but her sister claimed it was not "fair" that Samantha got to take two trips – one to Veracruz and one to the beach. Their father defended Samantha's right to go to the beach as a member of the family, and in the end, her sister stayed behind. Little did Samantha's sister know, the trip to Veracruz was strictly academic and the students were not granted free time for the beach. The same misunderstanding of what happens during a school day is common, as well. Samantha's brothers and sisters all complain that it is not fair that Samantha does not have to work around the house as much because she just "sits in a classroom all day." They not only misunderstand the amount of mental energy and homework college requires, but they also again delegitimize the pursuit of higher education and the young woman.

Meanwhile, classmates in young women's salones understand the amount of work and personal commitment college requires and can build relationships based on this mutual understanding. While it is important that students connect with each other, young women encounter difficulties when their relationships with other students begin developing deeper meaning. After time women find they cannot connect with their siblings in the same way as they do with their classmates due to changes in sense of humor, personal interests, and the tensions described above. This is particularly stressful for young women and for family members whose prior frustration compounds with their decreased ability to communicate.

Rejection of relationships

Overwhelmingly all the women interviewed in this study reported that the majority of the other women they went to middle or high school with have stayed in their home towns to get married and have children. One girl even said there are kids on every corner of her town because the girls “van embarazándose” [keep getting pregnant]. The lifestyle that is required of attending college and the lifestyle of raising children in a small, rural community are very distinct. Given this, it is not surprising that every woman interviewed reported that she no longer spends time with her friends from middle and high school. In many cases, friends simply stopped talking to the women and only on occasion will greet them as they pass in the street. No one had answers for exactly why people stopped talking to them except guesses and assumptions – jealousy, perceived feelings of inferiority or superiority, or a lack of commonalities. When Samantha and her high school boyfriend broke up after her first year of college, however, she knew exactly why. He had quit attending high school and had no interest in pursuing higher education. As Samantha had to spend even more time in school, he was jealous of other men she might be meeting and felt threatened by her level of education – he was afraid if they got married, she would earn more money than him.

While friends usually did not blatantly state the termination of friendships, Betsy's father did. Betsy's oldest sister had attempted to emigrate to the United States and was deported and jailed on three occasions. She now lived in the northern part of Mexico. Betsy's other sister also attended college, and Betsy was now in her last year of classes. All of her father's children had “left him” to pursue other – non-familial – interests outside of the town. As we sat around on our *petates* in San Pablo Huixtepec, Betsy explained the abuse from her father her family had suffered growing up with tears in her eyes. While she saw attending college as an escape or relief from the pressures of her town, her father had told her, “ya no tengo hijos” [I don't have children anymore]. Betsy's explanation for this comment was that her father is *machista* – the same explanation she gave for why he did not support her studying in the first place. Damaging comments from family members and friends not only complicate women's experience while attending college, but also serve as a type of warning for other women who remain in their home communities. Seeing the consequences attending college has on these young women's relationships other young women including sisters, cousins, and friends, could be convinced not to do so for fear of ending friendships and family relationships.

Acceptance of and desire for more egalitarian gender roles

Finally, every young woman interviewed in this study expressed a higher level of acceptance for more egalitarian and varied gender roles compared to their reports of family and community members' gender role expectations. While this is beneficial for the women and for promoting gender equality, it can have negative ramifications for women who attempt to diverge from their traditional role within their families. Most notably, women reported questioning the traditional role of men and women within their families and within both present and future romantic relationships.

Traditionally in Mexican households women prepare meals and serve the men who wait at the dining table. This custom was shared among every household of the women participating in this study as was the sentiment that women's subordination to men with regard to meal preparation is unfair. Upon expressing these feelings to their mothers women were met with resistance. Rebecca, for example, thought it would be a good idea to teach her younger brother to cook, clean, and do laundry. Her mother, however, refused to allow it claiming he would never need to know how as he is male. Other women have refused to serve their brothers food on the basis that they are capable of serving themselves, but after time the effort is not worth it. Betsy is an example of someone who has not yet given up the hope of changing her mother's mind. After years of abuse from

Betsy's father, Betsy has slowly began to convince her mother that she does not have to stay in a relationship with him and that domestic violence is unacceptable.

Attending college has also influenced the way in which young women perceive their current romantic relationships and future marriages. First, because these women decided to study instead of marry after middle or high school they already had a different vision for their future than the typical young Oaxacan. Furthermore, everyone agreed they would only marry a man who would allow them to have a career and work outside the home. As one woman stated, "¿Cómo puedo seguir adelante si tengo un marido que quiere que me quede en casa?" [How can I advance if I have a husband that wants me to stay at home?]. Additionally, all the women wanted to first finish school and start their professional careers before marrying or having children. Isabel enacted her newly formed ideas about acceptable gender roles with her current boyfriend, although she found this more difficult to do while they were in their home community together. On a joint school project not only did Isabel take the lead in developing their project idea, but she was widely recognized as more hardworking and committed to success than her boyfriend despite his best efforts to diminish the perceived value of her work.

In these instances, new knowledge gained from attending university, working equally intellectually with males, and contact with women in leadership positions has influenced these students' ideas about gender roles and has allowed them to begin creating new constructions of familial and romantic relationships.

Concluding Remarks

Higher education has a profound impact on the lives of young women from rural communities. Despite the emotional and relational consequences women reported experiencing since pursuing higher education, all the young women unanimously agreed that education has positively impacted their lives. Indeed, all the women reported they had decided to continue their education to increase their quality of lives for themselves, their families, and their future children. This study is comprised of a small group of very motivated and hardworking young women who generously shared their lives, struggles, and friendship with me during the summer spent in San Pablo Huixtepec. For many women, this study was the first time someone had asked them about their experience and discussed the topics presented in this essay, and many expressed feeling pride and comfort in having their voice heard. Empowering opportunities such as this and an increased focus on educational access among marginalized populations is essential to the elimination of *machismo* and inequality in Mexican society.

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Investigating some Correlates of Hegemonic Masculinity and Criminal Motives among Residents in Juvenile Correctional Facilities.

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Abstract

The primary goal of juvenile corrections is behavior reform through various therapeutic programs; yet, juvenile reoffending persists as a costly and serious social problem. Few studies have examined how the quasi-military approach of juvenile corrections may conflict with its therapeutic goals. A comprehensive literature review revealed several disturbing findings concerning youth residing in juvenile facilities, such as one study that reported a paradox between therapeutic programs and a correctional punitive culture. Moreover, these studies suggest that the prisonized nature of corrections can reinforce hegemonic masculinity in residents, increase moral disengagement, bullying, lying, and criminal behaviors is problematic. Accordingly, the current study explores the issue of rehabilitation in such environments by assessing the relationships between residents in juvenile corrections, hegemonic masculinity, and criminality. The findings of the current study and literature review suggest the need to reevaluate juvenile corrections as an institution of rehabilitation.

Keywords: juvenile corrections, hegemonic masculinity, masculinities, identity

Introduction

Some scholars argue that the United States juvenile correctional system presents some of the most socially controversial and financially expensive issues challenging our society today (Tewksbury & Mustaine, 2001; Pearson Criminal Justice, 2010). An estimated \$40 billion dollars is spent on juvenile corrections (U.S. Department of Justice, 2010). This huge expense forces several states to actually spend more money on corrections than education. With so many lives at stake and so much money being spent, policy makers and citizens have a responsibility as a society to change broken policies and utilize evidence based practices to implement the most effective rehabilitative programs for these juveniles.

Over the past few decades, juvenile justice systems in the United States have maintained a trend that has discouraged placement of juvenile offenders in non-secure, community-based programs and has increasingly utilized a more punitive than rehabilitation oriented response to the social problems of juvenile crime and delinquency. The beginnings of this punitive trend can be seen in the 1980s, during the crack epidemic and resulting crime wave. However, criminologists assert that the "get tough" on crime policies have had several negative impacts such as: the unprecedented growth in correctional populations, massive correctional overcrowding, reduction of early release, stricter sanctions, lengthier sentences, incapacitation of nonviolent offenders, and certifying youths as adults (Hagan, 2009; Pearson Criminal Justice, 2010; Tewksbury & Mustaine, 2001). Criminologists also assert that the United States correctional system is in crisis as a result of "get tough" policies despite all-time lows in crime rates across the United States (Pearson Criminal Justice, 2010). Moreover, the maintaining of these "get tough" on crime policies may contribute to the current conditions in which criminologists predict that 1 in every 6 boys and 1 in every 12 girls in the United States will be referred to a juvenile court before their 18th birthday (Pearson Criminal

Justice, 2010). In 2006, approximately 1.3 million arrests were made of youth under the age of 18. By the end of 2006, an estimated 102,400 juveniles were in correctional institutions and other residential programs, a 20% increase from 1999, despite nearly a 19% decline in crimes committed by juveniles during that same time period (Pearson Criminal Justice, 2010).

As a result of these “get tough” penal policy shifts, the United States’ juvenile correctional approach has largely become based upon a quasi-military model of discipline, rules, and ceremony that mirrors the adult penal system (Mackenzie, 1997; Pearson Criminal Justice, 2010; Tewksbury & Mustaine, 2001). These programs rely on harsh penalties in attempting to correct and modify behaviors and attitudes (Abrams et al., 2005; Pearson Criminal Justice, 2010). Yet, in its ideal conception the juvenile justice system is not merely interested in using punishment; the other underlying mission of juvenile corrections is changing the behaviors and attitudes of juvenile offenders by trying to create awareness in youth of the root causes of their criminality, through various forms of therapeutic programs.

Despite public investment in these “get tough” on crime juvenile correctional programs, empirical research suggests that these punitive oriented interventions are not as effective as desired in preventing recidivism. A review of meta-analyses examining correctional interventions of differing lengths reported recidivism rates averaging between 45% and 75% were reported (Lipsey, 1992). The high percentages suggest that for many youth sent to juvenile justice facilities, a significant shift in criminal behaviors and attitudes does not occur. Lapse (1992) reviewed all of the literature on recidivism within juvenile correctional facilities and compiled a meta-analysis which reported that reasons such as inadequate funding, co-occurring issues such as mental health, substance abuse histories, inadequate length of program treatment, and the overwhelming social forces of criminal environments explain the high recidivism rates. In addition, criminologists concur that many of the therapeutic programs offered to juvenile offenders such as Boot Camps, Scared Strait, and Intensive Supervision, have been shown through rigorous evaluations to increase recidivism (Mackenzie, 1997; Pearson Criminal Justice, 2010).

Yet, surprisingly given the disproportionate number of boys in the judicial system, very few studies have looked at how the quasi-military approach of juvenile corrections affects the development of boys’ masculinities and how such prisonized environments may affect program outcomes. Too few studies explore how the quasi-military model of discipline utilized in corrections may conflict with the rehabilitative goals of juvenile facilities and may ultimately hinder treatment outcomes as a result. Also too few studies have examined the relationship between hegemonic masculinity and criminality within juvenile facilities. Specifically, hegemonic masculinity is a way of behaving or acting out the male sex role and is characterized by traits such as anti-femininity, restricted emotions, except anger, and a focus on success, power, achievement, toughness, and aggression (Brannon, 1976; O’Neil et al., 1986; O’Neil, 2008).

The current study aims to fill these gaps by exploring the relationship between juvenile corrections, hegemonic masculinity, criminality, and by examining literature on how institutionalization may mediate the relationship. This study attempts to answer two research questions. The first research question asks if juvenile offenders of power and dominance crimes have a higher endorsement of hegemonic masculinity than juvenile offenders of non-power and dominance crimes. Given previous research that has found both positive and negative relationships between power and dominance crimes and masculinity ideology, I did not make a directional hypothesis. Rather, I hypothesized that there would be a difference between the groups. The second research question asks whether there is a relationship between a youth’s total length of stay in a juvenile correctional facility and their criminal decision making. The current study hypothesizes that youth who have been a resident of a juvenile correctional facility longer will have more negative changes in their decisional balance in regards to criminal thinking, than youth who have resided in a correctional facility fewer days.

Part of exploring hegemonic masculinity, criminality, and the effects of correctional institutionalization on rehabilitation within male juveniles requires an examination of male youth as gendered beings. Implicit in this examination is exploring how masculinity shapes male behavior and experience. Accordingly, the current study is framed through three main theoretical lenses: theory of differential association, social learning theory, and gender role conflict theory. Using these theories as a lens to frame these issues allows for the current study to better explore juvenile males in correctional environments, criminality, and the risks of hegemonic masculinity.

Male Youth in Corrections as Gendered Beings

Sutherland's theory of differential association asserts that individuals become predisposed toward criminality because of an excess of peers that advocate criminal behavior or anti-social thinking. Due to these contacts, a person will tend to learn and accept values and attitudes that look more favorably on criminality (Hagan, 2009). For example, criminologists note that placing high risk youth with low risk youth can negatively impact the low risk youth by virtue of being socialized among more severe anti-social thinking peer groups; thus, often moving those youth into a higher risk category (Pearson Criminal Justice, 2010). While many juvenile corrections attempt to separate youth by risk category, there is often no official policy which insures this. As a result, many nonviolent offenders are pooled with violent offenders, causing higher recidivism rates among the nonviolent offenders. (Hagan, 2009; Pearson Criminal Justice, 2010). This theory adds to the understanding of how longer residency in a juvenile correctional facility may negatively affect youth by virtue of being pooled with a multitude of anti-social peers. Thus, length of stay becomes a hindrance to cognitive changes necessary in criminal thinking to achieve rehabilitation.

Complimentary to the theory of differential association, social learning theory asserts that people are active learners, engaging with and learning from their environments in dynamic ways. Socialization occurs through various agents such as exposure to media, peer groups, parents, differential treatment based on gender, and early influences such as gendered children's books (Bandura, 1969; Kilmartin, 2010). The strength of socialization is dependent upon the amount of exposure to such models, the degree a person identifies with the model, referring to the process in which a person patterns their thoughts, feelings, or actions after another person who serves as a model, and the degree to which a person perceives rewards and punishments and internalizes them positively or negatively (Bandura, 1969; Kilmartin, 2010). Viewed through this theoretical lens, gender roles are the result of gender typing; thus, being socialized to normative male or female behaviors within an individual's larger historical context (Brannon, 1976; Kilmartin, 2010). Social learning theory allows for a better understanding of how hegemonic masculinity can be internalized through socializing agents and how juveniles' identity formation may be negatively influenced by virtue of a punitive correctional environment and residents who endorse hegemonic masculinity. The next step then in understanding how hegemonic masculinity and institutionalized prisonization may negatively influence identity formation in juvenile youth residing in a correctional facility is to understand gender role conflict and hierarchical power structures.

Gender role conflict is a psychological state in which socialized gender roles have negative consequences on the person or others (O'Neil, Helms, Gable, David, & Wrightsman, 1986; O'Neil, 2008). How gender roles are learned, internalized, and experienced, from early childhood to late adulthood, is very complex and idiosyncratic; therefore, gender role conflict is quite individualized (O'Neil et al., 1986; O'Neil, 2008). Gender role conflict occurs when rigid, sexist, or restrictive gender roles result in personal restriction, devaluation, or violation of others or self (O'Neil et al., 1986; O'Neil, 2008). The ultimate outcome of this kind of conflict is restriction of the human potential of the person experiencing the conflict or a restriction of another's potential. Overall, gender role conflict implies cognitive, emotional, unconscious, or behavioral problems caused by the socialized gender roles learned in sexist and patriarchal societies (Brannon, 1976; Kilmartin,

2010; Mankowski & Maton, 2010; O'Neil, et al., 1986; O'Neil, 2008). The current study is interested in the male experience of gender role conflict and how that may contribute to criminality.

Researchers have noted that males experience gender role conflict directly or indirectly in six contexts: when they deviate from or violate gender role norms, try to meet or fail to meet gender role norms of masculinity, experience discrepancies between their real self-concept and their ideal self-concept, based on gender role stereotypes, personally devalue, restrict, or violate themselves, or experience this from others, or violate others because of gender role stereotypes. (Brannon, 1976; Kilmartin, 2010; O'Neil et al., 1986; O'Neil, 2008). When individuals are personally devalued, restricted, or violated because of sexism and gender role conflict, psychological and physical health may be at risk (Brannon, 1976; Kilmartin, 2010; Mankowski & Maton, 2010; O'Neil et al., 1986; O'Neil, 2008). Several studies have asserted that males who more strongly endorse or who are more conflicted over these masculine expectation experience decreased wellbeing and experience increased problem behaviors such as abusing alcohol and other substances, experiencing anxiety and depression, perpetrating violence, using controlling behaviors with partners, using aggression, committing crimes, and not seeking physical and mental healthcare (Brannon, 1976; Connell, 1995; Connell & Messerschmidt, 2005; Courtenay, 2000a; Courtenay, 2000b; Kilmartin, 2010; Kimmel & Messner, 2010; Mankowski & Maton, 2010; Messerschmidt, 1999; Messerschmidt, 2000; O'Neil et al., 1986; O'Neil, 2008). Furthermore, a sizable body of theory and research accumulated on the male gender role demonstrates that males have poorer attainment of quality of life than women, in physical and mental health, in safety, and in education (Burke et al., 2010; Center of Disease Control and Prevention, 2010; Courtenay, 2000a; Kilmartin, 2010; Kimmel & Messner, 2010; Mankowski & Maton, 2010; National Center for Education Statistics, 2010). While these outcomes have not been linked to biologic gender, these outcomes have been linked to the extent to which individual males endorse beliefs and behaviors that define hegemonic masculinity (Courtenay, 2000a; Courtenay, 2000b; Kilmartin, 2010; Mankowski & Maton, 2010). Specifically, research in this area has examined differences among males in hegemonic masculinity, which again is characterized by anti-femininity, restricted emotions, except anger, and a focus on success, power, achievement, toughness, and aggression (Brannon, 1976; O'Neil et al., 1986; O'Neil, 2008). Moreover, gender role conflict is a multidimensional and complex process; thus, resolving gender role conflict is an ongoing process of conscious-raising over the life span (Burke et al., 2010; Mankowski & Maton, 2010; O'Neil, 2008).

The risk factors resulting from gender role conflict is cause for serious concern, in part because hegemonic masculinity is also defined as the idealized form of masculinity at a given place and time, so the pressure to conform to hegemonic masculine normative behaviors within patriarchal societies is high (Connell, 1995; Connell & Messerschmidt, 2005). Moreover, the concept of hegemonic masculinity presumes the subordination of non-hegemonic masculinities. As such, hegemonic masculinity is a type of hierarchy; in essence it is a social power structure (Connell, 1995; Connell & Messerschmidt, 2005; Hagan, 2009; Messerschmidt, 1993; Messerschmidt, 1999; Messerschmidt, 2000).

The hierarchical nature of hegemonic masculinity is an important concept when considering correctional institutions, which are also hierarchical, social power structures, utilizing control over residents through punitive punishment (Pearson, 2010; Tewksbury & Mustaine, 2001). This suggests that the commonalities between institutionalized settings and hegemonic masculinity are complimentary systems, implying a reciprocal reinforcement. Furthermore, when combining a punitive and a rehabilitative program for juveniles, the reciprocal reinforcement of these frames may condition youth in organizing themselves along these hierarchical lines. This reciprocity highlights the potential negative impacts of correctional institutionalization on identity formation, criminal thinking, and rehabilitation. In addition, several studies have linked particular patterns of aggression and violence with hegemonic masculinities (Connell, 1995; Connell & Messerschmidt,

2005; Messerschmidt, 1993; Messerschmidt, 1999; Messerschmidt, 2000; Hagan, 2009; Pearson Criminal Justice, 2010). Moreover, some studies have indicated that marginalized males experiencing gender role conflict may attempt to compensate for their subordinated status by constructing alternative forms of masculinity, or by attempting to compensate by exemplifying overblown hegemonic masculine traits in the hopes of achieving higher status within peer social hierarchies (Connell, 1995; Connell & Messerschmidt, 2005; Messerschmidt, 1993; Messerschmidt, 1999; Messerschmidt, 2000). Following is a literature review concerning hegemonic masculinity and crime and the effects of prisonized institutionalization on identity formation and criminality.

In a study utilizing the-life-history method in interviews with adolescent boys in juvenile facilities with offenses for assaultive violence, sexual assault, and gang involvement, Messerschmidt (1999) found a direct link between school dynamics/social hierarchies and the internalized identities of the boys involving the body and its relation to masculine construction, which were found to be the underlying motivations for their criminal behaviors. Important to note is that adolescence is also a time when bodies are increasingly subject to peer inspection, and physically small and less muscular boys are often labeled "sissies" and "fags" (Messerschmidt, 1999). Messerschmidt (1999) found that the boys who did not fit into or embody hegemonic masculinity often compensated in dysfunctional and destructive ways, such as expressing dominance through violent sexuality. Moreover, at risk boys who did physically embody hegemonic masculinity, such as being tall, muscular, or athletic often overemphasize their masculinity in destructive ways, such as fighting, risk taking, and displaying criminal behaviors in an attempt to maintain their status or get respect from their peer groups (Messerschmidt, 1999). Messerschmidt (1999) noted that a male adolescent sex offender confessed that the motivation behind the molestation of his cousin was to feel strong, competent, powerful, and to be sexually active, which were all important to be accepted as a "cool" guy at his school. Messerschmidt (1999) discusses how the adolescent boy did not meet the hegemonic standard of masculinity in school, was terrible at sports, and overweight. The adolescent boy felt that being sexually active was a way that he could make up for his deficiencies in masculinity and attain greater acceptance within his peer groups.

Messerschmidt's (1999) study illustrates ways in which marginalized individuals act out in criminal ways to reassert their status, highlighting how the expectation to be "tough," "sexually active," and "aggressive" as a male can become ways in which marginalized individuals use those very traits against others to reaffirm their masculine identity.

The connection between crime and hegemonic masculinity is further made in another study by Messerschmidt (2000) in another article utilizing the-life-history method in interviews with adolescent boys in juvenile facilities. In particular, Hagan (2009) and Messerschmidt (2000) note that gang activity is explicitly masculine in that it emphasizes daring, active mastery, achievement, exploit, aggressiveness, and pursuit. In this, the delinquent gang acts in ways that reflect these aspects of the male sex role. Connell and Messerschmidt (1995) assert then, that arguably the delinquent subculture is an excellent solution for problems concerning the male sex role.

Interestingly though, in a study conducted by Daleiden, Kaufman, Hilliker, & O'Neil, (1998) examining adolescent sex offenders' fantasies through interviews, researchers found that contrary to clinical lore, criminal activity may be associated with suppressed levels of non-deviant fantasy rather than elevated levels of deviant fantasy. This may indicate that while sex offenders may engage in a type of power and dominance crime, it may not be connected to internalized hegemonic masculine beliefs. Rather, it may be connected to the degree of suppression and marginalizing experienced by the offender. Moreover, it illustrates the complexity in understanding youths' motives for committing sex crimes.

South and Wood (2006) also had compelling findings from prisonized males in a study looking at power structures, utilizing a randomized sampling method. Specifically, the study aimed to see if

perceived importance of social status in prison motivates bullying, and whether moral disengagement and prisonization influences the relationship. Based upon participants social status within their correctional environment they were labeled either as a bully, a victim, or a bully/ victim (South & Wood, 2006). The results showed that overall the presence of bullying is high in prisonized residents. Moreover, the results indicated that prisonized attitudes may instill values such as social status into prisoners, and may result in cognitive distortions such as moral disengagement and bullying. This reinforces the earlier point that the hierarchical nature of prisonized environments and hegemonic masculinity may reinforce the other. Moreover, moral disengagement mediated the relationship between social status and bullying, which is in alignment with what Messerschmidt (1999; 2000) found. The study reported that participants labeled as a bully were found to be more prisonized than those labeled as a victim, suggesting that length of residency in prisonized institutions contributes to increased behaviors overtime linked to bullying: such as certain aspects of hegemonic masculinity, importance of social status, and moral disengagement (Connell, 1995; Connell & Messerschmidt 2005; Messerschmidt, 1993; Messerschmidt, 1999; Messerschmidt, 2000; Pearson, 2010; South & Wood, 2006). Furthermore, South and Wood (2006) found that prisonization also revealed a positive relationship with moral disengagement, suggesting that length of residency predicts increased moral disengagement. The complex feedback loops of prisonization, length of residency, moral disengagement, social status, and bullying, all indicate a reciprocal relationship which enhances the other, suggesting that correctional hierarchies and hegemonic masculinities may contribute to criminality and not rehabilitation.

Along the lines of Messerschmidt (1999, 2000) and South and Wood (2006), Abrams, Anderson-Nathe, and Aguilar (2008) conducted a study examining how young men's gender identities are constructed in the context of juvenile justice system. Researchers found a disturbing reinforcement of an overarching hegemonic masculine milieu within the correctional facility. The researchers also consistently observed explicit validation of dominant and competitive masculine ideals and behaviors by staff in enforcing a hierarchy of hegemonic masculinity. Researchers also observed how the institutionalized setting and staff played a crucial role in suppressing resident's individuality and expressions of their own masculinities (Abrams et al., 2008). These themes occurred in subtle and not so subtle institutional mechanisms, such as ways the staff interacted with residents, or instances of staff not intervening in residence's interactions with each other. Unfortunately these findings are not outliers.

In another study conducted by Abrams and Hyun (2009) examining identity construction in three juvenile facilities through interviews and observations, the juvenile justice correctional institutions were presented as covertly and overtly imposing an underlying set of expectations reinforced through implicit values and norms of the American dream discourse, which attempts to enforce a middle class, law abiding citizenship and identity among incarcerated young males in these three facilities. In addition, Abrams, Kim, and Anderson-Nathe (2005) conducted another study in a county juvenile correctional facility and found paradoxes of treatment that became apparent through interviews and observations of juveniles. The researchers noted that on an ongoing basis, when staff were operating in the treatment frame, program staff encouraged residents to express their anger as a tool for personal growth and healing. However, researchers also found that the rigid program structure required that staff simultaneously exert a high degree of control over these emotional expressions. Moreover, the study found that the quasi-military correctional nature of the facility mandated that staff respond to some extreme emotional displays punitively or dismissively (Abrams et al., 2005). The researchers also found that residents as a result of these conflicting messages, became caught in a tangle of expectations and messages concerning emotion, which resulted in confusion about when, how, and where is it appropriate to utilize their therapeutic tools (Abrams et al., 2005). Lastly, researchers found that a significant proportion of residents became acclimated to the tight system of rules and regulations and adapted themselves to the facility and structure; thus, becoming more prisonized. These residents became aware that they could expedite

their release date if they fooled the staff into believing that they were sincerely working on their therapeutic treatment goals. These conflicting expectations creates a link between personal disclosure about family issues and advancement in program levels, which was found to cause some residents to invent family issues, or to adopt a therapeutic discourse to fulfill the program requirements (Abrams et al., 2005).

Current Study

In addition to the literature review, it is also important to note that the current study utilizes survey data from Ohio Department of Youth Services (ODYS), where a civil suit filed in 2008 led to an investigation of the Ohio Department of Youth Services (ODYS). This investigation found the juvenile detention facilities to be in a constitutional violation of the 8th Amendment on several counts: use of unnecessary force, use of excessive isolation and seclusion, use of excessive discipline, inadequate mental health, medical, and dental care, inadequate education services and structured programs, broadly inadequate training of staff, unsafe living conditions, and dysfunctional grievance system (Cohen, 2008). Data collection for this study occurred in 2009, after the lawsuit, but it is unknown how many juveniles from the class action lawsuit remained in Ohio Department of Youth Services (ODYS) at the time the surveys were administered. Although the findings of the class action lawsuit were extreme, it is important to note that some of the investigation revealed similar findings in the literature review. Specifically, the class action lawsuit found similar findings to what criminologists have asserted are the detrimental impacts of the “get tough” punishment ideology that has swept across the United States (Pearson Criminal Justice, 2010). Criminologists have asserted for some time that excessive punishment and military styles of discipline are not actually effective in reducing recidivism; rather, such tactics and policies can actually increase recidivism (Pearson Criminal Justice, 2010).

Given the disturbing literature on residency within juvenile corrections, hegemonic masculinity, and criminality, the current study examines relationships between hegemonic masculinity, crime, prisonization, and criminal thinking. In this endeavor, the current study addresses two research questions. First, is there any difference in endorsement of hegemonic masculinity between juvenile offenders of power and dominance crimes and juvenile offenders of non-power and dominance crimes? I hypothesized that there is a difference between these two groups. Second, is there a relationship between a juveniles’ length of stay within a correctional facility and change in individual decisional making in regards to criminal thinking? I hypothesized that youth who reside in a juvenile correctional facility longer will have more negative changes in their decisional making in regards to criminal thinking, than youth who have been in a correctional facility fewer days.

Methods

Participants

Male residents of the Ohio Department of Youth Services (ODYS) participated in the study. Youth from four facilities were included: Ohio River Valley Juvenile Correctional Facility (ORV), in Franklin Furnace, Ohio; Indian River Valley Juvenile Correctional Facility (IRV), in Indian River Valley, Ohio; Circleville Juvenile Correctional Facility (CV), in Circleville, Ohio, and Cuyahoga Hills Juvenile Correctional Facility (CH), in Cuyahoga Hills, Ohio.

The first research question was restricted to participants whose institutional records included a crime and to those who had taken a (“pre”) Adolescent Masculinity Ideology Relationship Scale (AMIRS) survey. The second research question was restricted to participants whose institutional records included their total length of days within ODYS and to those who had taken a (“pre”) and

("post") Decisional Balance Scale (DBS) survey. As a result of the differing inclusion criterion of each research question, the sample sizes of each question are different.

The first research question was addressed by a sample of $n = 452$ male youth age range: 13 – 20 years, M age = 17 years. Of these 452 participants 3% identified as Latino, 4% identified as other, and 5% identified as more than one ethnicity, 6% identified as Native American, 20% identified as white, 67% identified as African American. When asked who the participant had lived with prior to being admitted to ODYS, 2% reported living in a group home, 3% reported living with a foster parent, and 4% reported more than one of then the above living options, 6% reported living with other family, 8% reported living with other, 8% reported living with their father, 13% reported living with their mother and father, 55% reported living with their mother. The average length of residence in ODYS facilities was 569 days ($SD = 401$).

The second research question was addressed by a sample of $n = 343$ male youth age range: 14 – 20 years, M age = 17 years. Of these 343 participants, 5% identified as Native American, 3% identified as Latino, 5% identified as more than one ethnicity, 6% identified as other, 19% identified as white, and 69 % identified as African American. When asked who the participant had lived with prior to being admitted to ODYS, 1% reported living in a group home, 4% reported living with a foster parent, 6% reported more than one of then the above living options, 8% reported living with their father, 8% reported living with other family, 9% reported living with other, 13 % reported living with their mother and father, and 51% reported living with their mother. The average length of residence in ODYS facilities was 630 days ($SD = 431$).

Procedure & Materials

Participants were administered a paper and pencil survey by ODYS staff in June, 2009 ("pre"), and again after 10 weeks between August and September, 2009 ("post").

Type of Crime

To assess whether the type of crime committed by each youth that resulted in their sentence to an ODYS facility was a power and dominance crime, this study utilized institutional records that were obtained through a community partner at ODYS. Specifically, crime type was coded based on a literature review of hegemonic masculinity and crime (Connell & Messerschmidt, 2005; Hagan, 2009; Kilmartin, 2010; Messerschmidt, 1993; Messerschmidt, 1999; Messerschmidt, 2000; Pearson Criminal Justice, 2010). Participants were coded as having committed a power and dominance crime if the crime type allowed for an explicit knowing of an occurrence of direct sexual assault or direct physical assault. Thus, attempted rape, rape, gross sexual imposition, assault, felonious assault, domestic violence, premeditated murder, or murder was coded as a power and dominance crime. Each of the above coded power and dominance crime types allows for an explicit knowing of direct violence from the offender to the victim. All other crimes were coded as a non-power and dominance crime such as theft, burglary, robbery, trafficking, receiving stolen property, kidnapping, and complicity to murder, tampering with evidence, gang affiliation, drug use, and vandalism. Each of the above coded non-power and dominance crimes involves ambiguity as to whether direct sexual assault or direct physical assault occurred in cahoots with the committed crime type. For example, kidnapping and complicity to murder were not coded as a power and dominance crime, because the generic crime type of kidnapping does not allow for an explicit knowing of physical or sexual violence. A literature review revealed that convicted offenders of kidnapping offenses often involves holding a person against their will for lack of payment over a drug deal or other forms of monetary motivation, often never resulting in physical or sexual violence; thus, creating an ambiguity over an explicit knowing of direct physical or sexual assault (Pearson Criminal Justice, 2010). Similarly, complicity to murder only implies that the offender

knew of the planned crime, not that they were directly involved in the actual act of the murder itself.

Length of Incarceration

Institutional records were used to obtain participants' total number of days incarcerated within any given ODYS facility.

Masculinity Ideology

Because a measure of gender role conflict among adolescents was not available, youth completed a related measure -- the Adolescent Masculinity Ideology in Relationship Scale (AMIRS; Chu, Porche, & Tolman 2005) to assess their level of endorsement of hegemonic masculine normative beliefs. The AMIRS scale consists of 12 items and measures four major themes: emotional stoicism, heterosexual dominance, sexual drive and physical toughness. The AMIRS survey asks questions such as, "Guys should not let it show when their feelings are hurt" "It's embarrassing for a guy when he needs to ask for help" "A guy never needs to hit another guy to get respect" and "I think it's important for a guy to act like he is sexually active even if he is not." Responses are scored along a 4-point Likert scale with 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree with higher scores indicating greater endorsement of hegemonic masculinity. Internal consistency has been established across different ages of adolescents (seventh grade: Cronbach's alpha=.70) (Chu, Porche & Tolman 2005). In the current study, Cronbach alpha α = .75 at ("pre") and ("post").

Criminal Thinking

Youth also completed the Decisional Balance Scale- Adolescent Offenders survey (DBS-AO; Jordan, 2005). The DBS-AO survey consists of 32 items measuring three variables related to readiness to change criminal behavior: Con, Pro Self, and Pro Other. The Con Scale assesses the perceived negative consequences of ending criminal behavior. It is exemplified by losing respect from peers and family members and diminished self-image. It also includes a loss of financial opportunities and the potential for increased danger. The Con subscale survey asks questions such as "If I stop doing crime I will lose my tough image." The Pro Self Scale assesses the perceived positive internal rewards from terminating criminal activity. Rewards include positive self-image, self-respect, positive relationships with others, and increased safety. The Pro Self subscale survey asks questions such as "If I stop doing crime I will be proud of myself." The Pro-Other Scale assesses perceived benefits to others of ending criminal behavior, such as gaining close, positive relationships with others. Other feelings include the self-respect of others for prosocial behaviors. The Pro-Other Scale subscale asks questions such as "If I stop doing crime the people I care about will trust me." Responses are scored along a 4-point Likert scale with 1 = not important, 2 = of little importance, 3 = important, 4 = very important. It is expected that youth who score higher on the Pro scales than the Con scale are decreasing their criminal behaviors, thus, will be more likely to decrease their criminal behavior in the future. The DBS-AO has demonstrated excellent internal reliability in previous studies, with total summed Cronbach's alpha coefficients ranging from .89 to .91 (Jordan, 2005). In the present sample, the total summed Cronbach α =.82 (pre scores) and α =.92 (post scores).

Results

To answer the first research question, a t-test was computed to determine the baseline difference in AMIRS scores at ("pre") between offenders of power and dominance crimes and offenders of non-power and dominance crimes. Juvenile offenders of power and dominance crimes reported

lower AMIRS scores ($M = 2.13$, $SD = .48$) than non-power and dominance crimes ($M = 2.31$, $SD = .40$). This was a significant difference ($-t = -4.07$, $p = .005$).

To test the second research question concerning whether there is any relationship between length of stay and changes in criminal decision making, juveniles' length of incarceration in ODYS and the difference score between their ("pre") and ("post") Decisional Balance Scale Scores (DBS-AO) 2-tailed correlations were computed. Results indicated a significant correlation between length of stay and change scores on the Con subscale ($r = .17$, $p = .04$). However there was no significant correlation found between length of stay and the Pro-self subscale ($r = -.09$, $p = .21$) or the Pro-other subscale ($r = .03$, $p = .65$).

Discussion

The results of the analysis of the first research question suggest that there is a significant difference in endorsement of hegemonic beliefs between juvenile offenders of power and dominance crimes and juvenile offenders of non-power and dominance crimes. This finding is somewhat in alignment with prior theory and research (Connell, 1995; Connell & Messerschmit, 2005; Messerschmit, 1993; 1999; 2000).

Specifically, these studies collectively suggest that that adolescent boys who have attained hegemonic masculinity by virtue of being a part of a deviant peer subculture, such as membership in a gang, or participation in a drug operation, may have reduced their gender role conflict and as a result experience less cognitive dissonance between their self perceptions and others' perceptions of them. A gang member's peer group may reaffirm the non-power and dominance offender's identity as a tough, fearful individual by virtue of surrounding themselves with their fellow gang members and culture with high frequency. However, adolescent boys who may be attempting to attain hegemonic masculinity by virtue of committing a power and dominance crime such as rape, molestation, or sexual assault, may have a more problematic solution for resolving gender role conflict, due to the solitary nature of the crime, thus, creating more contradictory male sex role expections and as a result more cognitive dissonance between how the power and dominance offender perceives themselves and how others perceive them. For example, Messerschmidt (2000) found that in a case of sexual molestation taking place in the juvenile offender's home that once the adolescent sexual offender went back to school, he was outside of the carefully constructed environment in which he felt powerful and in control and once again represented a subordinate masculinity. As such, the feelings of power and control were brief between more sustained periods of isolation and marginalization; thus, causing larger incongruences between the self-concept and actual self, leading to more severe gender role conflict. The greater degree of gender role conflict may thus indicate a desire to achieve hegemonic masculinity rather than adherence to those beliefs. This in part may explain why offenders of non-power and dominance crimes have a greater adherence to hegemonic masculinity.

The results of the second research question are also significant and suggest that the change scores of juveniles who have resided longer in correctional facilities were more likely to perceive more negative consequences of stopping their criminal behavior, than juveniles who have resided fewer days in the correctional facilities. Specifically in regards to the Con scale, youth over the 10 weeks seem to become more concerned with potentially losing respect from peers and family members, including more concern over a loss of financial opportunities through criminal activities. This finding is in alignment with Sutherland's theory of differential association and social learning theory (Hagan, 2009; Kilmartin, 2010; Pearson Criminal Justice, 2010). Criminologists such as Hagan (2009) have noted the dangers of housing low risk offenders with high risk offenders due to the increase in anti-social thinking among the low risk offenders. Thus, long term residency with anti-social peers becomes a detriment to pro social thinking. However, there was no relationship

between length of incarceration and the difference score in the Pros Self subscale. There was also no relationship between length of incarceration and the difference score in the Pros-Other subscale.

The finding that length of stay is associated with less change in criminal thinking highlights the issues of combining a quasi-military punitive approach to juvenile corrections and maintaining rehabilitative treatment goals, which seemed to imply that length of residency in juvenile corrections can predict moral disengagement, greater endorsement of criminal behaviors, desire for social status, lying, and bullying. Several prior studies also suggest that many juvenile correctional facilities reinforce hegemonic masculinity and that the competing goals of correctional rules and rehabilitation hinder residents' ability for authentic growth (Abrams et al., 2005; Abrams et al., 2008; Abrams & Hyun 2009; Cohen, 2008; Pearson, 2010; South & Wood, 2006; Tewksbury & Mustaine, 2001).

If empirical research informs society that aspects of hegemonic masculinity correlates with aggression, violence, criminality, higher health risks, and lower quality of emotional life, and that prisonization can lead to bullying, lying, moral dis-engagement, and increased criminality (Messerschmidt, 1993; Messerschmidt 1999; Messerschmidt, 2005; South & Wood, 2006; Kilmartin, 2010; Pearson Criminal Justice, 2010), then policy makers need to find new ways to rehabilitate juveniles. Although, it is important to point out that not all juvenile corrections resemble the ones described in the literature review, it seems that there is enough prior research to suggest that juvenile corrections may not be fulfilling their rehabilitative goals.

I suggest that to truly grapple with the issues of juvenile crime and delinquency that are challenging our society today, the United States has to think in terms of primary prevention/public health and not just treatment. By framing the discussion within this context, the United States can better deal with the root causes of juvenile crime and delinquency and not merely their symptoms. The implications of this study are cause for concern and further research is needed to add to the insights of the current study with the goal to inform future policy. Research is needed to ascertain the validity of juvenile corrections as an institution in which rehabilitation can occur. My findings suggest that how the male sex role is experienced by males may contribute to the types of crimes they commit. Research indicates that individuals with more androgynous character traits are more psychologically healthy than those who strongly conform to stereotypical female or male gender roles. A primary prevention policy that educates children on how gender roles are flexible and constructed by society, may increase the awareness of the dangers of gender role conflict and crime.

Limitations and Future Research

It is important to note that the causal relationships among the variables were not demonstrated in this study; rather, the results highlight correlations and relationships. As always there are limitations to such studies since there was no control group or random assignment. Another limitation to this study is the lack of life-histories from the juveniles who completed the surveys. Such histories provide a deeper understanding of why they committed the crimes they did and how certain offenses may be connected to hegemonic masculinity or gender role conflict. Without life histories, such connections are difficult to ascertain. Additionally, the current study cannot make any certain claims to youth outside of the Ohio Department of Youth Services; rather, the results highlight that a significant difference was found between these two groups and that the higher endorsement of hegemonic masculinity in offenders of non-power and dominance crimes may be connected to the types of crimes juveniles commit and the social nature of those crimes.

More research is needed to gain a deeper understanding of the relationship between gender role conflict, adherence to hegemonic masculinity, and crime type. Specifically, future research needs

more longitudinal studies which assess change in criminality within residents of juvenile facilities. Also, future research needs to assess the effects of prisonization on hegemonic masculinity, and assess the relationship and motives between gender role conflict and committed crimes. With a deeper understanding of why juveniles commit certain types of crimes, prevention programs and social and correctional policies can be put in place to help mitigate the potential relationships between criminality and gender role conflict.

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Spinoza and Virtue: The significance of habituation to a virtuous character to the ethics of the *Ethics*

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Introduction

Although scholars disagree on the specific kind of ethical theory in Spinoza's work, they agree that there is a connection between certain types of knowledge and one's ability to live the good life.¹ Specifically, it is in how one is to move toward control of their emotions that the connection between knowledge and ethics, or the good life, becomes clear. The connection is made by understanding that, dependent on what type of knowledge one is operating on, one can move closer, or further away, from control of their emotions and a human perfection where the good life is to be achieved. Spinoza's method to achieve control over one's emotions, much like the modern practice of psychotherapy, asserts that through knowledge of one's own emotions coupled with knowledge of the world one finds herself in, one can move toward a self-determined character where one acts and does not react. Becoming purely active and self-determined occurs by the development of virtuous states of character in a movement through Spinoza's hierarchy of knowledge where one obtains the highest form of knowledge: intuitive knowledge. In a state of pure activity based on intuitive knowledge, one becomes the free person and lives with a sense of eternal blessedness, a non-transitory joy. In this state, human perfection and the good life are to be found.

Achieving Spinoza's perfected human state of eternal blessedness, or becoming the free person, is a challenging and uncommon thing to achieve.² Though Spinoza is famously explicit in saying the model is 'difficult and rare' to achieve, it still is an achievable goal and not merely an optimal ethical placeholder (5P42S).³ While Spinoza claims that becoming the free person is a rare but achievable goal, he also seems to claim that it is one achievable by anyone who sets themselves toward it: "The greatest good of those who seek virtue is common to all, and can be enjoyed by all

¹ This is seen in the disparate interpretations in Aloni (2008), Curley (1973), Garrett (1996) and Rosenthal (2001)., Curley likens Spinoza's system to a sort of deontology (although he uses the term hortatory ethic) and Garrett makes the claim that his work can align with a sort of deontology, consequentialism, emotivism and virtue ethics. Others see that Spinoza's work belongs to virtue ethics (Rosenthal) or a *eudaimonistic* ethical theory (Aloni). To note: this work is inspired by my own reading of Spinoza as a type of virtue ethicist, and this work is part and parcel to understanding that interpretation.

² To note: 'Eternal Blessedness' and the 'free person' are connected, in my opinion, but not synonymous as this sentence may seem to make them. The sense of blessedness one achieves comes by way of the intellectual love of God that arises from acting by intuitive knowledge, which is virtue itself (5P42). The intellectual love of God, which arises from intuitive knowledge is eternal (5P33) and blessedness consists of the mind's perfection (5P33S), thus implying that one who has this eternal blessedness has achieved a perfected mind and would model the ideal free person who operates via intuitive knowledge. Spinoza does state that 'blessedness' is something that one can enjoy the more one uses intuitive knowledge, thus implying that it is not necessarily something constant (5P42). Although he states earlier: "From this we clearly understand wherein our salvation, or blessedness, or freedom, consists, namely, in a constant and eternal love of God..." (5P36S), which contestably requires one's intellectual love of God to be something constant, but more importantly this statement aligns one's *freedom* with one's *salvation* and/or *blessedness*. If one were to achieve this difficult 'salvation', being free from control of the emotions and feel a constant intellectual love of God, as I understand what salvation would consist in for Spinoza (by 5P36S), then this would entail becoming the free person. Spinoza, in 5P42, never explicitly states that free person is the one who has eternal blessedness, however I believe it can be adequately inferred, as the free person is the ideal who acts from intuitive knowledge naturally and constantly, as opposed to the person of reason who must 'work' to be free, or experience a sort of freedom. This distinction between the person of reason and the free, or intuitive, person is more clearly dealt with later in the paper.

³ Herman DeDijn promotes this position, claiming that without importance being put on intuitive knowledge, and without the realization of the free person, the *Ethics* cannot be fully realized. Further, stating that without [becoming] the free person who uses intuitive knowledge that one is stuck with the sorrows of reason. "Indeed, victory over the passions seems to require a *development* in our knowledge that goes beyond the sort of knowledge of the rational man talked about in *Ethics* IV." (p. 39).

equally." (4P36). The greatest good is found in a knowledge of God that drives one's activity, leads one to become the free person, and to experience eternal blessedness (5P25, 5P42). This example illustrates a tension of the *Ethics*: the greatest good is to be found by all who seek this virtue in the proper manner, but only a few who seek this virtue in the proper manner will achieve the greatest good. However, after careful examination there is no tension to be found, as I will show, because Spinoza transitions from what he terms the 'greatest good' regarding knowledge from reason, in Part Four, to intuitive knowledge, in Part Five. In this change of what underlies the greatest good Spinoza seems to split his *Ethics*, or ways in which one *is* ethical through her use of virtue, into two parts. One, in which the ethical behavior only occurs by means of a sort of struggle and a practice to make that struggle, one's bondage to the emotions, easier to navigate, which thus increases one's happiness over sadness. In the second part, ethical behavior, or virtue, simply exists and is produced naturally or seemingly effortlessly, as is seen in the free person, who is in a constant state of joy.

The problem addressed in this work is how one can become the free person who only, or primarily, lives by intuitive knowledge. I argue that it is so near impossible or that so few could obtain having a perfected intuitive knowledge that in advocating one's ability to achieve this ideal Spinoza creates a model of ethical behavior that is far outside his audience's reach. Further, focusing on this goal of the *Ethics*, or in seeing that the ethics of *Ethics* is only fully realized through becoming the free person, diminishes the value of the pragmatic ethics found in habituation to the virtuous states of character of *tenacity* and *nobility*.⁴ The goal of this work is to highlight that Spinoza's conception of the free person should be seen as a guide in one's virtuous activity, and that the genuine realizable good life is to be found in the person of reason's development and practice of *tenacity* and *nobility*.⁵ Thus, habituations to certain states of character are of prime importance to the ethics of the *Ethics*.

To defend my thesis I first provide a glimpse of Spinoza's *Ethics* and what concepts or propositions form the foundation of this discussion. Next, I will discuss the link between the types of behavior one produces, how free, or self-determined, a person is, with Spinoza's types (or account) of knowledge.⁶ After understanding these positions or relations, and what constitutes them, through Spinoza's propositions, I will discuss the problem of achieving a perfected intuitive state, or becoming the free person, as well as the aforementioned tension of Spinoza seeming to claim that the virtuous state of the free person is something that can be common, or achievable, to all who set themselves toward it. Part of the goal of this work is to illustrate why it is that a fully realized intuitive 'state' is difficult to obtain, thus making it only achievable for the rare few and not the many, as one would hope an ethical model would be set to accomplish. Another, goal of this work is to highlight the importance of habituation to Spinoza's system and to illustrate that the ethics of the *Ethics* need not be realized in the end goal of the free person, but in the process of working toward that goal by use of reason. What is important in realizing the ethics of the *Ethics* is to use reason to habituate and then practice certain states of character.

⁴ The pragmatic goal, as mentioned earlier, is in the sort of psychotherapy that occurs as a part of practice of habituation to *tenacity* and *nobility*. While many scholars have illustrated Spinoza's connection to the modern practice of psychology/psychotherapy, such as Curley (1988), De Dijn (2004) and Jarrett (2007), there are also those who practice and promote it such as Dr. Donald Robertson (2009). In addition to psychotherapy, there are those who see the contemporary benefit in Spinoza's ethics, such as Aloni. His paper sets out to show how conceptions from Spinoza's eudaimonistic ethical system can create the foundation for an "empowering and liberating pedagogy".

⁵ Certainly, for Spinoza, the good life is to be found in the person of reason as well as the free person. However, what will be shown later is that the good life that the person of reason experiences is only a modicum of what would be experienced by the free person and that 'true virtue' can only exist in the free person.

⁶ This idea developed by reading Garrett, "...certain kinds of *behavior* become more prevalent as one becomes more free—that is, they vary proportionately with freedom. They do so because they are products of human virtue and the use of reason, each of which renders us relatively more free, more able to act from our own nature rather than be determined by external causes." Added emphasis. (Garrett, 1996, p. 289)

Casual Determinism and Virtue

Spinoza defines virtue in the Fourth Part of the *Ethics*⁷ in the following:

“By virtue and power I understand the same things, that is (by 3P7), virtue, insofar as it is related to man, is the very essence, or nature, of man, insofar as he has the power to bring about certain things, which can be understood through the laws of his nature alone.” (4D8)

At first glance this definition of virtue leaves something to be desired. Acting by one's own nature seems to be the sort of thing people naturally have the power and inclination to do, given a free will. For Spinoza, there is no such freedom and like many of his terms one must understand this conception of virtue within the context of his philosophical system. Specifically, one must understand virtue within his account of causal determinism and our human bondage to fortune and the emotions.

In part one of the *Ethics*, one learns what Garrett calls a central feature of nature for Spinoza, which is the relationship between Nature (God)⁸ and all individual things, or the division between substance and modes: “Whatever is, is in God, and nothing can be or be conceived without God.” (1P15) (Garrett, 1996, pg. 270). The implications of this are that people have a direct and intimate relationship not only with Nature, but also with all things that exist in Nature. This relationship means that one's actions can be conceived as being an expression of Nature, but also that one can have a direct natural way of participating in the divine. From one's intimate link to Nature comes Spinoza's necessitarianism, which claims everything that has occurred since the very first cause, Nature, has unfolded in a determined manner and those things as they are, or have been, could not have occurred in any other way (1P29). This view is the basis for Spinoza's causal determinism. To be free is to be the sole cause of one's actions or existence and by this only Nature can be truly free (1D7), as Nature is the first and continuing cause of everything. People, as with all other things, are not free, or do not have a free will, and every person's mind is determined by prior causes (2P48). As he rejected the Cartesian idea of an infinite free will, he also rejected Descartes' mind-body dualism. Spinoza parallels modes of thought to modes of extension, which entails the anti-dualist conception of the identity of the mind to the body (2P7S). This move by Spinoza also naturalizes a person's affects (emotions) by making their occurrence identical to corresponding states of the body. This naturalization of one's emotions is important to note as one will find that emotions will have a direct bearing on the ability, or inability, to be active in the world or to be free. It is in this active movement to be free that one will find Spinoza's concept of virtue.

One's ability to experience some sort of freedom, or to act over being passive, relates to adequate/inadequate ideas and adequate/inadequate causation. Adequate ideas are defined as an idea that excludes external things in its understanding and has a clear and true understanding of its object in itself (2D4). Inadequate ideas are those that are confused or not fully and clearly known. Passions, or passive emotions, rely on confused or inadequate ideas, in which one does not fully understand why she feels the way she does or why she is 'acting' a certain way. One can only be said to be active, or the author of one's actions, when they use adequate ideas (3P3). One must understand adequate/inadequate causation through the essential piece of Spinoza's *Ethics*, the conatus. The conatus is simply each singular thing's striving to persevere in their being (3P6) and this striving is the essence of each individual thing (3P7). A thing can only be active when it is the adequate cause of effects using, or through, its own nature when it clearly and distinctly understands the effects. Further, it is passive when it is the inadequate, or partial, cause of effects of things through its own nature (3D2). In addition, being active is in direct relation to furthering

⁷ I use the Curley's (1994) translation of the *Ethics*.

⁸ God and Nature are synonymous for Spinoza; as God is simply the first cause, and complete eternal infinite totality and creation of, Nature. I will use Nature in this essay over God.

one's own perseverance, *conatus*, whereas in being passive one cannot further their perseverance. When a person is aware of their striving, in mind and body, and moves toward specific things that will aid in promoting, or furthering, her striving, this awareness is known as the affect (emotion) of desire. Other affects that directly relate to the promotion, or hindrance, of one's striving are joy and sadness and their derivative emotions. Joy and sadness are defined as those things that increase (joy) or decrease (sadness) one's activity and/or capacity for perfection (3P11S).⁹ It is important to note that there are varying degrees and types of joy and sadness, but that of all the emotions one may experience can be related to joy, sadness, or desire. In turn these can be related to one's activity or passivity.

A person's activity or passivity comes down to her relationship to external causation. External causes can be understood as those things that compel or constrain one's actions in this or that way. They are essentially anything of which an individual cannot be said to be the adequate cause, or author. One can see it as fortune (or luck/happenstance), as in other people's actions or perhaps the events from a natural disaster. External causes also are the passions, which when not understood, go unchecked and lead one passively to act rather than acting from knowledge of the cause and oneself as the cause. These external causes, whether they are fortune or passions, are always looming. One's *conatus* (or striving) can, and will be, always subject to the force of the external causes (4P3). While clearly one cannot have control over other people or the events of Nature's unfolding, it seems that they can have control over their emotions and their actions from these events. Both the Stoics and Descartes thought that people could have absolute control over the passions¹⁰, but Spinoza claims one is always subject to them—one can only do their best to 'accommodate' oneself to them (4P4C). It is in this idea where one finds his account of human bondage to external causation as expressed in one's bondage to the passions.

It is important to notice the intimate relationship between virtue and the *conatus*, as virtue is nothing other than acting by the laws of one's own nature (self-determination) and one's striving to preserve in her being (*conatus*) can only be furthered by the laws of one's own nature. Spinoza states that the *conatus*, or one's striving, is the first and only foundation of virtue and that without it one could not conceive of virtue, or virtuous activity (4P22C). It is in the ability to use one's power, or virtue, that one finds the cause of her happiness. When one considers her power of acting she feel joy, or some variation of it, and feels this joy the more she imagines her power of acting, and/or being praised (3P53, P53C). One should remember that the happiness one feels from her power of acting is not just in the action itself, but in what was necessary for it to occur. Namely, this happiness is in one's knowledge of the necessity of all causes relating back to, and being a part of, the first cause Nature. When one thinks about the awesomeness of the totality of the Universe, and oneself within it, actively [self-] determining new causal chains, a person feels a certain type of joy. In this one can see how it is that Spinoza claims we do not need anything else to cause the desire to be virtuous in his sense of the term: "...we ought to want virtue for its own sake, and that there is not anything preferable to it." (4P18S)

The requirements for virtue are in understanding one's determined nature, one's bondage to external causation and obtaining adequate knowledge. Acting from virtue is nothing other than participating in a certain way of living by the guidance of reason¹¹ from the basis of seeking one's own advantage (4P24). In this one must understand the mind as the proximate cause, or that the

⁹ When discussing the emotions the terms *affects* and *passions* are used by Spinoza and I tend to use all three: *affects*, *passions* and emotions. However, it should be noted that an affect can be understood as an active emotion—one that is clearly, or adequately known, and can be related to a person's activity, or being free. Whereas, a passion is understood as a passive emotion, where one doesn't know its cause clearly and is passive to the 'pull' or force of the emotion.

¹⁰ Spinoza notes this in 5Pref, "...the Stoics thought that they depend entirely on our will, and that we can command them absolutely" and referring to Descartes' position, "...since the determination of the will depends only on our power, we shall acquire an absolute dominion over our passions, if we determine our will by firm and certain judgments..."

¹¹ The guidance of reason will be further explained in the next section through the prescriptions of reason.

thing and/or effect must be understood by one's mind clearly and distinctly to be an action, or exercise of virtue (4P23). If not, one is acting passively. This conception of virtue promotes and insists upon knowledge and understanding as a basis to move toward a way of living that promotes the flourishing of the individual and community alike. This can be seen in what Spinoza claims reason strives the most for, understanding (applied knowledge), as it is the most useful thing to reason (4P26). One cannot act without understanding (3P3). Understanding promotes acting toward one's advantage, or one's striving, and this is virtue itself. Thus, understanding becomes the foundation for virtue (4P26). The greatest knowledge, or understanding, we can have is knowledge of Nature. It is natural that knowledge of Nature is the greatest good as Nature contains everything and everything true,¹² so one's greatest virtue is to understand Nature (4p27). For Spinoza, this greatest good is not something lofty of which few can have understanding, but is something that can be enjoyed by all people (4P36). The more that a person comes to understand Nature and seek out virtue the more virtuous she becomes and the more it is that she wants to share this joy with others (4P20, 4P37). It is in one's, "...desire to do good¹³ generated in us by our living according to the guidance of reason, I call morality."(4P37S)

Thus far his account of virtue seems solely egoist, and largely it is. However, Spinoza claims it is ridiculous to think that a person could move to a greater perfection on her own. The individual mind alone does not, and will not, provide one with all that she needs to survive and thrive. All individuals need other things and people to do this. In one's seeking to thrive, or flourish, reason dictates that one seek out those things which agree with one's nature, or are not contrary to it, to aid in promoting one's advantage. What is most useful to people are other people and specifically other people who use reason (4P18S, 4P35). What would be ideal, considering this, is that all people agreed in natures, or were rational, so that all could join together, to form one whole, which worked toward a common advantage.¹⁴

It has been established that people exist as singular things in an infinite chain of causation bound by external causation to act in determinate ways and one must work to understand how it is that she can experience some sort of freedom via her virtuous activity. Spinoza seems to offer two avenues for one to move toward experiencing this freedom, and hopefully a perfected human state where this sense of freedom is constant. The first, is in the prescriptions of reason (4P18S), in which one is guided through reason's demands so that she may increase her power of acting through understanding some guiding precepts. The second, and intimately linked to the first, is in the power of the mind over the affects (5p10S, 20S), where methods of habituation that utilize reason's precepts are given. Specifically, through knowledge of oneself, and through habituation to ways of thinking or ordering one's thoughts, a person can moderate the emotions and their power over them. Both of these methods to virtue, or freedom, look to the model of the free person as a height of human excellence and use the two strengths of character, *tenacity* and *nobility* toward this goal. In the next section, I will explain, through the three types of knowledge and the behaviors or actions that occur by their use, *tenacity* and *nobility* and their application in moving toward becoming the free person.

Three types of knowledge and virtuous actions

¹² If one knows, or has, some knowledge of Nature, then that would constitute an adequate or true idea.

¹³ Good is defined in 4D1, "By good I shall understand what we certainly know to be useful to us." But good (and evil) is also understood more clearly in 4P27, "We know nothing to be certainly good or evil, except what really leads to understanding or what can prevent us from understanding." In this one can see our desire to do good in our aiding others in their striving through understanding (knowledge), or in our friendship creating joy which aids them in being active toward understanding.

¹⁴ This ideal is more completely treated in the *Theological Political Treatise* relating to the ideal state, a perfected democracy.

In understanding the three types of knowledge in Spinoza's hierarchy it is important to note a difference between understanding the definitional sense of the types of knowledge and the behaviors that are produced as a result. In the proceeding I will first briefly explain the definitions of the three types of knowledge, then move to a discussion of their relation to virtuous activity.¹⁵ First in this hierarchy, and the only cause of falsity, inadequate or confused ideas, is opinion or imagination, which is based on such things as reading, remembering, and forming ideas of things from random experience. The second type is reason, which is based on an understanding of the common properties of things. Knowledge connected to reason can be found in principles in common in mathematics, or universal notions (2P40S1), but generally reason is certain ideas that are common to all people (2P38C). It is in understanding the general properties of things that one can move to knowledge of the specifics that fallout from the body of common knowledge. Knowledge of specifics occurs when one has amassed a large body of adequate knowledge based on reason and can deduce adequate knowledge about singular things from the universals found in reason (2P47S). Knowledge of the specifics is unique to the third type, intuitive knowledge, which "...proceeds from an adequate idea of the formal essence of certain attributes of God to the adequate knowledge of the [NS: formal] essence of things." (2P40S2)¹⁶ Intuitive knowledge consists in having a certain body of adequate knowledge (ideas) of Nature (the universe and its workings) so that one can naturally infer, or intuit, other adequate ideas about the properties (essences) of related things. Moreover, by understanding the essences, or specifics, of things as they pertain to Nature, knowledge of what will follow from those things becomes clear, so that one can operate from knowledge of the cause, starting with Nature and Nature's attributes, to knowledge of the effect. In this way one's knowledge as a finite mode can resemble the intellect of Nature, or the causal structure of Nature's intellect (Garrett, 2010, Pg. 113-114).

Most people operate by the first type of knowledge, or have a tendency to fall into the types of behavior associated with the first type of knowledge. According to Spinoza, the first kind of knowledge leads to a slew of problems based upon on inadequate ideas, such as superstition, false religious understandings, sadness and passivity. This type of knowledge is based solely on what one perceives either through hearing, reading or seeing, but the investigation ends at perception. When one operates this way one merely takes things at face value, assuming largely that 'that is just the way it is' or 'that luck made things occur this way', not realizing that there is a cause for the way things are nor seeing things as necessitated by the cause, as in the case of adequate knowledge. Due to ignorance, or inadequate ideas, the person is necessarily passive to the world. She awaits happenstance and does not pursue a deeper understanding of Nature or herself (her emotions). Things simply are because that is the way they are, or things are true because she, without further investigation, takes things told, taught or read to be true. In this one does not reflect upon things or events with reason; one makes uninformed decisions or judgments, behaves and reacts without thinking, and often defaults to superstitions and assumptions for answers or comfort. An example may be that one is often angry, depressed and irritable and she simply assumes this is her given disposition: "well, this is just the way I am and I can't change". Yet, if one reflected upon this through reason she may be apt to find the cause of her disposition, such as in a physiological disorder (chemical imbalance or thyroid problem) or perhaps understanding certain things to be 'triggers' for their behavior. If the latter, by use of reason through understanding the cause of their anger one can separate the idea of the external cause of their

¹⁵ Providing an adequate picture of Spinoza's account, or hierarchy, of knowledge is a formidable task, one I will not tackle here. It will be my task to explain as much as is needed to satisfy a sketch of an understanding for the purposes of the discussion here. For more on this topic look to: Garrett (2010), Steinberg (2009), Wilson (1996).

¹⁶ Diane Steinberg in "Knowledge in Spinoza's Ethics" points to the fact that there is some scholarly disagreement whether or not intuitive knowledge is based solely on knowledge of 'particulars'. (Steinberg, Pg. 154) Further, Garrett claims that while universals, or common things, are related to reason and particulars to intuitive knowledge that intuitive knowledge is not limited by, or to, knowledge of particulars (Garrett, 2010, Pg. 110). Lastly, Curley in *Behind the Geometrical Method* claims that intuitive knowledge, or knowledge of God, should be broadly understood as scientific knowledge (Curley, Pg. 125). This should show enough how difficult it is to adequately understand Spinoza's concept of intuitive knowledge.

anger to first reduce the passion, then work to avoid or rid oneself of that particular external trigger.¹⁷ However, if a person only operated by this first type of knowledge no such 'work' or 'therapy' would occur to the individual.

Reason, by definition,¹⁸ operates in how one can see things generally as related to one another, as a part of the larger scheme of Nature, and make practical inferential assumptions and actions based upon this relation.¹⁹ However, what defines the person of reason, or rational person, is her actions amidst the struggle against external causation and/or the passions. In contrast to the person who operates by the first type of knowledge, the rational person seeks to understand the causes of the effects that she experiences in the world. In seeking to understand these causes, one gains knowledge, which allows her to make relational inferences about things in Nature, including one's own and other's behavior. It is not simply the relation between things or events in Nature, but the relation of those things that are viewed as good or bad in relation to one promoting her striving and/or freedom (De Dijn, pg.47). One necessarily forms notions of good and bad corresponding to how something will move her toward, or away from, the ideal free person, which one also necessarily forms in their struggle against external causes (4Pref.). The free person is the ideal one wants herself to become, a model of a perfected human nature, guided by an understanding of Nature and oneself within Nature.

It is in the rational person's desire to become the ideal that the use of the fictions of good and bad come into play through the prescriptions of reason. The rational person is at the mercy of external causation and/or the passions, yet she has her own precepts of reason to aid her through reflection, or use of the imagination (5P10S). The prescriptions of reason state that reason demands that one loves herself, seeks out what useful things will promote her obtaining a greater perfection and that one strives to persevere in their being, or seek one's own advantage, as much as one can (in this) (4P18S). With the understanding that good and evil are not intrinsic to objects or events (4Pref.), but rather to how one is affected either with some variation of joy or sadness (passage to a greater or lesser perfection 3P11S), coupled with the awareness that these affects are related to the promotion or hindrance of one's striving, or one's understanding (4P27), can the moral implications be seen. The activity of virtue occurs by use of one's reason in which one acts in such a way that promotes her own, or others', advantage. This is displayed in Spinoza's two central strengths of character: *tenacity* and *nobility* (3P59S). Both of these strengths of character can be said to be the foundation for all actions which occur insofar as one understands. Moreover, *tenacity* and *nobility* can only be linked to one's activity and not to passivity or partially authored actions. Due to *tenacity* and *nobility* only being linked to understanding, or adequate ideas, a person cannot be called virtuous who acts based upon the first type of knowledge. *Tenacity* is the sort of action one does from the dictate of reason when promoting one's own advantage. Spinoza gives the examples of moderation, sobriety, and presence of mind in danger as virtuous actions relating to *tenacity*. *Nobility* comes about as one strives from the dictate of reason to aid others and/or to join with them in friendship, which can be seen in the given examples of courtesy and mercy.

5P10S states that, "So long as we are not torn by affects contrary to our nature, we have the power of ordering and connecting the affections of the body according to the order of the intellect." From this power one has to order and connect the affections of the body; one can also make it so they are not easily affected by negative emotions. It is in this that one can see how the rational person's practice of *tenacity* and/or *nobility* comes into play. The person of reason, in not having a perfect knowledge of her emotions, is to operate using certain rules or maxims relating to her own striving, which will help guide her. Further, one should not only continually practice these in

¹⁷ This being an example of using propositions or components of Spinozistic therapy as explained in 5P20S (5P2, 5P4S, 5P10S).

¹⁸ By Spinoza's earlier definition.

¹⁹ "Spinoza regards reason as a cognitive inferential process by which adequate knowledge is derived from other adequate knowledge." (Garrett, 1996, pg. 295)

specific events in one's life, but also imagine events which may occur so that when they do, or something similar, she will be prepared to deal with them in the best way possible, or in the most virtuous manner. Spinoza gives us the example of the maxim of life that hate is to be conquered by love, or *nobility* (4P46). So, the rational person is to think of the common wrongs that people do and think how one would respond with *nobility* in mind then one is more apt to be virtuous when these occurrences appear. Jarrett provides an example of how the rational person would respond to feelings of anger due to being tailgated on the highway (Jarrett, pg.164-165). It perhaps is natural to be angry and in these situations people often tend to respond negatively in ways that result in "road rage" and/or accidents because they are responding purely based on a passive emotional response. However, one can realize she is driving slowly and the better action is to move to the right lane to allow the tailgater to pass. Also, she can remember the other drivers' determined nature and that this person could not have acted in any other way given his or her own set of causes, what they were going through in the moment, and realize that it is counterproductive to get upset about something so trivial (5P6). The rational person realizes this is a ridiculous thing to be angry about and can move on feeling good that they avoided a potentially hazardous or frustrating situation and is able to go about their day more joyously (5P10S). When a person realizes one's own advantage (conatus), the satisfaction of the mind by acting according to the right way of living (4p52), the good that comes from mutual friendship and a 'common society', and the necessity of Nature in people or events unfolding, then one will be more likely to overcome her negative emotions related to certain 'wrongs'. There are of course things which will be difficult to overcome, but Spinoza claims that in one's understanding of things this way, by the right ways of living and understanding of necessity, that one will overcome these more quickly than if she didn't use reason to understand things in this way. Moreover, if one only relied on one's emotions, as does the person who operates by the first kind of knowledge, then perhaps she could never get out of sadness, or variations of it.

So, whereas the person who only operates by the first type of knowledge simply takes events to be as they are, or accepts effects without a desire to understand the causes, the rational person using adequate knowledge and reflection will strive to understand why they feel, or are behaving, a certain way. However, unlike the rational person, who has to work to understand their emotions and rely on personal rules to ensure they act with *tenacity* and/or *nobility*, the intuitive person has already established these things so firmly as to not need them. They simply act in the best way possible, in a way that makes the decision seem instantaneous. The few propositions relating to the free person in Part Four of the *Ethics* mean to illustrate the actions that would fall out from the free person's use of ingrained rationality, or established prescriptions of reason, and are not inclusive to all virtues that would or could fall out from them. The examples given are: the free person does not fear death, is valued in avoiding danger as in overcoming it, avoids the favors of the ignorant, has earnest gratitude toward one another, and is always honest (4P67, P69, P70, P71, P72). It is important to regard these in certain degrees rather than absolutes or drawing conclusions that do not align with the point of the actions.²⁰ For example, the free person has no fear of death because to fear is to engage in a type of sadness, a passion. The free person only seeks to promote their advantage and does so naturally. So, it is not that she would welcome death, or would not be upset if it came sooner than later, but that the free person would not waste time worrying about something which is at the same time certain to happen, yet uncertain when and how it will occur. That action of worrying, or dwelling in fear, would only hinder her striving and simply would not occur in her. One can see this also with the example of always being honest. It can be argued that there are times when a person may need to be dishonest to save one's self,

²⁰ The 'point' being what these propositions seek to illustrate much like a fable. In that they are to illustrate the ideal perfected human that the rational person desires to become.

to preserve in one's being, and in doing so is choosing a lesser evil over a greater one, by the dictate of reason, for a greater future good (4P65, P66).²¹

What is perhaps most important to recognize about the free person, who operates via intuitive knowledge, is that they are free from the struggle of the emotions. It is not that they do not have emotions, but that they are not controlled by them.²² In this they live a continually active self-determined life, fully knowing themselves, and taking every event or emotion to be another opportunity to increase their activity of purely living in the moment. It is in this that some have aligned the intuitive person with a sort of high level Buddhist meditative living.²³ Further, it is in this state of pure activity that one can feel the greatest joy derived not only from one's self-determination, as in the person of reason, but based on the intellectual love of Nature that can only be truly felt through intuitive knowledge.

Commonly, when a person is called virtuous, it is said because that person has expressed some action which aligns with what others would consider a good or right action which could be courage, temperance, chasteness, frugality or justice to name a few. For these virtues to be exercised there need not be a certain kind of knowledge which one employs to act with virtue, it is simply the exercise itself which constitutes virtue. However, say by a classical Aristotelian account, a single act of 'virtue', say courage, which is not supported by years of habituation to right action and phronesis in the author, cannot be rightly called a virtuous action. The act of courage may perhaps be called a good action and the first step toward *developing* a virtuous disposition, yet it is not virtue itself. By an Aristotelian account it is after one has gained a character disposition ingrained by years of habituation coupled by achieving phronesis that one can be said to have a virtuous character, or to act virtuously. For Spinoza building a certain character is also of great importance; however one need not have that character cemented before one can be called virtuous. For example, the person of reason can be said to be virtuous, or to act virtuously, without having the constant virtuous disposition that the model of the free person has. One's being virtuous is synonymous with the use of one's power of self-determination. Thus, the more self-determined one is, the more virtuous they can be said to be, and this self-determination rests on an understanding of Nature, as has been explained. Certainly, there are more aspects of Aristotelian virtue one could compare and contrast with Spinozistic virtue, but that would go outside the scope of this work. What is important here is that virtue for Spinoza is something that anyone with reason and the proper understanding of Nature can express. The person of opinion or imagination, who does not understand Nature nor her own (determined) nature as a part of Nature's causal structure, cannot be said to be virtuous in any degree because she lacks the understanding, or use of understanding, necessary to be said to act, or self-determine. Spinoza's virtue is about self-determined action, over passivity to the world, in an effort to maintain a constant joyous disposition based upon knowledge and understanding, and to promote a harmonious rational society.

More on Knowledge and the Significance of Virtuous Character

21 This topic of honesty and the free person is more completely dealt with by Don Garrett in "A Free Man Always Acts Honestly, not Deceptively": Freedom and the Good in Spinoza's *Ethics*".

22 To note: 3D3, "...by affect I understand affections of the body by which the body's power of acting is increased or diminished, aided or restrained...Therefore, if we can be the adequate cause of any of these affections, I understand by the affect and action; otherwise, a passion." The free person, in having adequate knowledge of themselves and the world, is able to be the adequate cause of 'active' affects, which further promotes her activity. As opposed to one whose knowledge is inadequate and who is passive to her affects.

23 De Dijn in his work claims this, and his basis comes from Jay Wetlesen, "...'lose' ourselves in a meditative activity in which our passions are not so much exterminated as functioning as occasions for further meditative thinking, with the active emotions it involves." (De Dijn, p. 50).

From what has been said in the *Ethics*, up to Part Four, 'knowledge of Nature' pertains to reason and intuitive knowledge (from 2P46 and 2P47S),²⁴ however what Spinoza is primarily concerned with until Part Five of the *Ethics* is the second type of knowledge: reason. He is concerned with reason, and in 4P28²⁵ calls reason the mind's greatest good because, by 2P47S, without having a substantial amount of ingrained adequate knowledge from reason, a person cannot move toward deducing specific things. It is in the ability to deduce specific things from an existing significant body of universal knowledge that one comes to have intuitive knowledge. When Spinoza states that "the greatest good of those who seek virtue is common to all, and can be enjoyed by all equally" (4P36), he does not mean to entail that intuitive knowledge, or becoming the free person, is something that can be common to all, but that reason, and acting by the guidance of one's reason can be enjoyed by all equally. From this, it should be clear that becoming the free person is not something that Spinoza held could be achieved by anyone who set themselves to it, which at first glance seems to be what he is claiming, but it *is* instead a difficult and rare thing to achieve, and that the rare few who set themselves toward it will attain (5P42S).

In 5P25, Spinoza claims, "the greatest striving of the mind and its greatest virtue is understanding things by the third kind of knowledge", which seems to contradict 4P28 in that the greatest virtue of one's mind was to know Nature in respect to having adequate knowledge based on reason, which would hopefully, if utilized properly, form into the third type of knowledge. So, where reason had once been one's greatest good, now it has shifted to intuitive knowledge. This seems to be due to the desire to move people toward building an intellectual stronghold based upon reason before moving on to forming intuitive knowledge. The switch of the mind's greatest good in respect to knowledge of Nature, from reason to intuitive knowledge, occurs because it is only by intuitive knowledge that humans as finite modes can use their intellect in a manner which resembles Nature's intellect (Garrett, 2010, pg. 113-114). So, the more that a person who has established a significant body of adequate universal knowledge deduces singular things from that body of knowledge, the more it is that she will understand Nature (5P24). In this a person can be said to know Nature more, or to be closer to Nature, and in this feel the greatest satisfaction at her ability to 'pass to a greater perfection', to become the free person, and feel the deepest joy in this (by 5P27). In addition to becoming the free person and feeling the deepest joy, the free person understands even more deeply than the person of reason of Nature as the cause, and feels a deep intellectual love of Nature (by 5P32C). It is this intellectual love of Nature, accompanied by the joy one feels as the free person, that is eternal blessedness and the great 'reward' of the *Ethics* (5P36S).²⁶

However, as hinted earlier, the difference between the person of reason and the free person is that the joy the free person feels (intellectual love of Nature) is greater and constant, or non-transitory. Whereas the person of reason experiences a joy that is more or less fleeting, dependent upon how close one is to the ideal in the free person. This separation is what concerns some, such as De Dijn, who is concerned that without fully achieving the ideal one is stuck with the 'sorrows of reason', where one knows the better, but cannot avoid the worse (De Dijn, pg.48). He suggests that one cannot have any true success over the emotions by reason alone, nor fully achieve leading the

²⁴ All ideas exist in Nature, as do all things, however to say one had knowledge of something in Nature, would mean they understand it clearly and distinctly, or adequately. Thus, knowledge of Nature is exclusive to reason and intuitive knowledge.

²⁵ 4P28, "Knowledge of God is the mind's greatest good; its greatest virtue is to know God."

²⁶ While eternal blessedness is the highest goal one could achieve through a virtuous character, the doctrine of the eternity of the mind, as a constitutive part of eternal blessedness, is not necessary for one to know to strive for virtue for Spinoza (5P41). He claims it unnecessary in reaction to those who claim that without some divine reward or punishment after one's death that people will not be able, or apt, to live their lives virtuously. Yet, Spinoza says that people do not need religion, or some kind of eternity, to be virtuous persons in their daily lives — people instead need reason based on adequate knowledge (5P41S).

good life, unless one achieves becoming the free person.²⁷ The concern that the person of reason is stuck with the 'sorrows of reason', or that she will never feel joy as deeply as the free person, is easily dismissed when it is realized that a perfected human state is largely unobtainable.²⁸ As mentioned, humans, as a part of Nature, will always be subject to Nature and the passions.²⁹ Even De Dijn admits that the best one can hope for is that she minimizes the control of emotions so that the emotions occupy the smallest part of one's mind. (De Dijn, pg. 53). Events will occur of which one can have no foresight or control, which will lead any person, "free" or otherwise, into passivity, events in which one does not know the cause of the event or thing, and derives passive emotions due to lack of understanding. What I claim is the best one can hope for in this quest for self-betterment, or virtue, is to experience glimpses of the intuitive/free self, and the joys from reason, more often than not so one is motivated to continue to move toward the ideal one desires to be, as seen in the free person. Without the doctrine of eternal blessedness, or eternality of the mind, and due to human bondage, it should be clear now why habituation to *tenacity* and *nobility* is most important. These states will be what enable one to be apt to control their emotions and move one to flourish, not only individually but also communally, in their everyday lives.

Conclusion

Through an understanding of Spinoza's concepts of virtue, the prescriptions of reason, the virtuous states of *tenacity* and *nobility*, and the free person, I hope to have made clear the complexity of Spinoza's concept of virtue, or one's virtuous activity. Further, I hope I have highlighted the problem of our determinism, or human bondage, as the cause for sadness and strife in individuals and communities alike. Specifically, the cause is due to people tending not to think about the causes of their feelings and actions, but instead to think they can control everything (even if they may not explicitly think and/or say this) despite being controlled, or acted upon, themselves. This leads to unfounded expectations and disagreements because people tend to think others are like them, but are not, as each individual comes from their own series of causes. It is in one's realization of their own, and all things', determined nature as being a part of Nature, that one can start to reason and understand in certain ways that decreases one's sadness, frustration, anger and the like toward those things outside of oneself. Additionally, one can lessen those passive emotions and/or passive behaviors by increasing their knowledge of Nature and knowledge of oneself as a part of Nature, through knowing one's own psychology, more what causes her to act in certain ways, what brings about certain emotions, and how to use that knowledge to one's advantage. It is in this that one can move toward virtue, seeking what is best by their nature (conatus) and avoiding what will hinder or harm it. What I have also shown is that it is in the activity of pursuing one's own advantages that one feels good, or happy, and does so the more one understands Nature, because she can make more informed rational choices. Further, the more one

²⁷ True virtue, or leading the perfected human 'good life', can only exist in the free person because the person of reason still has a certain lack of power (4P37S1). They may act virtuously, and do so the more they habituate themselves to the guidance of reason through acting with *tenacity* and *nobility*; however their use of virtue will always be less perfect than the virtue that exists in the free person, simply by the means of which they must employ it. Therefore, the greatest virtue is to be found in the free person whose virtuous activity is constant, and a lesser virtue to be found in the person of reason whose virtuous activity waxes and wanes.

²⁸ In addition to the point that becoming the free person is largely unachievable, in "Spinoza's Ethical Theory", Garrett, states the free person is a model to set oneself to in one's process of enhancing their existence, or working to lead an ethical life, and that within the *Ethics* the perfectly free person would turn out inconsistent with Spinoza's initial propositions (Garrett, 1996, pg. 289).

²⁹ 3P59S- "From what has been said it is clear that we are driven about in many ways by external causes, and that, like waves on the sea, driven by contrary winds, we toss about, not knowing our outcome and fate."

4P4C- By 4P3 and 4P4, "From this it follows that man is necessarily always subject to passions, that he follows and obeys the common order of Nature, and accommodates himself to it as much as the nature of things requires."

5Pref.- "Here, then, as I have said, I shall treat only of the power of the mind, or of reason, and shall show, above all, how great its dominion over the affects is, and what kind of dominion it has for restraining and moderating them. For we have already demonstrated above that it does not have an absolute dominion over them."

acts based on knowledge and feels joy from the action, the more one wants this virtue not only for oneself, but for others as well. However, to be honest, the reason one wants this for others is so they can get along with other people more easily (agree in natures) to benefit one's own striving. Still, this does still benefit the whole even if at its core it can be claimed solely egoistic.

By way of understanding the benefits that come from virtue, and its components, I have shown they can be easily 'taken away' by external causation, or our human bondage to the passions. When a person is feeling happiness in their striving along comes an event, person, or passion that takes them off guard and sends them into some variation of sadness. Due to this one must habituate oneself to a certain way of thinking to deal with these events in a way that best promotes one's striving. This way of thinking includes the aforementioned knowledge of Nature and causal determinism, but it is more in understanding one's emotions and reactions to events or things in the world. After having understanding of one's emotions and reactions one's virtue is seen in thinking about what would be the best action to aid oneself (*tenacity*) or another (*nobility*) in their striving, or what could benefit both. Further, the value in this type of habituation (practice) is supported by its use and study in psychotherapy.

Due to the difficulty in achieving a perfected intuitive knowledge and by being bound to the order of Nature (4P4C), the ideal set to achieve in the free person who experiences eternal blessedness is largely unachievable for most all people. Yet, Spinoza's philosophy, or specifically virtue, is meant to be one common and achievable by all (4P36). If one is to seek virtue, or a virtuous manner of living from Spinoza's work, that can be common to all, I claim we must defer to reason. I have shown not only eternal blessedness regarding the eternity of the mind, which Spinoza claims is unnecessary (5P41), but in the blessedness that follows from intuitive knowledge and the intellectual love of Nature (5P36S), as unnecessary as well, as one can experience, to a lesser degree, this same joy through reason. Through this it has been my task to show that the more practical goal in obtaining virtue, or in realizing the ethics of the *Ethics*, comes from the joy one feels in realizing her virtue, a type of blessedness, through reason, and by aiding others to realize this joy as well in one's daily life.

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Effects of Environmental Enrichment and Natural Substrates on Increasing Species-Specific Behavior of Captive Northern White-Cheeked Gibbons (*Nomascus leucogenys leucogenys*)

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Abstract:

Suboptimal housing conditions in zoos can cause animals to develop negative behaviors associated with excessive stress levels. Environmental enrichment and the use of natural substrates can decrease stereotypy and increase species-specific behaviors of captive animals (Gibbons et al, 1994). This study observed two pairs of gibbons (*Nomascus leucogenys leucogenys*) at the Oregon Zoo for 40 hours from July 5th through August 7th in order to analyze the effect that increased environmental enrichment and natural substrates had on the behavior of captive white-cheeked gibbons. One of the gibbon pairs (Phyllis and Duffy) had been housed in the new Red Ape Reserve for 10 months prior to this study. The experimental pair of gibbons (Nancy and Gunther) had access to the outdoor portion of the exhibit for two hours every morning beginning ten days prior to the start observations. The behaviors of the two pairs of gibbons were compared with the intention of determining the extent to which access to a larger, more natural environment with improved enrichment strategies promoted the species-specific behaviors of arboreality and brachiation. Activity levels were also analyzed to determine the extent to which the enrichment techniques have affected the cognitive health of the subjects. After all observation hours were completed, it was determined that within the experimental group, instances of brachiation, arboreality and activity levels increased significantly and the amount of time the subjects spent on or close to the ground decreased throughout the course of this study. It was concluded that access to natural substrates and increased environmental enrichment did increase species-specific behaviors of the captive white-cheeked gibbons at the Oregon Zoo.

Introduction:

Environmental enrichment can be defined as modifications to an animal's environment that increase their biological functioning (Newberry, 1995). Zoos in the United States have been implementing environmental enrichment for several decades in an attempt to mitigate the amount of stress captive animals experience (Swaisgood and Shepherdson, 2005). Stereotypic behaviors, defined as repetitive movements that do not serve an immediate function, are common in captive animals due to a lack of physical and psychological stimulation (Mason, 1991). A reduction of species-specific behaviors is also very common among animals housed in suboptimal conditions due to the inability of the animal to interact with its environment in a natural way (Gibbons et al, 1994). Environmental enrichment research aims to increase the amount of stimulation in the captive animals' enclosure. This is accomplished through a myriad of different methods such as recreating natural environments, placing food into puzzle boxes, and hiding scents and treats throughout an enclosure. Enrichment programs have been associated with a 53% decrease in stereotypy (Swaisgood and Shepherdson, 2005). With increased research on the success rates of each type of enrichment strategy for specific animals, the living conditions of captive animals will greatly improve.

The Hylobatid apes, also called lesser apes because of their small stature in comparison to the great apes, are highly arboreal primates endemic to the tropical and subtropical forests of South, East, and South-East Asia (Geissman, 1995). There are four genera of gibbon in the family Hylobatidae that are distinguished from each other by the number of diploid-chromosomes they each have; *Hylobates* (dwarf gibbons) 44 chromosomes, *Hoolock* (hoolock gibbons) 38

chromosomes, *Symphalangus* (Siamangs) 50 chromosomes, and *Nomascus* (crested gibbons) 52 chromosomes (Tuttle, 1986). Northern white-cheeked gibbons, *Nomascus leucogenys leucogenys*, are endemic to southern Yunnan, North-Western Vietnam and Laos (Geissman, 1995). The populations of northern white-cheeked gibbons in the Yunnan province are thought to be extinct as China has not reported any sightings of this species to the International Union for the Conservation of Nature (IUCN) since 1990 (University of Wisconsin, 2010). Currently the population in Vietnam is critically endangered and the population in Laos is quickly diminishing due primarily to habitat loss (Gibbon Conservation Center, 2010).

Subjects: The Oregon Zoo currently has four individuals of the species *N. leucogenys leucogenys* that are housed in separate adjacent enclosures in mated pairs. Phyllis (female) was the first gibbon that was obtained by the Oregon Zoo in September of 1975. Her estimated birth date is in 1970; however the exact date is unknown because she was not born in captivity. Gunther (male), the oldest of the four, was born in the wild in approximately 1964 and acquired by the Oregon Zoo in October of 1975 (Oregon Zoo, 2011). These two gibbons formed a very successful mated pair and produced many offspring over the next twenty years (Thomas, 2011). In 1995, the Oregon Zoo acquired another white-cheeked gibbon, Nancy, a wild born female gibbon approximately the same age as Phyllis (Oregon Zoo, 2011). After her arrival, Nancy was paired with Gunther (Thomas, 2011). In 2000, the zoo obtained their last gibbon, Duffy, a five year old captive born male, by far the youngest of the group (Oregon Zoo, 2011). With this new addition, the keepers decided to pair Phyllis and Gunther back together and pair Duffy with Nancy. This situation worked until Duffy reached puberty, at which time he became overly aggressive towards Nancy. It was decided to pair Duffy with Phyllis, a more dominant female. Nancy and Gunther were paired together because they were both more submissive. There have been no problems between the animals since they have been paired in this way.

Prior to the opening of The Red Ape Reserve in September of 2010, the last significant renovation of the primate exhibit at the Oregon Zoo occurred in 1981 (Oregon Zoo, 2011). The older enclosures consisted of concrete walls and floors, logs and metal bars for climbing, sparse access to natural substrates such as dirt and grass, or toys (balls, magazines, old t-shirts, dog toys, etc). While being housed in these exhibits, the white-cheeked gibbons had shown a marked decrease in species-specific behaviors such as brachiation and arboreality. In order to decrease abnormal behaviors in both the gibbons and orangutans, The Red Ape Reserve was constructed. It includes two 410 ft² indoor enclosures, one built to suit the pair of orangutans (Kutai and Inje) and one to suit a pair of gibbons, with a 5,400 ft² outdoor enclosure to which both the orangutans and gibbons have access during zoo operating hours. Due to the highly territorial nature of gibbons, and lack of funding for an additional indoor gibbon habitat, only one pair of the pairs of gibbons (Phyllis and Duffy) were able to move into the new Red Ape Reserve's indoor gibbon enclosure (Thomas, 2011).

The outdoor habitat is exposed to the weather and equipped with natural foliage, vines, soil, water. No species of primate in this exhibit has had the opportunity to experience any of these features in its previous habitat. The zoo also created a hollow "enrichment tree" in the shape of a large buttress tree that keepers can enter through an underground tunnel. The tree has various holes and in which keepers hide toys, treats and puzzle boxes in order to give the animals opportunities to search for food and enrichment stimulation. The indoor portion of the habitat has a variety of trees and vines on which the primates can play and was also designed to utilize 100% of the vertical space to increase the area that is accessible to the primates. This was done to increase the amount of time that the apes spent above ground, a natural behavior of both gibbons and orangutans. The side of the indoor habitat that is adjacent to the outdoor enclosure is lined completely with glass so the animals have a visual connection to the outdoors at all times. The glass wall coupled with skylights provides plenty of natural light for the primates even when

indoors (Oregon Zoo, 2011). All of this was accomplished with the hope of increasing psychological and physical stimulation within the primates' environment and thereby encouraging species-specific behaviors of the primates (Lewis, 2011). Gibbons are naturally a highly arboreal species that spend the vast majority of their time above ground. Nancy and Gunther's indoor enclosure has not been remodeled.

As of June 25th, 2011, Nancy and Gunther have been given access to the outdoor portion of The Red Ape Reserve from 9:00 am to approximately 10:45 am daily. While Nancy and Gunther are in this area of the exhibit, Phyllis, Duffy and the orangutans are restricted to their indoor enclosures. Nancy and Gunther do not share the outdoor enclosure with the other gibbons or the orangutans at any time. After 10:45 am, Nancy and Gunther are taken back to their indoor enclosure for the remainder of the day. Phyllis, Duffy and the two orangutans (Inje and Kutai) have access to the outdoor portion of the Red Ape Reserve immediately after Nancy and Gunther have been taken back inside. At the time of this study, the keepers have no intention of allowing Nancy and Gunther to share the outdoor portion of the exhibit with the orangutans (Thomas, 2011). Phyllis, Duffy and the orangutans have access to the outdoor exhibit from approximately 10:45 am to 6:00 pm, when the zoo closes to the public.

It is hypothesized that Phyllis and Duffy's behavior will stay fairly consistent throughout the course of this study because they have been housed in The Red Ape Reserve for a longer time frame and therefore have had time for their behaviors to adjust to their newer environment. However, there may be an increase in the territorial behavior of this pair because this is the first time that these animals have had to share a portion of their enclosure. Nancy and Gunther's behavior, however, is expected to change significantly throughout the course of this study. It is presumed that their activity levels, arboreality and instances of brachiation will increase due to increased environmental enrichment and access to natural substrates and that the amount of time that these animals spend on or near the ground will decrease by the end of the study.

Methods:

Scan sampling occurred at 60 second intervals over the course of 33 observation periods. A total of 20 hours was spent observing each pair of gibbons. Observation hours varied from 9:00 AM to 6:00 PM in order to capture all hours the gibbons were on exhibit at the Oregon Zoo. Behaviors of the gibbons were observed on all days of the week. A stop watch set to 60 seconds was used to determine when to record the behavioral data. The behavior of the gibbons was recorded on the ethogram that had been created for this study (Appendix 1). This ethogram was based on a pilot study of the four gibbons' behavior prior to the construction of the Red Ape Reserve and was expanded to reflect the aims of this study (Davis, 2011).

During each scan the following data points were recorded for each individual gibbon: their location (indoor or outdoor and where exactly in those exhibits the subjects were), elevation from the ground, proximity to their partner, proximity to each orangutan, their posture or mode of locomotion, and the activity they were engaged in at the time of the scan. The codes for these parameters are defined in Appendix II. The possible locations for the animals were broken down into five sections due to the large area of the exhibits: the orangutans' indoor enclosure (Indoor I), Phyllis and Duffy's indoor enclosure (Indoor II), Nancy and Gunther's indoor enclosure (Indoor III), the area of the outdoor enclosure to the east of the tree tunnel entrance where the gibbons have their access chutes (Zone 1), and the area of the outdoor enclosure to the west of the tree tunnel where the orangutans have their access door (Zone 2) (Fig. 1). Every instance of an interspecies social interaction was also recorded and described in order to quantify the interspecies relationships between Phyllis and Duffy and the orangutans. If a subject was engaging in multiple activities at once (such as eating and receiving allogrooming) activities that were of a more social

and dynamic nature (allogrooming, social interactions, play) were given preference over behaviors that could be considered solitary activities (feeding, foraging, or looking around enclosure).

A)



B)



Figure 1. A) Picture of Nancy in the portion of the outdoor enclosure of The Red Ape Reserve labeled Zone 1. B) Picture of Kutai in the portion of the outdoor enclosure of The Red Ape Reserve labeled

Results:

Location: While in sight, Phyllis and Duffy spent the majority of their time (52% and 66% respectively) in the outdoor portion of the Red Ape Reserve labeled Zone 1. Phyllis was the only gibbon to enter the Orangutans' indoor enclosure, despite constant access. This event happened only once while both orangutans were outdoors and lasted a total of two minutes. Nancy and Gunther spent nearly an even amount of time within the outdoor and indoor enclosures. Gunther was the only gibbon to spend slightly more of the time he was in view within his indoor enclosure (53%). Nancy spent slightly more time outdoors (52% of her in sight time). Nancy only spent a total of two minutes in the portion of the outdoor enclosure labeled Zone 2 (less than any other gibbon).

Elevation: Elevation of the gibbons did not differ greatly within the two pairs; however it did differ greatly between the pair that had been given greater access to the remodeled environment and the pair that had recently been introduced to the outdoor portion of the Red Ape Reserve (Table 1). Phyllis and Duffy spent the least amount of their time below two meters from the ground; both gibbons only spent 11 minutes on the ground throughout all hours of observations, approximately 2% of the total time they spent in sight of the researcher. The amount of time spent above four meters from the ground was used as a positive indicator of the arboreality of the animals during this study. Duffy spent on average 73.09% of his time above four meters from the ground, the most of any of the gibbons. Phyllis spent a similar 71% of her time above four meters. Nancy and Gunther, however, spent much more of their time (over 55%) on the ground instead of at a significant elevation. Nancy spent the shortest amount of time above four meters from the ground at only 135 minutes or 14.35% of her in sight time. The average amount of time Gunther spent above four meters was only slightly more at 155 minutes (16.68%).

Table 1. Time (in minutes) each gibbon spent at certain elevations

	Phyllis	Duffy	Nancy	Gunther
Ground	11 min	11min	469 min	454 min
0- 2 meters	3 min	28 min	105 min	69 min
2-4 meters	142 min	123 min	118 min	137 min
Over 4 meters	385 min	440 min	135 min	155 min
Total in sight	541 min	602 min	941 min	929 min

During weeks four to six, Nancy and Gunther did decrease the amount of time they spent on the ground by 24.65% and 12.34% respectively (Fig. 2A). Throughout these weeks, the disparity between the two groups decreased significantly, however Phyllis and Duffy still spent between 0.81% and 6.17% more time above four meters from the ground (Fig. 2B).

A)

B)

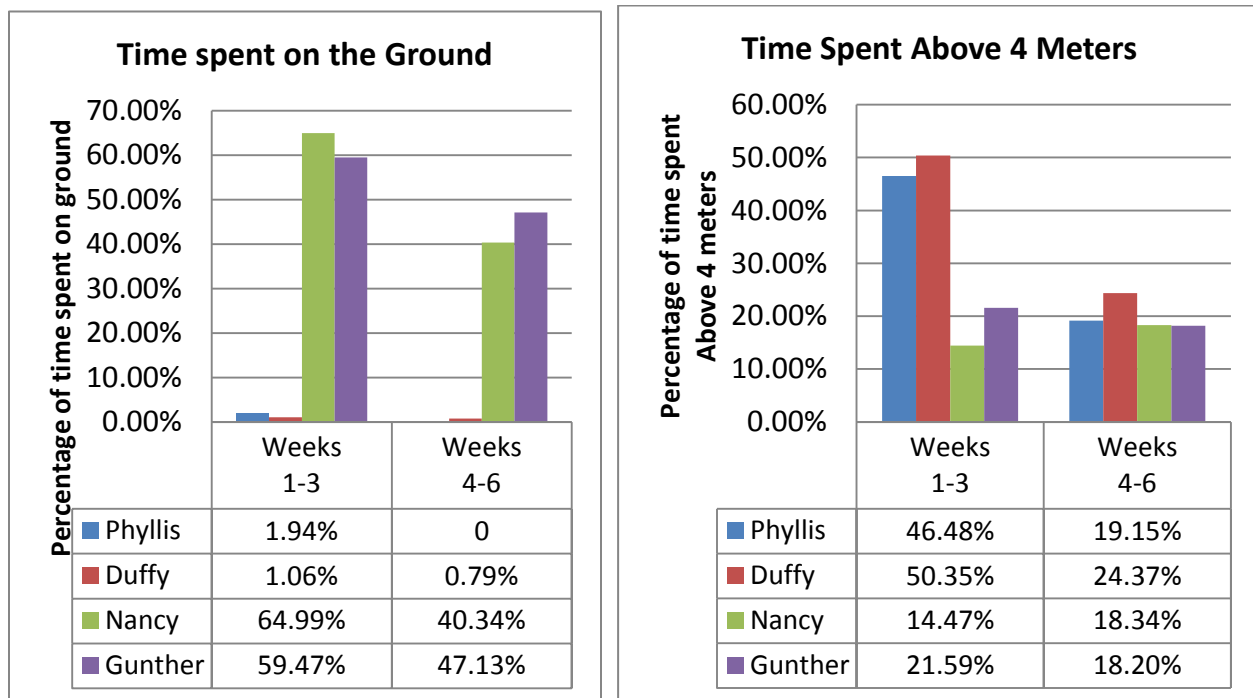


Figure 2. A) Comparison of the percentage of total time each gibbon spent on the ground during weeks one-three and weeks four-six. B) Comparison of the percentage of time each gibbon spent above four meters from the ground during weeks one-three and weeks four-six.

Brachiation: Duffy showed the most instances of brachiation, he spent 137 minutes of total observation hours brachiating. Nancy and Gunther used brachiation less frequently, only 39 and 42 minutes, respectively, throughout all hours of observation. To account for the difference in activity levels of the four gibbons as a reason for the large disparity in these numbers, the amount of time spent brachiating was divided by the amount of time each animal spent active throughout the study. These percentages can be seen in Table 2. Phyllis and Duffy spent significantly more of their active time brachiating than did Nancy and Gunther (Fig. 4).

Table 2. Percentage of active time each animal spent brachiating

	Phyllis	Duffy	Nancy	Gunther
Percent	77%	88%	16%	23%

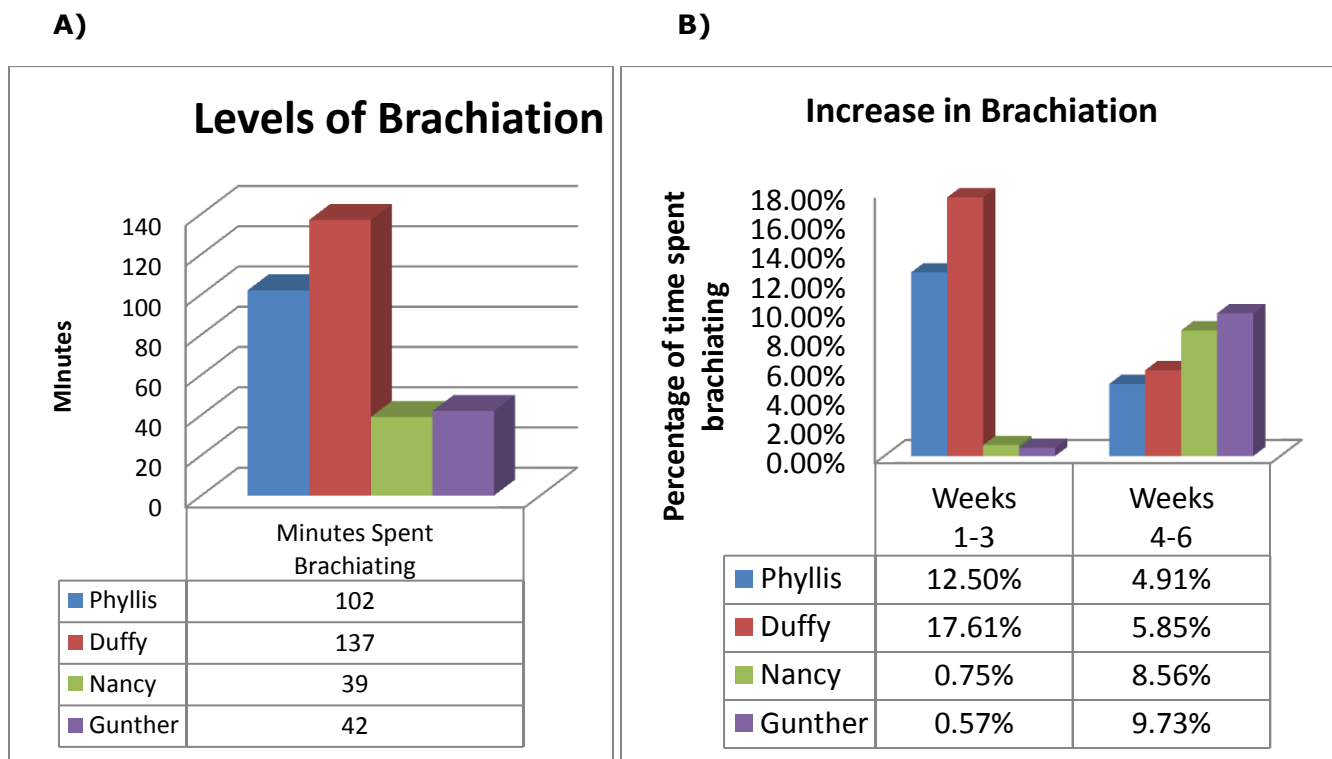
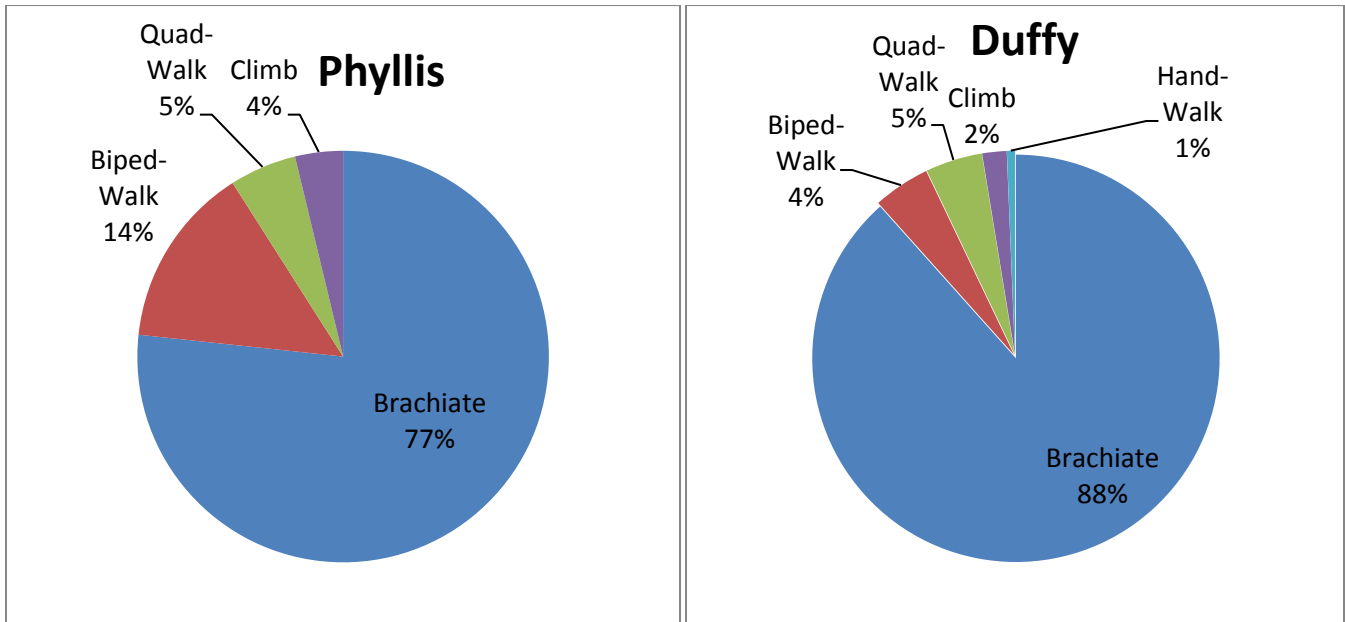


Figure 4. A) Total minutes each gibbon spent brachiating during all observation hours (1200 minutes/each gibbon) B) Comparison of the percentage of time each gibbon spent brachiating during weeks one-three and weeks four-six.

During the first three weeks of the study, Nancy and Gunther spent less than 1% of their time brachiating, compared to the 12.5% and 17.51% of time Phyllis and Duffy spent brachiating over the same period (Fig. 5). During the last three weeks of this study however, both Nancy and Gunther increased brachiation by over ten fold. This is a considerable increase, especially when the control group (Phyllis and Duffy) decreased their instances of brachiation by 7.59% and 11.76%.

Mode of Locomotion: Both Phyllis and Duffy's primary form of locomotion was brachiation, which made up 77% and 88% of their movements, respectively (Fig. 6A). Nancy and Gunther had a more even distribution of locomotive movements, and much fewer instances of brachiation (Fig. 6B). Instead, bipedal walking tended to be the primary form of locomotion for Nancy and Gunther, followed by climbing.

A)



B)

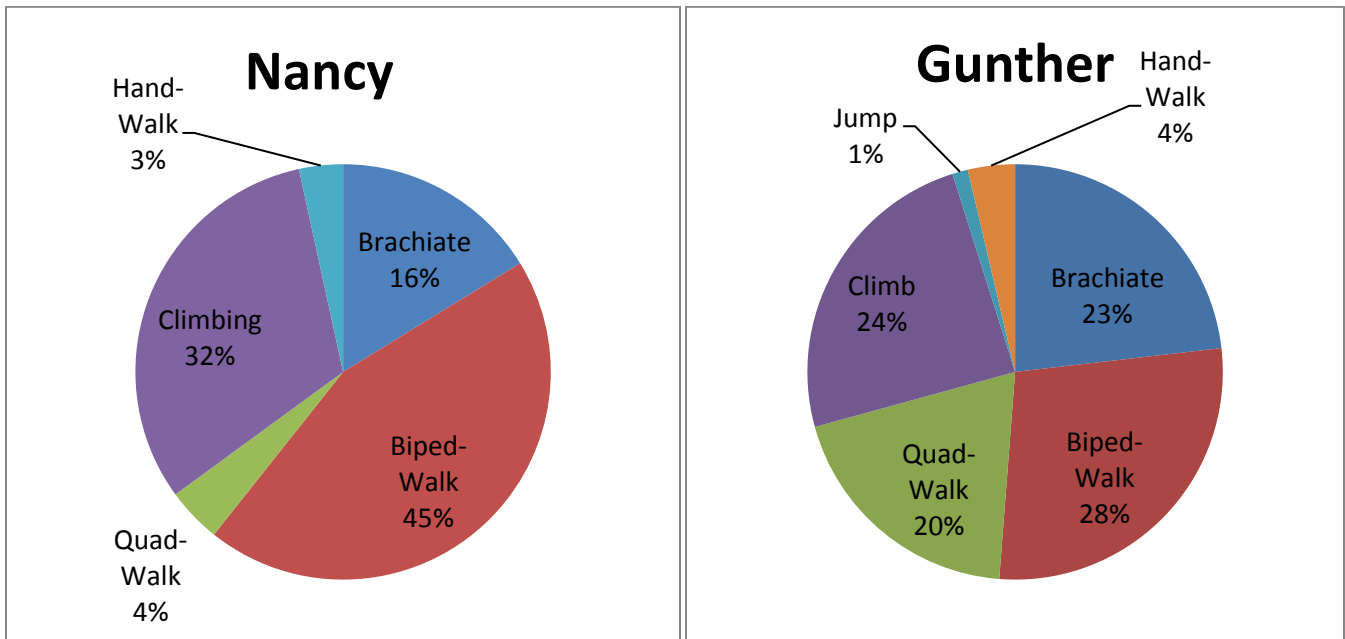


Figure 6. A) Modes of locomotion used by Phyllis and Duffy throughout total in-sight observation time. B) Modes of locomotion used by Nancy and Gunther throughout total in-sight observation time.

Activity Levels: Active was defined as engaging in any kind of locomotive behavior (brachiation, bi-pedal walking, quadrupedal walking, hand-walking, climbing, and jumping). Non-active was defined as any non-locomotive postures (hanging, sitting and lying). There were very similar results within the pairs of gibbons. Phyllis and Duffy spent approximately 25% of their time active and 75% inactive. Nancy and Gunther spent more time inactive than did the other pair. They spent approximately 15% of their time active and 85% inactive (Table 3).

Table 3: Minutes each gibbon spent active and non active during total observation hours (1200 min/each gibbon).

	Phyllis	Duffy	Nancy	Gunther
Active	133 min	154 min	155 min	140 min
Non- Active	408 min	447 min	786 min	789 min
Total in-sight min	541 min	601 min	941 min	929 min

The behavioral data collected on all four gibbons were separated into week’s one through three and weeks four through six to ascertain any change in behavior following introduction into the new exhibit. Nancy and Gunther’s activity levels increased markedly throughout the course of the study. Gunther increased the time he spent active by nearly eight times (3.79% to 29.9%) and Nancy almost doubled her activity (12.97% to 21.03%). During this time, Phyllis and Duffy decreased the amount of time spent active by 7.7% and 10.59% (Fig. 7).

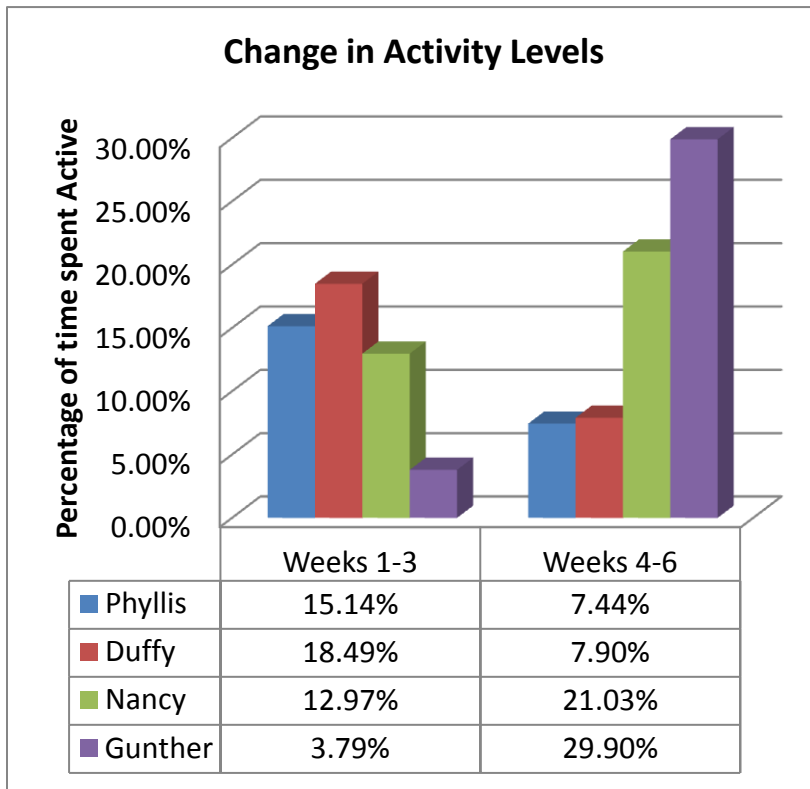


Figure 7. Comparison of the amount of time each gibbon spent active during weeks one-three and weeks four-six of the study.

Interspecies Relationship: There was a lack of evidence to support the existence of an interspecies relationship between Phyllis and Duffy and the two orangutans, Inje and Kutai. The gibbons did not spend a significant amount of time in close proximity to either orangutan and every time that this occurred, the orangutans were the ones that came within two meters of the gibbons, never the other way around. When the orangutans would get close to the gibbons both Phyllis and Duffy would stare at the orangutan for a short while before brachiating away. On one occasion, Kutai came within one meter of Phyllis. Duffy was about 6 meters away when this occurred. Phyllis backed up into the chute that connects their indoor enclosure with the outdoor enclosure while staring at Kutai’s face. Duffy then brachiated towards the two of them. Kutai saw him coming and started

moving back towards Zone 2 of the outdoor enclosure. Duffy followed him a little ways into Zone 2 but then brachiated back towards Phyllis. This was the extent of the observed interspecies interactions between the gibbons and the orangutans.

Comparison of Nancy and Gunther’s behavior indoors and outdoors: To determine whether there was a difference in key behaviors when Nancy and Gunther were located in their indoor enclosure that had not been renovated, compared to when they were given access to the highly enriched outdoor enclosure of the Red Ape Reserve, Nancy and Gunther’s behavioral data from the two enclosures was analyzed separately. Both Nancy and Gunther’s activity levels were higher indoors than outdoors. Gunther’s activity level was nearly four times as high indoors. Time spent on ground level and brachiating followed the same unexpected pattern as Nancy and Gunther’s

indoor and outdoor activity levels; both gibbons showed more positive results indoors rather than outdoors. See Fig. 11 A-D for more detail. The only parameter that had results which followed the hypothesis that the subjects would show increased species-specific behavior outdoors was that Nancy spent more time above four meters from the ground outdoors rather than in her indoor enclosure.

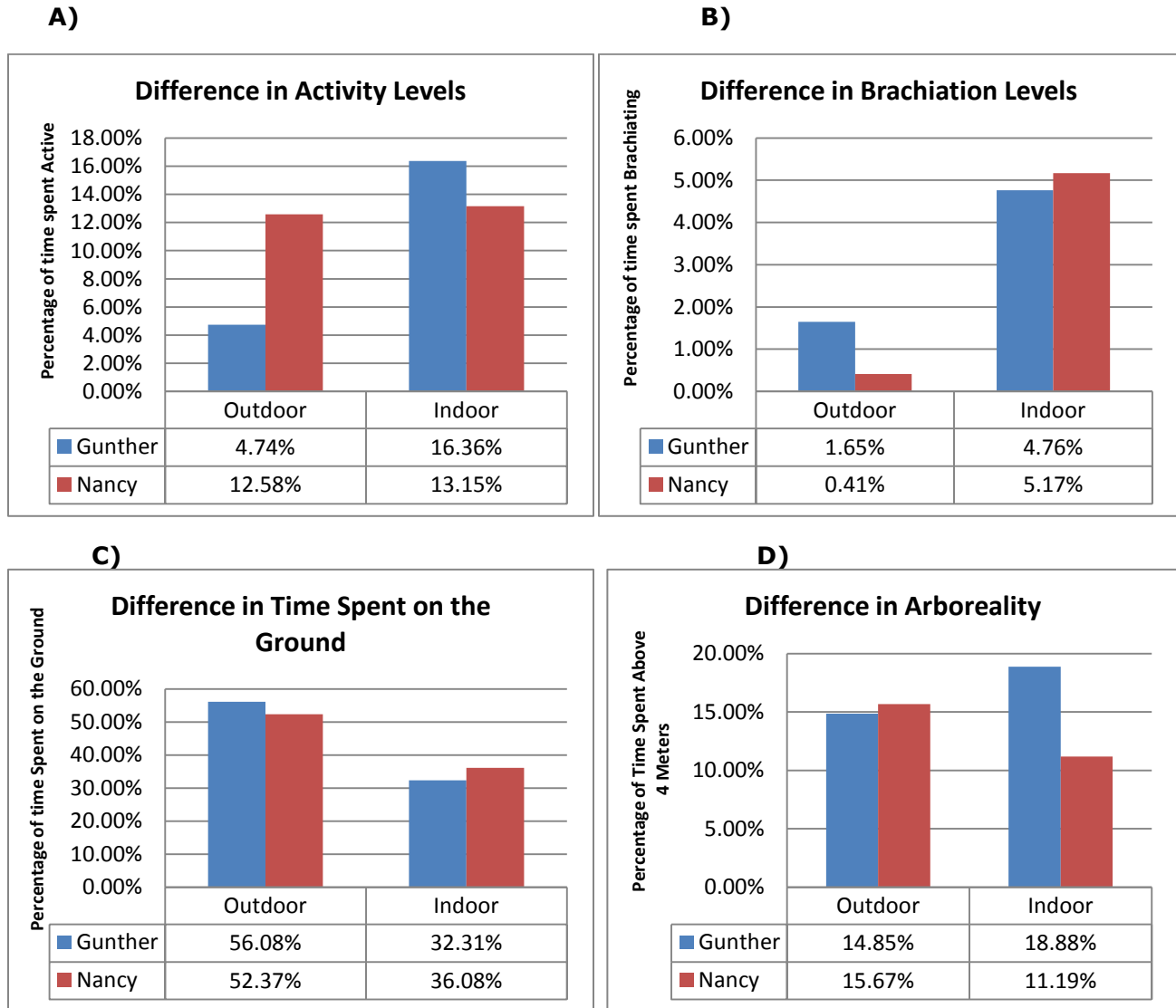


Figure 11. Comparison of Nancy and Gunther's behavior in their un-remodeled indoor enclosure and in the outdoor portion of the red ape reserve. A) Activity levels B) Percentage of time spent brachiating C) Percentage of time spent on the ground D) Percentage of time spent above four meters from the ground

Occurrences of stereotypies: Throughout all observation hours, there was no indication of stereotypies in any of the four gibbons.

Discussion:

There were distinct differences between the pair of gibbons with longer access to the enriched enclosures and the pair of gibbons that had been recently introduced to the outdoor portion of the reserve. This study focused on the species-specific behaviors of brachiation and arboreality (measured by the amount of time spent above four meters from the ground) and also

activity levels, which is usually indicative of cognitively healthier animals in enriched environments (Gibbons et al, 1994). An increase in these behaviors in Nancy or Gunther would indicate that the introduction of natural substrates and increased environmental enrichment were having a positive effect. Because Phyllis and Duffy had been housed in the Red Ape Reserve for roughly one year before the beginning of this study, it was assumed that their behavior would not change dramatically. Their behavior was used as a control when analyzing a change in Nancy and Gunther's behavior throughout the course of this study.

As predicted, Phyllis and Duffy had higher activity levels and spent considerably more time brachiating and at higher elevations than Nancy and Gunther had. The large disparity in these numbers may have been influenced by the personalities of the individual gibbons. Phyllis and Duffy are the dominant animals of the four gibbons, this is one of the reasons the keepers decided to give them access to the new enclosure initially. Duffy is also only 16 years old, making him by far the youngest gibbon at the Oregon zoo which may increase his likelihood to be more active. The marked decrease in brachiation events in the control group during weeks four through six may be explained by the weather. It was perceptibly warmer during the weeks four through six of this study, reaching up to nearly 90 degrees Fahrenheit in the afternoons, about 10 degrees higher than weeks one through three. Nancy and Gunther did increase their activity levels and arboreality and also greatly increased the amount of time spent brachiating during weeks four through six of this study, even in their older enclosure. This suggests that as little as two hours a day in a highly enriched environment filled with natural substrates can perceptibly increase the species-specific behavior of arboreality and brachiation in captive northern white-cheeked gibbons.

Nancy and Gunther increased their activity levels, time spent brachiating and also decreased the amount of time they spent on the ground while in their indoor habitats. This was not necessarily expected because the indoor enclosure had not been renovated. Beginning in August, Nancy and Gunther's schedule for use of the Red Ape Reserve changed from morning access to over-night access. During this time, researchers were not able to observe the animals outdoors due to the zoo's operating hours. Most of the outdoor observations occurred during the first four weeks of the study, when the animals could have still been warming up to the new the exhibit and the positive effects of the enrichment had not taken full effect yet. Access into the Red Ape Reserve could have increased the activity of these animals, however due to the lack of ability to observe these animals outdoors, this was not recorded. Having access to the enriched environment could also have increased species-specific behaviors and positive behaviors in the un-remodeled environment due to an increase in cognitive health overall. The animals may have spent more time foraging and eating indoors due to boredom while in their indoor enclosure. These results may also have been influenced by the change in schedule midway through this study.

In addition to using Phyllis and Duffy's behavior as a control, their behavior during observation periods in which Nancy and Gunther had recently had access to the outdoor portion of the Red Ape Reserve (when the observation period occurred less than one hour since a pair-switching event) was analyzed in order to determine whether or not Nancy and Gunther's presence in the territory influenced Phyllis and Duffy's behavior. A pair-switching event was defined as the several minutes where Nancy and Gunther were brought indoors and Phyllis and Duffy were given access to the outdoor enclosure for the remainder of the day. This has been the first time that these animals have shared any part of their habitat with others of the same species. White-cheeked gibbons, like all gibbon species, are highly territorial, therefore the possibility of the expression of territorial behaviors could not be ignored. Solo and duet vocalizations are the primary method gibbons use to defend their territories (Tuttle, 1986). During the course of this study, vocalizations occurred only once directly following a pair-switching event. On this day, Phyllis engaged in duet vocalizations with her partner Duffy for three minutes. During these duets, Phyllis always initiated the calls

which were followed several seconds later by Duffy joining the duet. Throughout the entire study, Phyllis was not heard solo vocalizing.

On the same morning, Duffy was also heard vocalizing. He engaged in solo and duet vocalizations for a total of three minutes each. Just after each of Duffy's solo vocalizations, Gunther was heard vocalizing in his indoor enclosure. During this time, Duffy and Gunther stared at each other the entire time through the glass and wire enclosure gates. The occurrences of vocalizations do support a territorial dispute, however, these were only heard on one morning throughout the six week study. This does not give adequate support to the hypothesis that Nancy and Gunther's presence in the outdoor portion of the Red Ape Reserve significantly affected vocalization territorial behaviors of Phyllis and Duffy or vice versa; more trials would be needed in order to make that conclusion.

Another territorial behavior that was elicited by both Phyllis and Duffy was staring at the other pair of gibbons (labeled LOOP in the ethogram). Duffy engaged in this behavior more often than Phyllis did, which is consistent with the male of this species possessing a more territorial nature. During observations that began within one hour of a pair-switching event, Phyllis spent 11 minutes or 5.31% of her time exhibiting this behavior and Duffy spent a total of 34 minutes or 14.78%. During observations that began at least one hour after a switching event, Phyllis spent 18 minutes or 5.39% and Duffy spent 17.74% of their time engaging in this behavior (an increase in frequency by 0.08% and 2.96% respectively). Phyllis' change in frequency was not great; however, the frequency of Duffy eliciting this behavior did increase during observations occurring at least an hour after a switching event. These results again do not show conclusive evidence to support a change in behavior due to territorial disputes. Using observations that began over an hour after a pair-switch might not have been an adequate control.

Additional Observations: During one observation period, Duffy was recorded engaging in self-directed behavior (grooming) with the use of a reflective surface to see areas of his body he otherwise would not have been able to view (his backside and buttocks) (Fig. 12). This is a remarkable observation because there are a multitude of studies that indicate that gibbons, or lesser apes, are incapable of recognizing their reflection in the mirror as themselves (Suddendorf & Collier-Baker, 2009; Hyatt, 1998). There have only been two studies that indicate the possibility of self-recognition in two genera of gibbon; *Symphalangus* and *Hylobates* (Ujhelyi et al, 2000; Heschl & Fuchsbichler, 2009). During these studies individual gibbons were seen engaging in self-directed behaviors in front of a mirror; however in both studies all the gibbons failed a Gallup mark test. The standard Gallup mark test involves marking an animal on the cheek or forehead and allowing it access to a mirror. To pass the test, the animal must notice the mark and attempt to remove it, thereby showing clear evidence of self-recognition. Duffy's behavior is a good indication that the individual is self aware; however there is debate to whether using a mirror for self-directed behaviors is enough evidence to imply an animal's ability of self-recognition (Bard et al, 2006). Conducting a version of the mirror mark test would provide an objective measure of visual self-recognition (Suddendorf & Collier-Baker, 2009) and is recommended for future studies on these gibbons.



Figure 12. Duffy engaging in self-directed grooming with the aid of a reflective surface

The phylogeny of the Hylobatid family is still under debate (Geissmann, 2003; Suddendorf & Collier-Baker, 2009). However, several theories have arisen as a result of the use of molecular, morphological, and vocal data comparisons using Bayesian analysis (Geissmann, 2003; Roos & Geissmann, 2001; Wildman et al, 2003). One theory held by Thomas Geissmann and Christian Roos, is that *Nomascus* is the most basal genus of the Hylobatid family (Roos and Geissmann, 2001). Based on this theory, conducting a mirror mark test on a member of the genus *Nomascus* would greatly benefit the body of knowledge on gibbon cognition and the evolution of hominoid visual self-recognition.

Limitations: There were several limitations to this study, some of which have already been mentioned. To cover all of the observation hours needed for this study, observation periods varied throughout each day. This can cause variations within the data sets due to differences in behavior during different periods of the day. The temperature and weather were not consistent throughout the course of the study. Temperatures ranged from approximately 60° to 90° Fahrenheit. The weather included sunny, cloudy, and rainy days during the study. While temperatures were high, the animals spent more time out of sight and inactive. The number of people that attended the zoo also changed daily and throughout each day. The number of people viewing the subjects and the noise level of the viewers seemed to have some effect on the behavior of the animals, especially while the animals were in their indoor enclosures. During periods when there was a high volume of visitors, the animals tended to spend more time out of sight. Duffy's age differed greatly from the rest of the subjects; this may have greatly contributed to his higher brachiation and activity levels. This study also used a small sample size of four subjects, leading to a possibility that these results may not be universally true among captive white-cheeked gibbons. Individual personalities may have a large effect on the behavior of animals and can account for some of the variation of behavior between the subjects. Beginning in August, the primate keepers modified Nancy and Gunther's schedule of use of the Red Ape Reserve. Instead of access to the outdoors for two hours every morning, Nancy and Gunther had access to the entire outdoor enclosure overnight. The keepers would let them out after zoo hours and bring them back indoors in the morning just before the zoo would open. This happened without prior notification to the researchers. This may have affected data collection during the latter half of this study because the animals had longer access to the enriched area, access occurred at different times and when zoo patrons were not in the area. The researcher was also unable to observe these animals in their outdoor habitat during this time.

Future Studies: Further observations should be conducted for more conclusive evidence to support the evidence of a decrease in abnormal behaviors in the gibbons from this study and an increase in species-specific behaviors. These studies should include a way to measure the effectiveness of the enrichment techniques implemented in order to better comprehend how to encourage positive behaviors in the animals. Additional studies including animals from other zoos and in other habitats would provide a better understanding of captive white-cheeked gibbon behavior as well. When constructing new habitats in the future, observations of the animals' behavior before introduction into the new habitat should be completed to provide a control to measure changes in behavior associated with the animals' move into the newer enclosure.

Conclusion:

Captive animals housed in substandard habitats may begin to show abnormal behaviors due to excessive stress. One way to mitigate these behaviors and to promote species-specific behaviors is through environmental enrichment and the use of natural substrates throughout the captive animal's enclosure. The construction of The Red Ape Reserve at the Oregon Zoo has implemented many enrichment techniques with the aim of increasing the species-specific behaviors of arboreality and brachiation in their captive northern white cheeked gibbons (*Nomascus leucogneys*

leucogneys). These renovations substantially increased these behaviors in the experimental pair of gibbon. Access to the enclosures with increased enrichment for short periods of time (two hours) daily also increased the activity levels of the experimental pair of white cheeked gibbons. More observations will need to be conducted on a larger sample size in order to universalize these results. Additional observations on these four gibbons at the Oregon Zoo will also be helpful in creating supplementary data points to ensure accurate results.

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Appendix I: Sample White-Cheeked Gibbon Ethogram

Start Time	Stop Time	Duration of Scan	Observer	Male	Female	Weather	Time Since Pair Switch

Time	Sex	Out of Sight	Location	Elevation	Proximity to Partner	Proximity to Inje	Proximity to Kutai	Locomotion / Posture	Activity
1	M								
	F								
2	M								
	F								
3	M								
	F								
4	M								
	F								
5	M								
	F								
6	M								
	F								
7	M								
	F								
8	M								
	F								
9	M								
	F								

Appendix II: Code Sheet and Definitions

Out of Sight

- The gibbon is not visible

Location

- Indoor one (I1): Orangutan Exhibit. This zone is defined as the room that the orangutans have access to. It is the first indoor enclosure of the Red Ape Reserve. The following are areas that the Gibbons may be found in this zone:
 - The ground: G
 - Log bridges (1 & 2): LB
 - Wooden pillar (1-7): WP
 - Far logs (1 & 2): FL
 - Close logs (1-7): CL
 - Ropes: R
 - Metal platform: M
 - Back wall: BW
 - Viewing window: W
- Indoor 2 (I2): Phyllis and Duffy's Enclosure. This zone encompasses the second indoor enclosure of the Red Ape Reserve that Phyllis and Duffy have access to. The following areas are possible areas the gibbons may inhabit:
 - Middle Tree: (T)
 - Branches of the middle tree: TB
 - Rock in the far right corner: WRK
 - Log: L
 - Small tree in the back of enclosure: ST
 - Tree built into the back wall: TW
 - Ropes: R
 - Plastic platform: PP
 - Rocks on the left side of the enclosure: RB
 - Ground: G
 - Viewing window: VW
 - Bamboo: BM
 - Middle Tree: T
- Indoor 3 (I3): Nancy and Gunther's Enclosure. This zone consists of the gibbon enclosure that had not been remodeled to increase species-specific behavior. It is adjacent to Phyllis and Duffy's enclosure. This zone includes the following possible areas to spot Nancy and Gunther:
 - Logs: L
 - Viewing Gate: VG
 - Ground: G
 - Platform on wall: P1-P7
 - Hammock: HMK
 - Ropes: R
 - Metal ladder: ML
- Zone 1 (Z1): This zone includes the entire outdoor exhibit to the east of the tree tunnel entrance to the indoor portion of the Red Ape Reserve. It can be viewed from the outdoor walkway or through a glass window in the indoor portion of the exhibit. Areas to find gibbons in this zone include:
 - Outdoor viewer platform: VP
 - Ceiling: CL

- Back gate (looking from the outside viewing area): BG
- Side Gate: SG
- Front gate (looking from the outside viewing area): FG
- Large wooden pillars: WP
- Ropes: R
- Rock platform near indoor viewing area: RPF
- Back cages: BC1(Nancy and Gunther’s access chute), BC2 (Phyllis and Duffy’s access chute)
- Ground: G
- Metal Platform: MP
- Tree branch: TB
- Logs: L
- Rock bed surrounding the small waterfall (near indoor viewing area): FRK
- Zone 2 (Z2): This zone is comprised of the entire outdoor area to the west of the tree tunnel entrance. It can be viewed from two outside viewing areas and an indoor viewing window adjacent to the orangutan indoor enclosure. The gibbons can be found in/on the following areas in this zone:
 - Enrichment tree: ET
 - Log: L
 - Side gate: SG
 - Tree tunnel: TT
 - Ceiling: CL
 - Rock pile: RP
 - Viewing window: VW
 - Ropes: R
 - Ground: G
 - Keeper door that looks like a rock: RD

Elevation

- 0: On the ground
- 1: Less than 2 meters
- 2: Between 2 and 4 meters
- 3: Over 4 meters

Proximity to Partner

- - : less than 2 meters away
- + : more than 2 meters away

Proximity to Inje

- - : less than 2 meters away
- + : more than 2 meters away

Proximity to Kutai

- - : less than 2 meters away
- + : more than 2 meters away

Locomotion and Posture

- BR: Brachiating
- HA: Hanging
- S: Sitting

- BW: Bipedal walking
- QW: Quadrupedal walking
- L: Laying
- CL: Climbing
- J: Jumping
- HW: Hold walking (when the animal is walking bipedally while holding on to an object with their hands for support)

Activity

- E: Eating
- P: Playing
- VS: Solo Vocalization
- VD: Vocalizing in a duet
- G: Self grooming
- GAI: Initiate allogrooming
- GAR: Receive allogrooming
- F: Foraging
- SI: Social interaction
- LOE: Looking around enclosure
- LOV: Looking at viewers
- LOP: Looking at partner
- LOOP: Looking at other pair of gibbon
- LOO: Looking at an Orangutan – when occurs specify which orangutan
- R: Rest
- M: In movement
- SX: Sexual behavior

The Synthesis and Characterization of SNAFR-5 Derivatives

By Jia Li Zhao

Faculty mentor: Dr. Robert M. Strongin

Abstract

The synthesis and characterization of a new series of long wavelength and NIR-active dyes for use as diagnostic indicators in biological fluids has been carried out. The dyes are synthesized by a one-pot acid promoted condensation and isolated by flash column chromatography. Their structures are assigned by NMR and mass spectrometry. The spectral properties are evaluated by UV-vis and fluorescence spectroscopy. Preliminary spectroscopic data reveal these dyes exhibit anticipated characteristics that apparently meet the current requirements as NIR-active dye candidates for bioimaging and medical applications.

Introduction

Among the absorbing and emitting near infrared (NIR) dyes, there is only one that is FDA approved. Strongin¹ has recently reviewed the current literatures on the synthesis and evaluation of new NIR dyes including phthalocyanines, cyanines, and squaraines. These exhibit many outstanding properties, but their use in biomedical research may be restricted by aqueous insolubility, aggregation, small Stoke's shifts, and/or relatively larger molecular weight. Thus, there is a general need for simple innovative NIR-active dyes.² Xanthene dyes such as fluorescein are relatively non-toxic to humans; however, they are typically not NIR active. To help meet criteria for medical purposes, fluorophores in the xanthene series that are being developed in the Strongin group reveal a combination of desirable traits including 1) comparatively low molecular weight, 2) aqueous solubility, 3) dual excitation and emission in the forms of neutral and anionic species, 4) readily attainable changes in the regiochemistry of benzannulation and the ionizable groups resulting in tunable deep-red to NIR emission, and 5) large Stoke's shifts. The structures of SNAFR-5 (seminaphthofluorone) derivatives investigated in my research are depicted in Fig.1. Herein I describe studies of **2**.

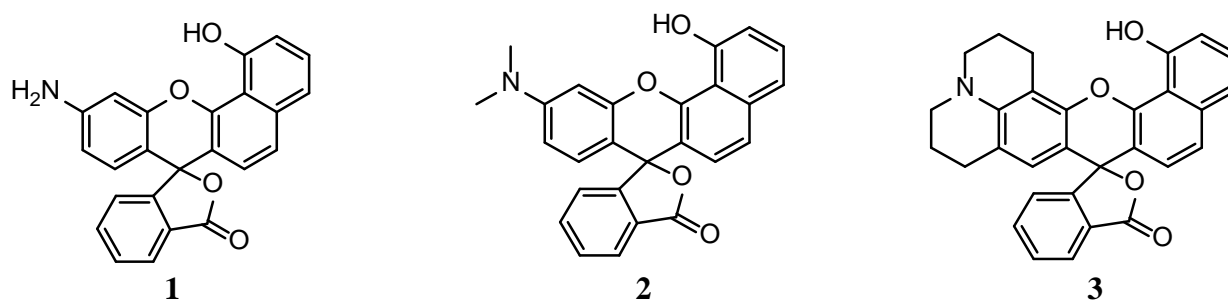
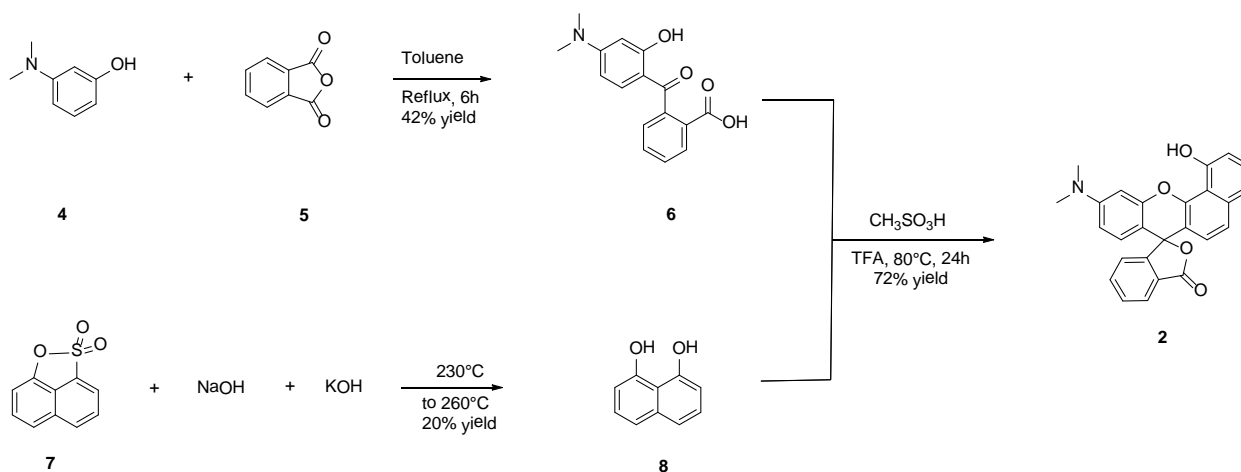


Fig.1. Structures of SNAFR-5 dyes

Materials and Methods

Shown in Scheme 1 is the synthesis of a new NIR-active derivative **2**. This method involved a one-pot condensation under acidic conditions of a hydroxyl benzophenone **6** with the corresponding dihydroxynaphthalene **8**. The corresponding hydroxyl benzophenone **6** is obtained by reaction of 3-dimethylaminophenol **4** with phthalic anhydride in toluene under reflux conditions. 1, 8-Dihydroxynaphthalene **8** is obtained by basic fusion of 1, 8-naphthosulfone **7**. Compound **2** was isolated and purified by flash chromatography and characterized by ^1H NMR, ^{13}C NMR, and MS.

Absorption measurements and titrations were performed with a Cary 50 UV-Vis spectrophotometer. Absorption maxima were obtained for dye concentrations of 40, 20, 10, 5 and 2.5 μM . Titration samples were prepared with dye concentrations of 8 μM in 200 mM phosphate buffers of pH from 5 to 9. Extinction coefficients (ϵ) were determined by Beer's Law calculations; $\text{p}K_a$ values were determined by linear regression analysis of the absorbance data obtained.



Scheme 1. Synthesis of new type [c] derivative

Result and Discussion

Synthesis

Shown in Figs. 2 and 3, ^1H NMR and ^{13}C NMR (Fig 2) data reveal the correlated structure of compound **2**. Shown in Fig. 4 is the MS data, the observed m/z is 410.1392, within 1.25 ppm mass accuracy, and there is a 72% yield.

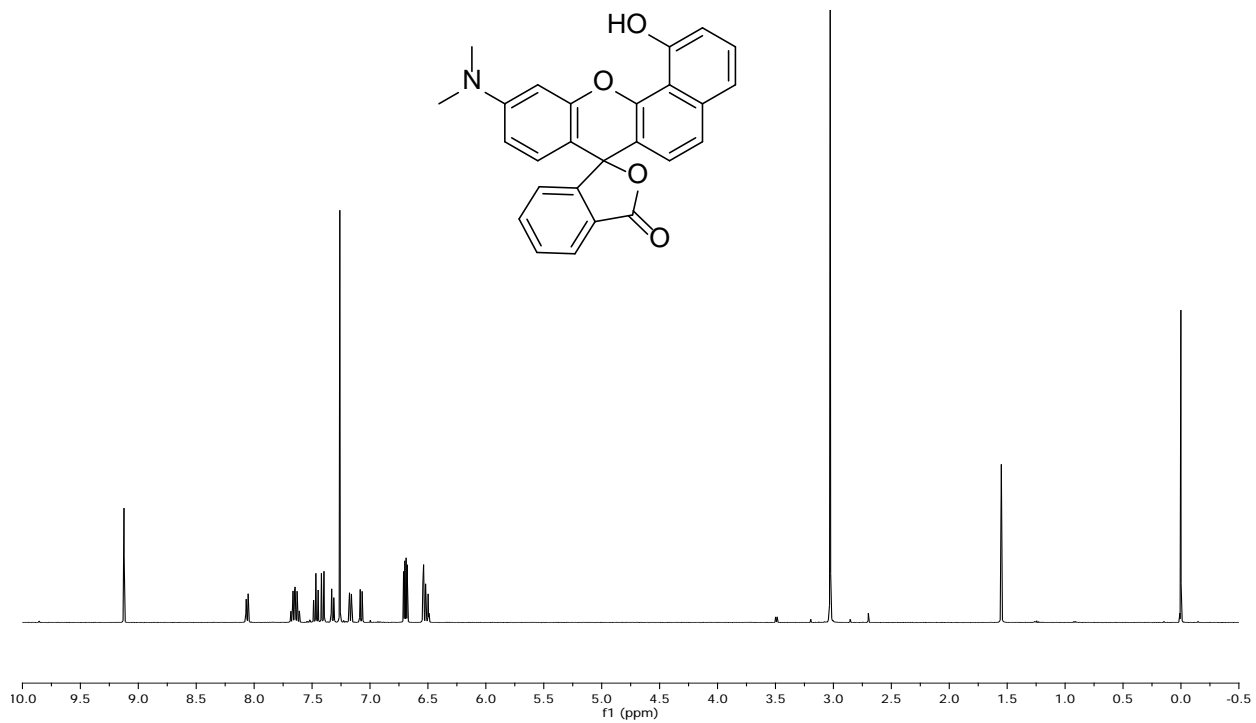


Fig. 2. ^1H NMR Spectrum of Compound 2

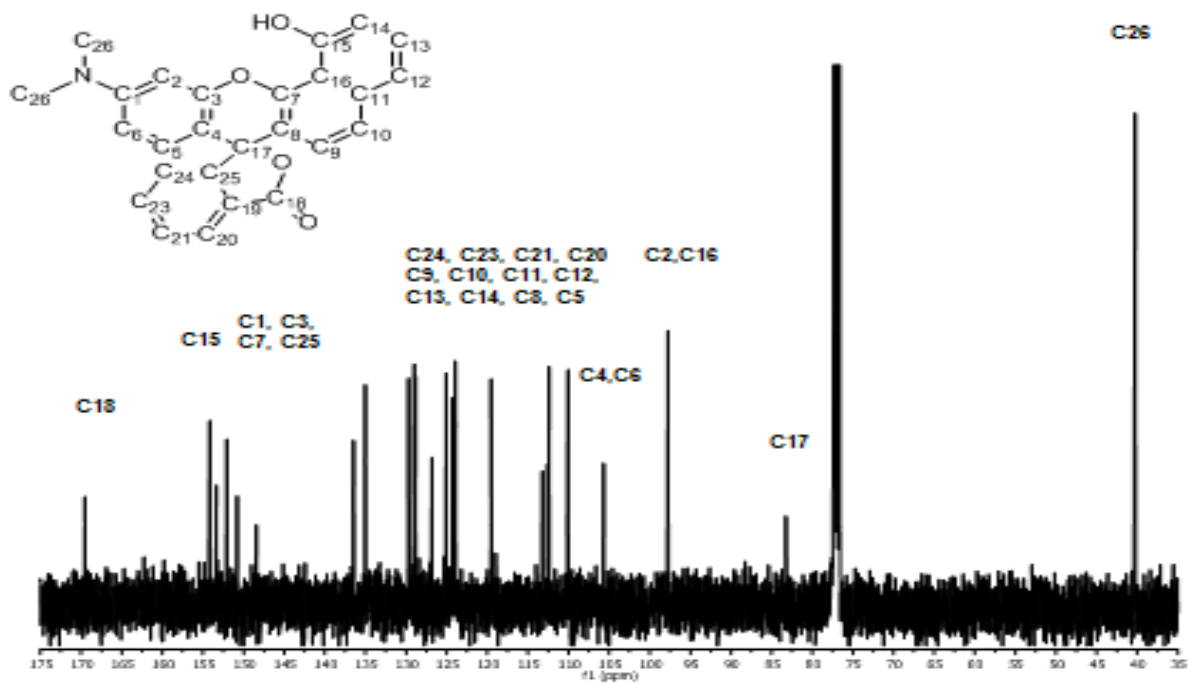


Fig. 3. ^{13}C NMR Spectrum of Compound 2

2010101106 #19-28 RT: 0.15-0.22 AV: 10 NL: 4.50E7
T: FTMS + p ESI Full ms [100.00-1207.87]

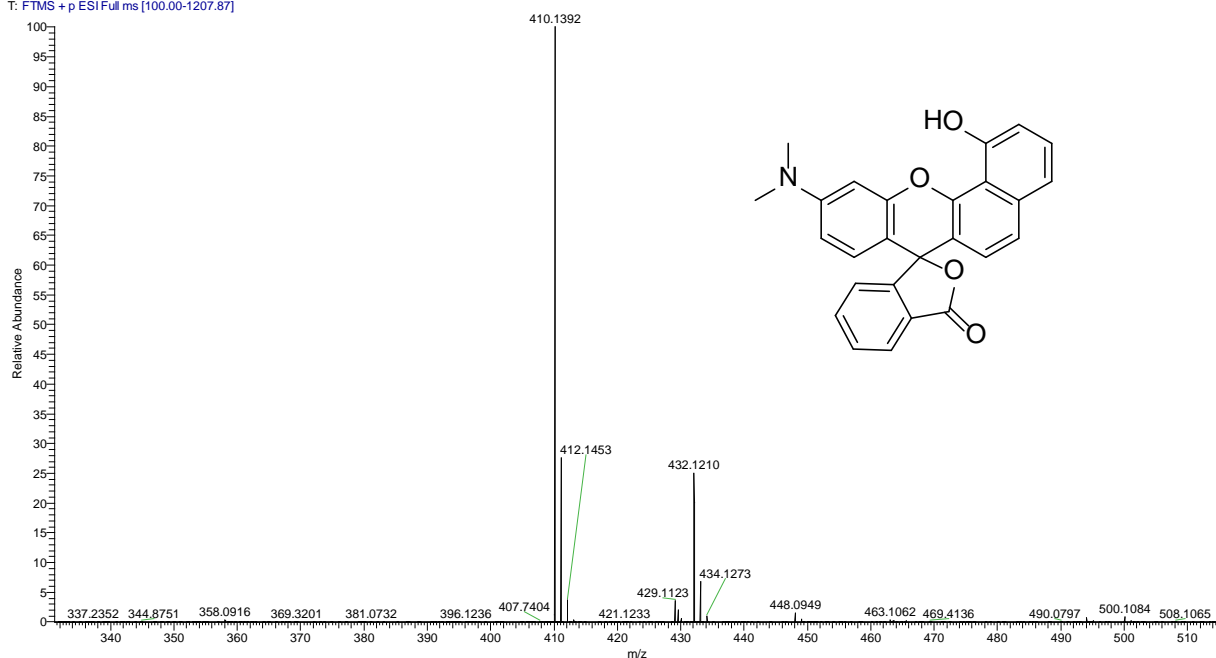
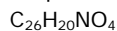


Fig. 4 HR ESI Mass Spectrum of Compound 2



m/z $[M+H^+]$ Calculated: 410.1386

m/z $[M+H^+]$ Observed: 410.1392

Mass accuracy: 1.25 ppm

Characterization

Extinction Coefficient

Standard calculation by Beer's Law, the extinction coefficient of compound **2** is obtained in 5%MeOH / 95%NaOH is $33048 \pm 591 \text{ cm}^{-1}\text{M}^{-1}$. This is a promising discovery. With this large extinction coefficient, absorbance of the dye in anionic form is extremely high, which will help for further characterization and analysis in biological fluid.

pKa Value

pKa values were obtained by linear regression analysis of the absorbance data. As shown in Fig. 5, compound **2** is pH sensitive in absorption intensity with good isosbestic points. The pKa value is calculated in anionic and cationic forms to be 7.0. Another promising finding, with this pKa value very close to neutral, it is could also be a very useful pH sensor in biological fluids.

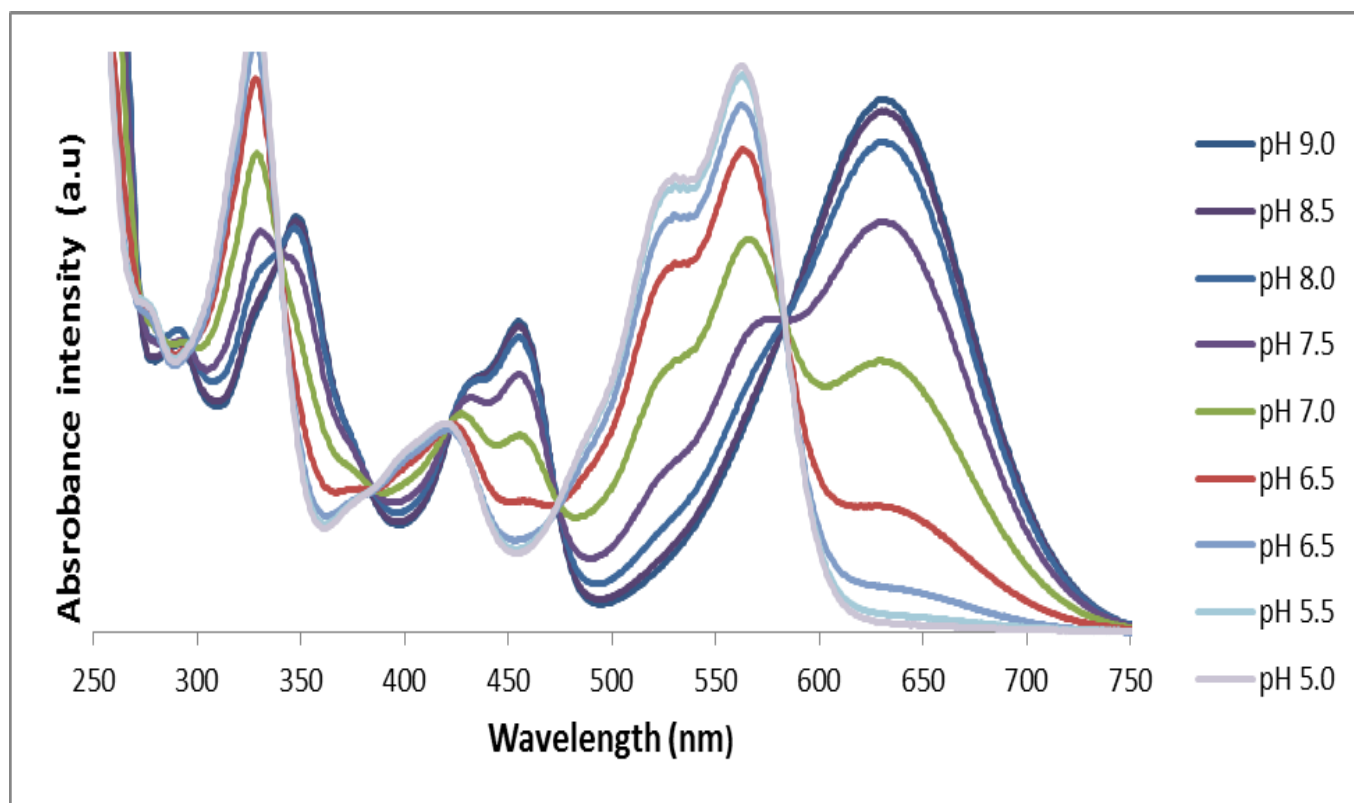


Fig. 5. Absorption spectra of 8 μM compound 2 in 200 mM phosphate buffer solution of various pH

Additional characterization such as wavelength of maximum excitation and maximum emission, Stokes shift, quantum yields and Excitation-Emission Matrix (EEM) will be done on this series of seminaphthofluones before application studies in biological fluids.

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