

H O H O N U

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Academic Journal

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Letter from the Editor

"Far and away the best prize that life offers is the chance to work hard at work worth doing."
 –Theodore Roosevelt

Hohonu is not just an academic journal. It is a community where University of Hawaii at Hilo students are given the opportunity to gather and work together to achieve a common goal. It has been a long year for Hohonu, as many of the staff members, including myself, are new to this experience. However, with the continuous effort and enthusiasm exemplified by our staff and our amazing authors, we were able to produce an incredible issue with great diversity. Indeed, I am proud to announce that we have achieved our "best prize."

This year's issue of Hohonu would not have been possible without the incredible dedication to the journal by the 2014-2015 Hohonu staff: Asia Howe, Valentina Martinez, and Hannah Lipman, along with our faculty advisor Dr. Kirsten Møllegaard, who has gone above and beyond to make our achievement possible. I am sincerely thankful for all your hard work and endless support throughout the year. Furthermore, I would like to thank the Board of Student Publications Chair Matthew Kalahiki for guiding the Hohonu staff, including myself, through the hardships endured during this long journey. Without your generous contribution, we would not be where we are today. We wish you the best of luck next year! I would also like to take this time to thank Destiny Rodrigues for organizing our finances and helping our staff members to be a part of Hohonu. Thank you Campus Center and the other CSO organizations for providing support and opportunities to publicize our journal around the UH Hilo Campus. Many thanks to Erynn Tanimoto, Darin Igawa and Kelcie Valbuena from the Graphics Department for helping us with layout, printing, and all in all, putting the publication together. Hohonu would of not have been possible without your extensive effort. I would also like to congratulate Valentine Vaeoso for the wonderful cover art design for this year's issue. Your talent and contribution were greatly appreciated. Most importantly, I would like to thank the authors who have submitted to the publication this year. Without your courage and determination, volume 12 of Hohonu would not have been possible.

This year's issue of Hohonu may be shorter than the previous issues, but it contains heart and passion. Our authors have worked incredibly hard to publish their work so please take the time to read what they have written. Take the time to think about the issues addressed, the research presented, and the unthinkable topics that the authors covered and think about how it affects you, your views, and your beliefs, and truly acknowledge their work. Find inspiration in their writing and share that inspiration with others. You never know what you will learn, and how it will affect you in the future. We are honored to present the works of these talented authors in the 12th edition of Hohonu, and we hope you enjoy the issue.

Samantha Howell
 Editor In Chief
 howellsa@hawaii.edu

About the Cover Artwork

A great Polynesian poet once said, "We are the Sea, we are the Ocean, we are Oceania." Hawaii is part of that Oceania. This cover art shows a collection of symbols and patterns that best define the beauty of the Hawaiian Islands, the people that reside there, and their culture. One of the first shapes that capture one's attention is the enchanting shape of the waves, which represents the peoples' love and honor for the ocean. The honu (sea turtle), with its various designs, illustrate the belief that turtles were the first to guide the Polynesians to the Hawaiian Islands, making them a symbol of the navigator that is able to find its way home. We can also see the symbols of fish and birds, which depict the land and marine life that surround the Hawaiian Islands, and the beautiful flowers represent Hawai'i's welcoming spirit in the form of a flower lei. Finally, the multiple patterns under the waves represent a diverse community and culture in the Islands of Hawaii.

Misperceptions of the "Hula Girl"

Noah Dolim
Personal essay

The sound of a steel guitar twangs in the background as the camera pans across the length of Diamond Head. A fair-skinned "Hawaiian" woman dances on the shores of beautiful Waikīkī. Wrapped in a grass or cellophane skirt, her hips sway seductively to-and-fro. She is adorned with tropical flowers, complete with a coconut bra. A visitor watches her from his seat at the tiki bar. The bar is lined with wooden images, and torches surround the perimeter. Another slender maiden brings him an alcoholic beverage.

Perhaps the image most affiliated with Hawai'i and Hawaiian culture, both past and present, is the "hula girl". The hula girl graces the cover of tourist media, such as in *This Week* magazine, which features a different model on every cover. She is found on a host of different product labels, from chocolate to water bottles, each company trying to market their product as "Hawaiian". The hula girl is so commonly exploited in tourism that she has become the perceived identity of Hawaiian women and Hawai'i. The hula girl image, a product of tourism, has genderized Hawai'i and created a stereotypical view of Hawaiian identity.

The tourist industry has been a part of Hawai'i for well over 100 years, from the days of the monarchy until the present. One of the early publications that promoted tourism was *The Paradise of the Pacific* (1888), a magazine run by Thomas G. Thrum. This guide was specifically made for tourists and businesses in Hawai'i. *Paradise* contained information on "climate, natural scenery and volcanic wonders, tropic life and travel."¹ The magazine was highly successful by 1900; of 5000 subscribers, only 500 lived in Hawai'i.²

In 1903, the Territory of Hawai'i started to get involved in promotion as well. Previously, the monarchy of Hawai'i had been overthrown in 1893 by Euro-American businessmen. By 1898, Hawai'i had also been "annexed" by joint resolution to the United States. Although Hawai'i was already well known throughout the world, this event put a beacon on Hawai'i as a tourist destination. As a result, the Hawaii Promotion Committee was created. One problem the Committee faced were tourists' interests in the exotic. It wanted to promote Hawai'i as a wild paradise, "while still promoting Hawai'i as a safe and modern American destination."³ Hula became an important vessel in feminizing Hawai'i, which supported the interests of the Territorial government and the tourist industry.

It is believed that hula originated from the dances that evolved during the migration and settlement of ancient Oceania. As the ancient Oceanic people traveled and dispersed from the Malay Peninsula down into Papua New Guinea and back up into the greater

Pacific, dances were created and transplanted. Some dances look very similar, while some look very different; every dance is unique. This migration pattern of hula is also found in Hawaiian mo'olelo.⁴

In the mo'olelo of La'amaikahiki, La'amaikahiki brings the pahu (drum) and kā'eke'eke (bamboo sticks) to Hawai'i from his home in Kahiki. Kahiki can refer to Tahiti or to an ancestral homeland located south of Hawai'i. Besides introducing the implements, La'a traveled throughout Hawai'i to teach people how to perform hula.⁵ The scientific study of migration patterns reaffirms the migrations presented in this mo'olelo, as well as the evolution of hula.

Some of the most important figures in hula tradition are Laka, Kapo'ulakīna'u, Hi'iaka, and Pele. Both Laka and Kapo'ulakīna'u are regarded as being akua (deity) of hula. Kapo'ulakīna'u is thought to be the first akua of hula. Laka inhabits the forest realm which is where many adornments are found (ferns, flowers, vines, etc.). Both of these akua are honored in many hula mele (songs) and oli (chants).⁶ Although Kapo'ulakīna'u and Laka are deities of hula, it can be argued that Pele and her sister Hi'iaka are the most revered figures in hula tradition.

There are numerous mo'olelo, mele, and oli regarding Pele and Hi'iaka that have been passed down through oral and written traditions. Pele is well known in Hawai'i because of her physical manifestation, the lua pele (volcano) and lava. She also takes on both akua and human forms. Pele creates new land by destroying old land. Hi'iaka's manifestation is the new vegetative growth after a lava flow. The two sisters constantly oppose each other, yet have an unconditional love for one another. Their physical manifestations are evidence of the dualistic balance of Hawaiian tradition. Both Pele and Hi'iaka are models of powerful Hawaiian women. In the mo'olelo, Pele and Hi'iaka interact with Laka and practice hula traditions. Their power, along with their connection to the origins of hula, make them important figures in the hula realm.

Pele and Hi'iaka also played an important part in Hawaiian media in the Republic of Hawai'i. In 1901, Joseph M. Poepoe published the famous mo'olelo Hi'iakaikapoliopole in the newspaper. In short, the mo'olelo tells of Pele's and Hi'iaka's adventure, battle, emotions, and inner transformations. This mo'olelo reinforces the traditional view of Hawaiian women as being powerful and independent. By publishing these mo'olelo, Poepoe reminded Hawaiian women that they were not bound to western gender roles or constricts.⁷

Like many indigenous traditions, hula cannot be fully defined by western terminology, it can only be explained. Hula is an art form, a tradition, and a dance. It is composed of different facets such as the mele, oli, the physical motions, and the use of implements. Hula has many purposes such as honoring a person, retelling a mo'olelo, describing wahi pana (place of significance), or reciting genealogy. These themes are just on the

surface level of understanding. Hula also encompasses kaona, which are concealed meanings or metaphors. Kaona can take a phrase or description to a deeper level, often sexual or political. Hawaiians were and are skilled at using kaona within composition. If one is not aware of kaona, a hidden reference can easily be missed. Poepoe's publishing of *Hi'iakaikapoliopole* provided kaona to reaffirm the power of Hawaiian women.

After the Hawaiian monarchy was overthrown, the new government suppressed Hawaiian culture and practices in order to push the people of Hawai'i towards Americanization. However, the tourism industry still relied on Hawaiian culture to provide an exotic experience for visitors. Thus, "hula kitsch" was born. Kitsch is "something that appeals to popular or low-brow taste and is often of poor quality."⁸ Hula kitsch became the creation of the haole businessmen; it was a way to promote "Hawaiian culture" without Hawaiians. This sub-culture was more American than Hawaiian. In "Hawaiians On Tour" (2004), Adria Imada called this "imperialist nostalgia." The colonizers (Euro-Americans) have nostalgic feelings for the traditions that they had suppressed. Instead of letting Hawaiians perform their own culture, they took it upon themselves to be cultural stewards in order to "save" hula.⁹

In *The Art of Hula*, Allen Seiden stated that, "hula had become connected to the growing tourist trade, transformed from a dance that supplemented meaningful chants to a style of dance with sensual gestures and romantic imagery as the most important components."¹⁰ Hula kitsch really commercialized the ancient, meaningful practice of hula into something cheap, and widely accessible. Unlike other writers or scholars, Seiden failed to criticize the negative cultural effects of kitsch. He believed kitsch was part of the hula revival, which is true in some sense – but what was the reason for the revival? It was the combination of "imperialist nostalgia" and capitalism. Hula kitsch was very popular for a majority of the 20th century. Although not as popular in the present, it still exists in different forms.

Kitsch did not only affect the dance but also the perception of Hawai'i. The hula girl image had already been used before the 1900s, but at the turn of the century the image really exploded, due to tourism promotion. The image became the premier symbol of Hawai'i. Hula dancers and musicians became some of the most popular images used for colored postcards.¹¹ The image was also used in business ads, figurines, and lamps. One of the most recognized uses of the image is the hula girl dashboard figurine with movable hips.¹²

Another interesting observation is the physical appearance of the hula girl. The standard hula girl was depicted as beautiful young woman or girl with a slim upper body and wide hips. In some cases the female body is highly accentuated, creating unrealistic body proportions. The female usually wears a grass, raffia, or cellophane skirt as the bottom garment and a coconut

bra for the top garment. The cellophane skirt became popular in the Hollywood movies of the 1950s.¹³ Coconut bras were never a part of traditional hula. Of course, the hula girl would be adorned with flowers, with a welcoming smile; capturing the "true spirit of aloha". It is a very sensual and romanticized depiction of so called "Hawai'i."

Many depictions use a very light skinned woman or a Caucasian woman. The use of a lighter skinned woman appealed to the Western audience, portraying Hawai'i as American and civilized. This contributed to the figurative displacement of Hawaiians from Hawai'i, a "Hawaiian-less Hawai'i". In *Legendary Hawai'i*, Bacchilega stated that portrayals of Hawai'i showcased the so-called exotic paradise while excluding Hawaiian people. Tourists experienced what they believed to be authentic culture, but in reality they were just experiencing kitsch. The commercial use of the hula girl promoted hula as cultural but it was actually just a means for entertainment value.¹⁴

As mentioned before, Hawaiian people have been moved to the background as secondary characters in the landscape of Hawai'i. The average tourists' experience in Hawai'i is no different than a trip to Disneyland. This applies to the past as well as the present. A tourist comes to Hawai'i, goes sight seeing, and leaves with a vague understanding or misunderstanding of Hawaiian culture. There is a definite divide in the interaction between tourists and Hawaiians/Hawaiian culture.

In Julie Kaomea's article, "A Curriculum of Aloha?" (2000), she revealed that hula kitsch had even made its way into the educational system of Hawai'i. In one of her experiments, she asked children to describe Native Hawaiians. According to the children, Hawaiian women were 'very pretty'; Hawaiians (as a whole) 'ware [wear] different comtumuse [costumes]' and 'play nice music'; they are 'kind' and the 'nicest people [they] know'. In a visual representation of a Hawaiian female, a child drew a stereotypical hula girl.¹⁵

Kaomea's primary focus in her study was on the textbook, *Hawaii the Aloha State* (Bauer 1982).¹⁶ She immediately pointed out the name of the textbook, as it shares its name with numerous books about tourism. Kaomea called this "a critical clue" of what she expected to find within the book.¹⁷

The textbook layout was that of a tourist guide. The chapters were divided by islands with the name of the each chapter being the island name, followed by the island nickname. Kaomea then said that the subsections within chapters were divided by "site-worthy attractions." One subsection said 'Shopping along the main street of Waikiki...is a must for all malihines [malihini] or tourist' and that 'no holiday...is complete without going to at least one luau.'¹⁸ The textbook also included postcard-like photos of Hawaiian "hula girls."¹⁹

It is hard to believe that kitsch culture has even become accepted as authentic by the educational

system in Hawai'i. This could have a great influence on how young Hawaiian children see their culture and their own selves. It teaches Hawaiians to believe in stereotypes and to accept tourism as a normal part of life, a part of the "aloha spirit". On a broader scale, it also teaches Hawaiians that they are naturally hospitable, therefore submissive to others. Kaomea believed that the educational system is grooming the children of Hawai'i, both Hawaiian and non-Hawaiian, to enter the tourist industry in positions of servitude.²⁰

In the case of the Hawaiian female, she is led to believe that she must be as beautiful and thin as the commercialized hula girl; because her body is now an exhibition for tourists. These books put western gender perspectives in the minds of young Hawaiians: the Hawaiian female is destined to become a hula girl because that is what Hawaiian women do. Coupled with stereotyped hospitality, the Hawaiian female has become the ultra submissive female.

The Hawaiian female body is the focal point in Jane Desmond's article, "Invoking 'The Native': Body Politics in Contemporary Hawaiian Tourist Shows"(1997).²¹ Tourist shows have been a main staple of hula kitsch and continue to be a major tourism draw. According to data compiled by the Hawai'i Tourism Authority for the 2011 calendar year, over seven million visitors traveled to Hawai'i. About 41% of those visitors came from the Western United States and 23% from the Eastern United States. Both of these locations provide the majority of tourists to Hawai'i.²² About 30% of Western U.S. visitors and 49% of Eastern U.S. visitors attended a "Polynesian show/luau/hula".²³ Desmond states that these "commercial Hawaiian lū'au both require and feature the visible display of bodies perceived as 'native' or 'Hawaiian' by the mainlander viewing audience." The use of "native" bodies reassures the visitor that Hawai'i is still "Hawaiian."²⁴

As part of her research process, Desmond went to Germaine's Luau in Honolulu. Her experience showed that hula kitsch is still a major factor in tourism. These lū'au companies know what tourists expect "Hawaiians" to be like, so the tourists are given a stereotyped "Hawaiian" fantasy. One of the main points she makes about her lū'au experience is the emphasis on sex and the native body. Her bus driver on the way to the lū'au, "Captain Bob", made an offensive joke about Hawaiian sexuality and he also made the passengers give back rubs to one another.²⁵ Before the start of the show, everybody was forced to give a lei to another person, then give that person, who must be of the opposite sex, a kiss on the cheek. Following the "ceremony," visitors were able to take a picture with one of the male or female "natives." Desmond says this staged photography is the way visitors "mark the encounter with the 'exotic'."²⁶

After overusing the words "ohana" and "aloha" numerous times, the lū'au host forced the audience to honi. Honi is a traditional custom of sharing breath with another person, which is spiritual and sincere. However,

the host used honi in order to continue the sexual context of the show. Hula made its first appearance when 50 female visitors were asked to dance to "Hukilau". Then once again, another session of "honi," followed by three male visitors dancing in coconut bras and fake skirts.

Finally, the "teaching-the-tourist-to-dance motif," as Desmond calls it occurred: a male volunteer was called up to dance with female entertainer. Of course, the male volunteer embarrassed himself, while the lū'au host continued to make sexual references. The result of this performance is the contrast between the non-existent sensuality of the male and the sensuality of the "native" female. The Hawaiian female is portrayed as "primitive" and "closer to nature" thus making them more sexual than westerners.²⁷

Desmond also observed the physical appearance of the dancers. The men were young and muscular, while the women are young and slim. The women were mostly of the hapa-haole (mixed Caucasian) look. She pointed out that it is rare to find an Oriental looking female at these shows, a look that is common in Hawai'i. A "black" (African-American) look is out of the question; Desmond says that Melanesian dancers are rare as well, because tourists could mistake them as African-Americans.²⁸

In contrast, Desmond talks about attending a fundraiser for Mapuana de Silva's hālau the day after the lū'au show. At the fundraiser, there were all types of female "bodies" present: Hawaiian, Haole, Oriental, young, and old. At this event, hula was performed by different varieties of bodies, instead of just one type of body. Unlike the female dancers of the commercial lū'au shows, who are picked by their physical appearance, which must fit the hula girl archetype.²⁹ Once again, the tourists are fed the images they expect to see, a process that continues the perpetuation of the "native female."

The final way the "hula girl" affects Hawaiians is by genderizing Hawai'i as female. In Haunani K. Trask's well-known essay, "Lovely Hula Hands" (1999), she compares the relationship of Hawai'i and tourism to that of a prostitute and pimp. She criticizes capitalism as the factor in the destruction of lands and culture. The tourist industry has exploited Hawaiians and Hawaiian culture, convincing the people of Hawai'i that tourism is a "natural" part of culture.³⁰ This is very similar to what Kaomea said in "A Curriculum of Aloha?"

Trask also argued, "Hawai'i itself is the female object of degraded and victimized sexual value."³¹ She (the land) is purchased and used for industrialism and militarization. As the "prostitute," Hawai'i offers four services: Hula, aloha, u'i (the beauty of young Hawaiians), and the allure of Hawai'i itself. Hula within tourism is without sacredness. It is hyper sexualized and a form of packaged entertainment. Trask also stated that "aloha" has been over used to the point where it has lost its meaning. A powerful word that is unique to Hawaiian language has now been regulated to something that is just tossed around freely, such as the example in Desmond's experience at the lū'au.³² Trask concludes,

"Thus, Hawai'i, like a lovely woman, is there for the taking...Just as the pimp regulates prices and guards the commodity of the prostitute, so the state bargains with developers for access to Hawaiian land and culture."³³

In the article "Military Presence/Missionary Past", the authors use Trask's views on tourism to pertain to militarization. Once again, Hawai'i is the submissive "hula girl," but this time she needs protection from a masculine source: The U.S. military. Hawai'i invites the masculine source to control and protect her.³⁴ As a result, the U.S. military has "protected" a large portion of land in Hawai'i, making Hawai'i the most militarized state in the U.S.

In conclusion, the hula girl image, a product of tourism, has genderized Hawai'i and created a stereotypical view of Hawaiian identity. From the beginning of the Hawai'i tourist industry in the late 1800s until the present, the hula girl has remained the mascot of Hawai'i. One can go to any party supply store and easily find a hula girl costume. It is disappointing that local companies are contributing to the exploitation of Hawaiian culture. The hula girl has greatly affected the identity of the Hawaiian female, turning them from powerful women to submissive girls. The hula girl has feminized the islands of Hawai'i, thus inviting the U.S. military to protect the beautiful damsel in distress. Hawaiians need to remember or realize, that there is nothing natural about tourism or militarism. It is not Hawai'i's fate or destiny. As Lisa Kahaleole Hall writes:

A culture without dignity cannot be conceived of as having sovereign rights, and the repeated marketing of kitsch Hawaiian-ness leads to non-Hawaiians' misunderstanding and degradation of Hawaiian culture and history. Bombarded by such kitsch along with images of leisure and paradise, non-Hawaiians fail to take Hawaiian sovereignty seriously and Hawaiian activism remains invisible to the mainstream.³⁵

If the hula girl and other western stereotypes of Hawai'i can be exterminated, dignity and pride can be reclaimed, not just by Hawaiian women, but for all Hawaiians. Hawaiians should remember that no other person or group could dictate who they think they are. This is what Joseph Poepoe knew when he published the mo'olelo of Pele and Hi'iaka. Hawaiian women are beautiful, powerful, independent, but never submissive, just as Hawai'i is.

Notes:

¹Christine Bacchilega. *Legendary Hawai'i and the Politics of Place: Tradition, Translation, and Tourism* (Pennsylvania: University of Pennsylvania Press, 2007), 66.

²Bacchilega, 68.

³Bacchilega, 102.

⁴Allen Seiden, *The Art of Hula: the Spirit, the History, the Legends*. (Hong Kong: Island Heritage Publishing, 2001), 22.

The term "mo'olelo" is a Hawaiian word. It can be defined as a story that contains humans and spiritual persons, places, and events. It is a blur between history, fiction, metaphor, and mythology. Mo'olelo are one of the most important parts of Hawaiian oral tradition.

⁵Seiden, 22.

⁶Seiden, 23.

⁷Noenoe K. Silva, "I Kū Mau Mau: How Kanaka Maoli Tried to Sustain National Identity Within the United States Political System", *American Studies* 45 no. 3, (2004), 25-26.

⁸Merriam-Webster Online, "kitsch", <http://www.merriam-webster.com/dictionary/kitsch>.

⁹Adria L. Imada, "Hawaiians on Tour: Hula Circuits through the American Empire", *American Quarterly* 56 no. 1, (2004). 119.

¹⁰Seiden, 84

¹¹Seiden, 86.

¹²Seiden, 92-93.

¹³Seiden, 87.

¹⁴Bacchilega, 17-18.

¹⁵Julie Kaomea, "A Curriculum of Aloha? Colonialism and Tourism in Hawai'i's Elementary Textbooks", *Curriculum Inquiry* 30 no. 3, (2000), 320.

¹⁶*Hawaii the Aloha State* (1982), *Hawaii Our Island State*, (1979) *Early Hawaiian Life* (1981).

¹⁷Kaomea, 325.

¹⁸Kaomea, 325-326.

¹⁹Kaomea, 330.

²⁰Kaomea, 335.

²¹Desmond's chooses to focus on Euro-American visitors, instead of including Japanese visitors.

²²Hawai'i Tourism Authority, "2011 Factsheet", (2011), 1. <http://www.hawaiiitourismauthority.org/default/assets/File/2011%20State%20Factsheet%20updated%208-21-12.pdf>

²³Hawai'i Tourism Authority, "2011 VSAT Report Activity Participation", (2011), 141, 143. [http://www.hawaiiitourismauthority.org/default/assets/File/reports/visitor-satisfaction/2011%20VSAT%20Report\(2\).pdf](http://www.hawaiiitourismauthority.org/default/assets/File/reports/visitor-satisfaction/2011%20VSAT%20Report(2).pdf)

²⁴Jane C. Desmond, "Invoking 'The Native': Body Politics in Contemporary Hawaiian Tourist Shows", *The MIT Press* 41 no. 5, (1997), 84.

²⁵Desmond, 93.

²⁶Desmond, 94.

²⁷Desmond, 95.

²⁸Desmond, 96.

²⁹Desmond, 96.

³⁰Haunani-Kay Trask, *From A Native Daughter: Colonialism and Sovereignty in Hawai'i*. (Honolulu: University of Hawai'i Press, 1999), 137.

³¹Trask, 143.

³²Trask, 144.

³³Trask, 145.

³⁴Turnbull, Phyllis and Kathy E. Ferguson. "Military Presence/Missionary Past: The Historical Construction of Masculine Order and Feminine Hawai'i" *Social Process in Hawai'i: Sites, Identities, and Voices* 38 (1997), 98.

³⁵Lisa Kahaleole Hall, " 'Hawaiian at Heart' and Other Fictions", *The Contemporary Pacific* 17 no. 2, (2005), 409.

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Cumal to Kūmara: The Voyage of the Sweet Potato Across the Pacific¹

Jenna Harburg
History 316
Fall 2013



Staple Crops and Society

Food is the ultimate tool of unification. It is the greatest stepping-stone to human advancement; and the cultivation of staples is a major factor, which separates Homo sapiens from their simian cousins. Many of the partitions separating modern peoples are represented by their staple crop. Peoples out of East and Southeast Asia are heavily dependent on rice, and Russians and Scandinavians are dependent on the potato. In regions like France and western Germany, a meal without bread is impossible; the crops, which defined their ancestors, still continue to influence and divide. This is not to say that wars are held over the superiority of one crop when compared to another, but that diet can define a culture,² for it builds and influences language and thought. The introduction of the sweet potato into the Pacific is the source of multiple theories, which cite both human and natural agents. The theories will each be explained and an attempt to create a logical and likely theory of introduction will be made.

To the peoples of the Pacific, the sweet potato serves an important part of their diet. Yet the history of this simple food source is a point of major contention amongst historians and anthropologists. The sweet potato is native to South America, where it has been cultivated for approximately 4,000 – 5,000 years by indigenous communities². Evidence of the sweet potato has also been found in sites on Aotearoa, (New Zealand) which predate western contact by centuries.³ Given that scientists, archaeologists and cultural historians have proven that Pacific Islanders travelled out of Asia Minor, how did a crop from the other side of the Pacific become a staple in their diet? For some, it is impossible—researchers like Thor Heyerdahl credit drift theory for all action, which occurs in the Pacific. The arrival of the sweet potato was an accident of nature, rather than an act of an actively

voyaging and travelling people who were aware of their world. Others credit the Spanish voyages of the 16th and 17th centuries.⁴ However, the precise details of such a journey are nearly impossible to find. Nonetheless, the influences and changes made possible by a new, highly nutritious, and carbohydrate-dense crop are traceable through history and archaeology, painting a picture of a likely theory on the introduction of such an important staple.

How Were They Introduced to the Pacific?

There are many competing theories as to how the sweet potato was introduced to the Pacific. Natural causes, such as movement facilitated by birds or drift facilitated through oceanic currents are often cited, particularly by those who believe that the distance necessary to travel from the islands of Polynesia to the South American continent are impossible to do via voyaging canoe. Each will be addressed in turn.

Natural Agent Theories

Birds are responsible for the introduction of many species to the Pacific islands, as they are excellent at getting lost and at passing seeds through their digestive systems without affecting the plants ability to germinate. In fact, the scarification, which happens to the seeds inside the stomach of birds, can actually improve the seed's chances of germination upon exit of the digestion system.⁵ It is highly likely that this system of natural propagation allowed the spread of the sweet potato around South America. Making it possible for the natives of the continent to cultivate it, and for domesticated varieties to appear as widespread as they did. However, this theory does not hold true for the Pacific.

There are many varieties of birds, including Pacific Golden-Plovers, Bristle-thighed Curlews, Ruddy Turnstones, and Wandering Tattlers, which migrate to and from the Pacific.⁶ While it is possible for these birds to fly incredible distances without stopping, it is nearly impossible to imagine that they would do so without defecating. Even if it were the case, one would assume that sweet potato remnants, as well as other seeded plants native to South America such as tomatoes and squash, would show up in archeological records extremely early and be introduced long before humans first voyaged into the Pacific – but this is not the case.

The other argument for the “natural” spread of the sweet potato is that of currents – positing that the sweet potato, like the coconut,⁷ was able to propagate through a natural “ride” on currents and waves from the Western coastal areas of South America, likely Chile and Peru, into the Pacific. It was assumed by many that Rapa Nui, known as Easter Island, was the likely origin of the sweet potato, and from there a trade network arose. However, what was found was that the current coming off the coast of South America did not lead straight to Rapa Nui, but instead south along the coast and then, several thousand miles later, east towards the

Marquesas and Tuamotu, as well as others isles of the Society island groups. In any case, humans did not settle in Rapa Nui until 1200 AD, going on the most recent radio carbon dating.⁸ Still, evidence exists, which shows sweet potatoes in central Polynesia long before this. The oldest archaeological find is the carbonized remains of sweet potato in Polynesia come from Mangaia Island in the Cook Islands, dated to approximately 1000 A.D.⁹

Unfortunately, no studies have been done which show whether or not the sweet potato can survive extended periods in oceanic conditions. The voyage from coastal Peru or Northern Chile to Tuamotu, the Marquesas, or other Society Islands would take—in the best conditions weather—about 120 days to complete, or nearly four months.¹⁰ This amount of time approaches the oceanic shelf life of the coconut, which allows it to be better prepared for a long journey. The sweet potato lacks the thick, protective fibers and high water content of the coconut, the very characteristics that make the coconut not only a desirable and important crop, but also one that is able to survive for so long in the ocean and then successfully germinate in the sandy coastal soils it lands on.

Although the sweet potato prefers sandy loose soil, thus furthering this idea of self-propagation on pacific beaches, it requires the soil to be very well drained- it cannot survive and reproduce if it is too wet.¹¹ It is this biological predisposition that makes the idea that the sweet potato propagated under natural circumstances after a journey on an oceanic route driven by currents unlikely.

Given that the sweet potato, unlike the coconut, lacks an appropriate protective shell and cannot successfully grow in the wet, marshy soil on beaches, it is highly unlikely that it was introduced in this manner. No studies have been conducted on how long a sweet potato can survive in oceanic conditions, and thus for the purpose of this research, oceanic self-propagation may be ruled out. However, it is important to note that the only successfully propagated sweet potatoes are being considered; it is possible a non-producing plant could have made the journey. That is to say, at this point the idea of a viable sweet potato is impossible, not a dead or destroyed one.

Human Agent Theories

After the “natural” theories of introductions, there are several theories, which feature humans as the perpetrators of this pan-pacific interaction. There are those, like Thor Heyerdhal, who believe that “white skinned, bearded men” on balsawood rafts came from South America into the Pacific and were the main force in voyaging and expansion in the Pacific. Heyerdhal’s theory is incorrect and easily disproved on many levels; when one ignores the racist overtones of his efforts, he proved, at the very least, that such voyaging was possible. He was able to sail from South America to various islands of the Pacific on his raft, the “Kon Tiki,” in the 1940s.¹²

What is known to be true is that there have been fishing villages established along the coastal areas of South America and talented boat builders on Lake Titicaca for centuries. During the time period being considered for likely dispersal, approximately between 400 C.E. and 700 C.E., the Nazca culture was in full force, though on a steady decline from about 500 C.E. One of the many groups, which would later become the Incan empire, the Nazca settled in southern Peruvian river valleys. Sweet potato was an important part of their diet, while fish were rarely consumed. Therefore, while they were a true and large civilization, it may be suggested that they had little to no influence over the coastal regions, being centered physically and culturally further inland. Furthermore it is possible that even if there was contact, there would be no oral records from the native peoples of South America, as the contact would be between only fishing villages who were likely without a strong cultural heritage that would have been incorporated later on into the Incan empire, as was the Nazca.¹³ However, the closest tie linguistically between Polynesia and South America is that of the Quechua people, who are native to a region well outside the Nazca. As will be addressed below, there is strong evidence that this small group, outside of the colossal Nazca civilization, encountered Polynesians in some manner and traded with them successfully.

The other human dominated theory is the theory of Polynesian agency. It is well documented that many, if not all of the island nations had strong two-way voyaging cultures, and that their drive to expand and explore was the subject of many oral traditions. Each nation has its own myth surrounding its arrival in the Pacific, and in each of these the daring sailors are key. Thus it is not a small jump to give the Polynesians credit for the introduction of the sweet potato on their own terms. But why then, is there no great mythos for the introduction of the root? Out of all of the cultures of Polynesia, the Māori people alone make note of the importance of the sweet potato and include it in their pantheon. There is no great oral tradition in a land full neither of new crops, nor of contact with a people resembling what one would expect accounts of ancient South Americans to look like. This does not rule out the possibility that Polynesians could have facilitated the spread of the sweet potato all over the Pacific. It is merely noted that there is no oral or historical evidence in most cultures to prove that any great journey ever existed as is often claimed.

Linguistics

The title of this paper is born of two words—cupal and kumara, words representing two very distant names for the same thing. Here is where linguistics proves a fascinating point. In Quechua, one of the languages of Northwestern South America, the word for sweet potato is Cupal or Cumar. In Samoan, it is called ‘Umala, in the Marquesas, Kuma’a, in Hawaiian, Uala, and in Māori of Aotearoa, Kūmara.¹⁴ There is, undeniably, a strong

connection. "Loanwords" as they are called in the study of linguistics, are common throughout the world when cultures encounter something new they lack a name for. Sometimes it is changed, either phonetically or translated directly, or the entire word is taken and adapted to the sounds present in the adopting language. Linguistically, given that the hard "C" sound is the most common in terms used for the sweet potato, it is safe to presume that it is the root, and thus the original version of the word, and the "U" the derivation. This means that, linguistically, Kumal and Kumara, are closer to the original term than Uala. Given that the Māori and Marquesas have the closest sounds to the Quechua, it may be suggested that they had contact with the continent. A Samoan group settled the Marquesas before 500 C.E., and the Māori came from the Cook Islands around the 13th century.¹⁵ In addition, a group from Tahiti settled the Cook Islands in the 6th century.

Where then did this word come from? To a certain extent it is impossible to tell, however, calling again on the strong two way voyaging which existed throughout Polynesia, and understanding that no island was truly divided by the ocean, the most logical assumption is that contact was made, and the crop shared as a valuable new trade good amongst the Polynesians. The first to encounter and cultivate sweet potatoes would, then, be traceable by how close they are linguistically to the source word Cumar or Cumal. This is likely the Māori of Aotearoa and the Cook Islands, who, despite their distance from South America, are undeniably linguistically tied to the continent. It is the Māori alone who venerate and deify the sweet potato, and therefore it is likely that they were present at its introduction.

Mythology

Unlike the taro, a plant with a strong role in numerous creation myths around the Pacific, the sweet potato seems to be more of a foot note—never the star, merely a realm acquired. The only group who has a deity or myth wherein the sweet potato is the Māori of Aotearoa. In the Hawaiian pantheon, the sweet potato, alongside all other staple crops such as breadfruit and taro, is granted to Lono by the god of creation, Kane.

The Māori were among the last to settle in the Pacific, not reaching Aotearoa until around 1250 CE¹⁶, and it is they alone of the Oceanic people who deem sweet potato worthy of a place in their myths. This is their story of how sweet potato came to be.

The god Rongo-Maui stole the kūmara from the god Whānui, the star we know as Vega. He hid the kūmara under his loincloth, and gave it to his wife, Pani. It was Pani who gave birth to the kūmara in the river. In retribution, Whānui sent down Anuhe, Toronū and Moko these are all Māori names for the kūmara moth caterpillar, which attacks and eats the leaves of the sweet potato.) Pani fled from them into the underworld, where she continues to cultivate her kūmara patch.

There are multiple myths surrounding the sweet potato and the one below is from the Māori-maintained website Korero O Nehera, a facet of Maori.org.nz:

Pourangahua left his home one day and travelled to the great land of Hawaiiki. There he visited friends and ate their delicious kumara (sweet potato). He stayed for many months and he was hosted by a great chief named Raukapanga.

When it came time for Pourangahua to return home, he asked Raukapanga if he could borrow two of his huge birds, the toroa that he kept as pets. Raukapanga was reluctant to loan his birds to Pourangahua because he loved them very much, but he eventually agreed. And gave strict instructions on how to care for them.

Pourangahua left on the back of one of the birds carrying two bags of kumara as a gift from the chief. The chief had explained to Pourangahua that once he reached land, he would have to get off the bird and continue his journey on foot. But Pourangahua was lazy and he made the bird fly him all the way home. Because he had to fly so far, the bird was very tired when he went to return home and he was attacked and killed by a huge evil spirit. The other bird made it home safely, with tears rolling down its eyes.

The chief was furious about this when he learned what had happened to his bird and so he sent a plague of caterpillars to destroy the kumara crop that Pourangahua had planted from the kumara the chief had given him as a gift.

The tukutuku panel, Rau Kumara is this story forever immortalized. The toroa today still cries every time it eats.¹⁷

The Māori have a god devoted to the kūmara, who may be the same as Rongo Maui. The Māori were, and still are far more tribal than the rest of Oceania, given how incredibly large Aotearoa is compared to all the other islands of the Pacific. Rongo-Ma-Tane is the god of sweet potatoes and, according to some all root vegetables, as well as the god of peace. In the Māori culture, the importance placed on the cultivation of the sweet potato is a very marked difference from their appreciation of war and fighting prowess. The cultivation of this slow crop during peace times is likely the reason for this association. The Māori always offer the first sweet potato of a harvest to Rongo Maui or Ma-Tane.

Furthermore, Māori have several proverbs associated with sweet potatoes, another unique facet in Oceania: "Kaore te kūmara e kōrero mo tōna māngaro" or "The Kumara does not speak of its own sweetness." Encouraging people to be humble and bear humility well. In addition, "E tupu atu kūmara, e ohu e te anuhe" means

“As the kūmara grows, the caterpillars gather round it”. The Māori liken the sweet potato here to a great chief—good leadership brings followers—in common English parable, if you build it, they will come.

The Māori alone placed such great importance upon the sweet potato. The other, older and longer established peoples of the Pacific have no such place for it in their pantheon. Therefore, let one presume from this information that the sweet potato was introduced to the peoples of Polynesia before the peoples of the Cook Islands, departed for Aotearoa. To them, the sweet potato would have been a vital crop during the long voyage to the Land of the Long White Cloud¹⁸. They settled far later than most of Oceania and by that time the sweet potato had proven its worth alongside such staples as taro and it flourished in the incredibly different climate zones found on the islands of New Zealand. It is important to mention here that there are multiple groups of Māori, each very unique in their voyage to Aotearoa. Therefore there are multiple and contradictory myths that the west can call “Māori” without understanding that they refer to very different groups within the islands of Aotearoa. The judge W.E. Gudgeon, a Māori historian, writes that:

“The Maori tribes, both of the Bay of Plenty and of the East Coast, recognize [sic] that there was a period in their history when that most important article of food, the kumara, was unknown to them. I believe, moreover, that I am justified in saying that this particular tradition is confined to the two districts in question”¹⁹

So while some Māori brought the kumara with them, others had to learn how to cultivate it later, from those who had acquired it earlier.

Personal Theory and Concluding Remarks

While it is unlikely that the sweet potato entered Polynesia and the rest of the Pacific through natural methods alone, it is similarly unlikely that the Polynesians or South Americans would simply set out without a destination to either find or to spread a crop. So let us consider a middle ground between the two.

When it comes to distance voyaging, the Polynesians were at a huge advantage. The canoes they used to explore, which were not the immense double-hulled ships and would carry entire populations and provisions, could cover the distance from Tahiti to Hawaii in approximately a week depending upon the weather and time of year. The peoples of South America at this point had small coastal villages and fishing communities established on coastal islands. What they were likely using were small boats made of totora reeds, of which similar designs are still in use on Lake Titicaca. Interestingly, the design of these reed boats is remarkably similar to those found on Rapa Nui²⁰ (the totora reed was

naturally introduced to Rapa Nui, its lightweight pollen making the journey easily 4000 years before human settlement.²¹) However, they are not designed for the distance voyaging of their Oceanic counterparts.

An attempt at a coldly logical middle ground is posited here. Polynesian navigators used many techniques – they not only used stars and currents, but clouds and birds and most importantly, foliage in the water.²² Anything green in decent condition meant land. Or, alternatively, while the coastal South Americans may not have been adequately prepared for distance voyaging, this does not mean that evidence of their existence could not have ridden the currents south the Tuamotu and Marquesas islands.

Therefore, let one posit this—without giving agency to either the South American or Polynesian peoples alone, it is evident that the sweet potato travelled westward from South America. Given the traditional Polynesian methods of navigation, evidence that they were skilled at reading signs of life in the sea and followed birds, schools of fish, and floating foliage. Taking into account the natural currents, which flow into the areas of the Marquesas and Tuamotu, there is a possibility that the sweet potato foliage naturally, or as a result of coastal fishing village accidents along the Peruvian and Chilean coasts, made the voyage into Polynesian spheres. From there, the voyages were made in pursuit of new lands. Since there are few surviving oral traditions out of that regions native people (due in no small part to Spanish invasion), and just as few mentions of the sweet potato in the histories of Oceanic people outside of Māori Mythos, let one assume that it was through a combination of natural forces and mutual human agency that the sweet potato became a staple of Oceania. Given the strong linguistic tie, which binds the Quechua and their kumara to the Polynesians and their kūmara, contact was likely made at a personal level, not through the stealing of a wild plant.

The linguistic ties between other groups outside of the Quechua is evident too—the groups farther north called their sweet potato kuala, remarkably similar to the Hawaiian u'ala. Whether this is evidence of multiple voyages by different groups to South America or that the Hawaiians traded with groups who had traded with the South Americans is difficult to discern. As such, this paper will refrain from taking either side of that argument.

The introduction of the sweet potato into Oceania was the result of two vibrant, active cultures that shared an ocean. While it is impossible to say who actively sought a relationship, it is evident that one must have existed, however briefly. This small interaction made it possible for the peoples of Oceania to expand and survive, having yet another transportable, highly nutritious staple at their disposal. It was a great tool in their voyaging arsenal, and made possible some of their longest voyages.

Notes:

¹Cumla: The native Quechuan (a people and language group in predating the Inca in South America) word for Sweet Potato. Kūmera: The Maori word for sweet potato, which is still common place in New Zealand English.

²In Roman times, barbarians were often identified by their use of butter instead of olive oil, it was the most apparent identifying factor.

³Barber, Ian G.. *A fast yam to Polynesia: new thinking on the problem of the American sweet potato in Oceania*. S.l.: [s.n.], 2012.

⁴WARDLE, P. 1991. *The Vegetation of New Zealand*. Cambridge, England: Cambridge University Press

⁵The Problem of the Sweet Potato in Polynesia, Roland B. Dixon, *American Anthropologist*, New Series, Vol. 34, No. 1 (Jan. - Mar., 1932), pp. 40

⁶Alvaro Montenegro, *Modeling the prehistoric arrival of the sweet potato in Polynesia*

⁷<http://www.npwrc.usgs.gov/resource/birds/migratio/routes.htm>, USGS Migratory Birds Report

⁸While this was not usually the case for the introduction of the coconut in the Pacific, it is nonetheless a recorded phenomenon.

⁹Hunt, T.L., Lipo, C.P., 2006. Late colonization of Easter Island. *Science* 311, 1603-1606.

¹⁰Alvaro Montenegro, 364

¹¹Ibid

¹²<http://robbwolf.com/2011/04/20growing-sweet-potatoes/>

¹³Thor Heyerdhal, *Kon-Tiki: across the Pacific by raft*. Chicago: Rand McNally, 1950.

¹⁴Michael Moseley. *The Incas and their Ancestors: The Archaeology of Peru*.

¹⁵Translations courtesy of Tiphani Kainoa, and online translation resources.

¹⁶Steven Fisher, *A History of the Pacific Islands*. Pg. 36

¹⁷Howe, K. R.. The quest for origins: who first discovered and settled the Pacific islands?. 179.

¹⁸<http://www.maori.org.nz/korero/default.php?pid=sp68&parent=55>

¹⁹In Maori, Aotearoa means "Land of the Long White Cloud"

²⁰Gudgeon, W.E., *Maori Tradition as to the Kumara*, 99.

²¹Charles B. Heiser. *Totoras, Taxonomy, and Thor*.

²²*Easter Island: Scientific Exploration Into the World's Environmental Problems in Microcosm*. 147

²³Steven Fisher, 35.

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The Oedipus Complex and Écriture Féminine as Seen in Art Spiegelman's *Maus*

Asia Howe
English 300
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Unconfined by a frame, on the last page of *Maus*, an illustration of the Spiegelman family tombstone and the author's signature is printed. While, like the student mentioned in *Teaching Maus to a Holocaust Class*, we may read this illustration as "Vladek's happy ending" (Barr 82), Emily Budick, in *Forced Confessions: The Case of Art Spiegelman's Maus* proposes we read it in terms of psychoanalysis. For Budick, this illustration reads, "what has been repressed and denied beneath consciousness is now consciously acknowledged" (394). Indeed, *Maus* is not necessarily about Vladek's trials and tribulations rather, it is about his son accepting the past. Thus, despite being plagued by Oedipal feelings associated with his mother's death, Art eventually surmounts them by identifying with his father. However, his identification comes about because his father destroyed his mother's diaries, silencing her écriture féminine and allowing his phallogocentric discourse to triumph.

Before proceeding to the argument, an understanding of the Oedipus complex is needed. In *The Ego and the Id*, Freud claims that "[a]t a very early age the little boy develops an object-cathexis for his mother, which is related to the mother's breast and is the prototype for an object-choice" (21). The complex reaches its "peak period" when the boy is between three and five years old, or in the phallic stage. During this period, the complex begins to decline and enter the latency period (Laplanche and Pontalis 254). The complex is only seen again at puberty when the boy's sexual wishes towards his mother become so intense, he perceives his father as an obstacle to his fulfillment of them. Now, due to an inherent bisexuality in children, the complex can manifest itself as "an ambivalent attitude towards his father and an affectionate object-choice towards his mother," and "an affectionate attitude to his father and a corresponding jealousy and hostility towards his mother." The object-choice is given up and complex is repressed upon a father – and mother – identification. The whole phase culminates with "the forming of a precipitate in *The Ego*, consisting of these two identifications" which then "confronts the other contents of *The Ego* as an ego-ideal or super-ego" (*The Ego* 22-24).

In *Maus*, because of the trauma inflicted by Anja's death, Art is plagued by remnants of his once-repressed Oedipus complex. As repression does not mean eradication, Oedipal feelings that seem to have been overcome can resurface upon the death of a parent or a similar traumatic experience (de Berg 80). Freud defined preconditions, which allow the

repressed to return: "the weakening of the anticathexis, the reinforcement of the instinctual pressure, and the occurrence in the present, of events which call forth the repressed material" (Laplanche and Pontalis 356). As such, it may be assumed that the first two preconditions occurred in Art's psychical apparatus, for Anja's death, which occurred in the present, managed to call forth repressed material; specifically, that of Art having her as an object-choice. This claim is supported by the fact that Art becomes excited when Vladek tells him about Anja's diaries and that Art continually asks about them throughout most of *Maus*. Art would not behave as such if he were not in need of his mother. However, he does not only desire his mother, but wants to identify with her as well.

Before Freud contemplated an inherent bisexuality in children, he believed the boy's object-cathexis could be fulfilled by, "either an identification with his mother or an intensification of his identification with his father" (*The Ego* 22). In other words, he believed the boy did not need both a father- and mother-identification. While Freud considered the latter to be more normal, for it allowed the boy to retain his affectionate relation to his mother (*The Ego* 22), Art, at least at the start of *Maus*, is trying to identify with his mother through his desire of her diaries. He is trying to do so because intensifying his identification with Vladek will not allow him to retain his affectionate relation to Anja. Since she is no longer physically present, identifying with his father will be fruitless. Moreover, Vladek is not one to reminisce about her, as is clear in Appendix A. So that even if Art intensified his identification with his father, he would not have a channel through which he could retain his affectionate relation to Anja. If Vladek did reminisce about his mother, Art would be able to live vicariously through him, and subsequently retain his affectionate relation. Thus, Art both desires and wants to identify with his mother.

However, because Art should not be experiencing these Oedipal feelings, they plague him. Being "over 30 years old" (Spiegelman 71), he is past the age when he should desire and want to identify with his mother. Furthermore, his display of reaction formation in his relationship with Françoise should not occur concurrently with an object-choice of his mother. Indeed, reaction formation is important here, as it is a defense mechanism displayed by men who have overcome their Oedipus complexes. Freud touches upon it in *On the Universal Tendency to Debasement in the Sphere of Love* when he states that "the strange failure shown in psychical impotence makes its appearance whenever an object which has been chosen with the aim of avoiding incest recalls the prohibited object through some feature, often an inconspicuous one" (150). In other words, men who have learned about the immorality of incest and as such have surmounted their Oedipus complexes do not desire objects, which remind them of their mothers, sisters, etc. That Art is with an object who

is the opposite of the women he describes in Appendix B, who "remind [him] too much of [his] relatives to be erotic" (Spiegelman 172), implies he understands the immorality of incest. Yet, that he displays his desire of his mother at the same time, like he does in Appendix C, in his need of her diaries, shows he has been afflicted with feelings he cannot control and which he probably would not choose to feel.

Of course, it is because Art perceives the diaries as the embodiment of Anja, that he is able to direct his object-cathexis of his mother towards them. Although they are not the only possessions Anja left behind, as Vladek makes clear when he says he destroyed the diaries "and other nice things of mother" (160), the diaries are the only things, which tell her "whole story from the start" (Spiegelman 86), undoubtedly in her voice. As such, they would have provided Anja with a presence in the world of the living had Vladek not destroyed them. However, before Art learns of their destruction, the diaries appeal to his object-cathexis of his mother for this very reason. Art's attitude towards Vladek is like that of an adolescent boy in the midst of his Oedipus complex, ambivalent, as seen in Appendix D, shows he must perceive his father as an obstacle. Which, because of the "psychologically slanted" (Budick 391) nature of *Maus*, Vladek is literally portrayed as being. As is seen in Appendix E, whenever Art asks about the diaries, his father always avoids producing the diaries and as such, is an obstacle to Art being and identifying with his mother. Furthermore, that he calls his father a murderer twice after he learns the diaries have been destroyed (Spiegelman 161), testifies to the fact he perceives the diaries as the embodiment of Anja. Indeed, his calling Vladek a murderer for destroying inanimate objects does not make sense, unless the diaries are perceived as a body.

In effect, the destruction of the diaries is representative of the castration complex. A complex, which occurs during the Oedipus, the castration develops when the boy discovers the anatomical distinction between the sexes, and attributes the difference "to the fact of the girl's penis having been cut off" (Laplanche and Pontalis 59-60). Thus, he begins to fear being castrated himself, specifically, "the carrying out of a paternal threat made in reply to his sexual activities" (Laplanche and Pontalis 59-60). In other words, he begins to fear being castrated by his father, who he perceives as a "castrating agent," for having sexual wishes in regard to his mother (Laplanche and Pontalis 59-60). This logic comes about as, "the influence of authority, religious teaching, schooling and reading" from which the boy learns that having such sexual wishes is wrong (*The Ego* 24). As such, the castration complex "marks the terminal crisis of the Oedipus complex in that it has the effect of placing a prohibition upon the child's maternal object" (Laplanche and Pontalis 60). The castration does so because the boy comes to understand that he cannot have sexual wishes in regard to his mother and as

such, cannot pursue his Oedipal feelings. Thus, after the castration complex, the father- and mother-identification occurs, and the superego is formed (*The Ego* 24).

Indeed, the scenes in which Art learns about the destruction of the diaries is representative of the castration complex, for in them Vladek becomes the influence of authority, and Art becomes the boy who has a prohibition placed on his maternal object. By telling Art the diaries do not exist, as he does in Appendix F, Vladek becomes the authority figure from whom Art learns he cannot desire his mother. Moreover, that Vladek cannot remember what Anja wrote, despite having "looked in" the diaries and knowing Anja meant for Art to inherit her story (Spiegelman 161), further shows he is an authority figure. Through his silence, Vladek reveals his refusal to act as a bridge between Art and Anja, as well as his need for Art to stop desiring Anja. Thus, Art becomes the boy who has a prohibition placed on his maternal object, for he comes to understand, from the influence of authority, that he cannot desire his mother.

What further support the fact that the castration complex is represented by the scenes in which Art learns about the destruction of the diaries is his subsequent identification with Vladek. Indeed, in the castration complex, "[t]he father is experienced as the source of all authority... and thus capable of castrating the boy-child" (*The Ego* 14). However, the boy manages to overcome this fear of his father and abandon his love of his mother by identifying with his father, with the understanding that by doing so, he will be able to occupy such a position of power in time (Wright 14). Art identifies with Vladek through the interview process, and subsequently abandons his need of Anja, specifically through the use of postmemory. The frame in Appendix G testifies to his use of postmemory, or his adopting of Vladek's experiences as his own, for in the frame "flies that infest the corpses of the Auschwitz camp buzz around Artie and the smoke of his omnipresent cigarette blends with that from the crematoriums' chimneys" (Dragulescu 142). True, Art mentions his mother in the frame and continues to ask about her until the end of *Maus*. However, only after he learns about the destruction of the diaries do "[t]he bodies of four Jewish girls, whom Vladek recalls were 'good friends of Anja's' hanged in the Nazi-occupied Poland, materialize dangling from trees in the Catskills as Artie drives his wife and his father to the supermarket in the late 70s" (Dragulescu 142). In other words, only after Art learns about the destruction of the diaries are indicators of postmemory seen, signaling his identification with his father.

Furthermore, that Art portrays Anja as being led back to his father, and Vladek as calling her 'my Anja' in Appendix H, shows Art has abandoned his need of her and surmounted his Oedipal feelings. While the Oedipus complex is culminated with the forming of the superego in *The Ego*, in order to repress the complex (*The Ego* 24), Art cannot be said to have formed a superego. As he experienced the Oedipus complex in

childhood and adolescence, he has already formed one and repressed the complex. Instead, Art can be said to have surmounted his Oedipal feelings by way of his ego, which is “attributed the function of instigating repression” (*The Ego* 25). In other words, Art repressed his Oedipal feelings not through his superego, for he did not need to master the complex, but through his ego, because he needed to master feelings associated with it. Now, in Appendix H, which is seen at the end of *Maus*, Art portrays Anja as being led back to his father and his father as calling her ‘my Anja.’ His decision to portray his parents as such suggests Anja had been lost, or kept from his father by his need of her, but that Art has come to understand his mother belongs to his father. In other words, through the frames, Art shows he has abandoned his need of Anja and repressed his Oedipal feelings.

However, Art is only able to identify with Vladek and surmount his Oedipal feelings because his father destroyed Anja’s diaries, silencing her *écriture féminine* and allowing his phallogocentric discourse to triumph. Hélène Cixous claims writing for women is “[a]n act that will [sic] be marked by women’s *seizing* the occasion to *speak*, hence her shattering entry into history, which has always been based *on her suppression* (420 author’s emphasis). Although Anja seized the occasion to speak by writing diaries, she failed to have a shattering entry into the Spiegelman’s Holocaust history. Instead, her entry into Spiegelman’s Holocaust history is based on her suppression; that is, she only appears in *Maus* through Vladek’s discourse because her own voice has been silenced. Indeed, by destroying her diaries and subsequently silencing her *écriture féminine*, Vladek allowed his phallogocentric discourse to triumph, as his is the only discourse Art hears. His discourse is no doubt phallogocentric, as discourse is marked, or different for males and females, and “run by a libidinal and cultural — hence political, typically masculine — economy” (Cixous 418). As such, Vladek, being male and having learned to privilege the masculine, does the very thing Cixous condemned men of doing: he turns Anja into “the uncanny stranger on display” (419). In other words, through his phallogocentric discourse, he portrays Anja in ways which she herself would not, ways which privilege the masculine. Moreover, by allowing only his discourse to be heard, Vladek denies Art the chance to achieve a full father- and mother-identification, as Freud believed should occur. For, even when Art is told stories about Anja through which he can identify with her, such as the one about her friends who hanged near Vladek’s workshop (Spiegelman 239), the stories are from his father’s perspective.

In the end, most of what comprises this interpretation, and more, is reflected in the *mise en abyme* that is *Prisoner on the Hell Planet*. This is because, as a *mise en abyme*, the narrative clarifies the story in which it is set (Moshe 419). The trauma inflicted by Anja’s death, for instance, is seen in *Prisoner on the Hell Planet* when Art says to her, “You put me...shortened

all my circuits...cut my nerve endings...and crossed my wires!” (Spiegelman 105) Yet, the narrative is not a mirror image of the events in *Maus*, as “the events that go into the *mise en abyme* of the story, if any, will not be literally the same as those which will bring the story to a close” (Moshe 434). *Prisoner on the Hell Planet* closes with Art isolated from society, having been put in prison, because he cannot process the trauma inflicted by Anja’s death. *Maus*, on the other hand, closes with what was impossible in the *mise en abyme*: Art comes to terms with the past in that, he surmounts the Oedipal feelings associated with the trauma inflicted by his mother’s death and identifies with his father; and in this way, rejoins society.

Appendix A



(Spiegelman 160)

Appendix B



(Spiegelman 172)

Appendix C



(Spiegelman 86)

Appendix D



(Spiegelman 99-100)

Appendix E



(Spiegelman 86)



(Spiegelman 107)



(Spiegelman 160)

Appendix F



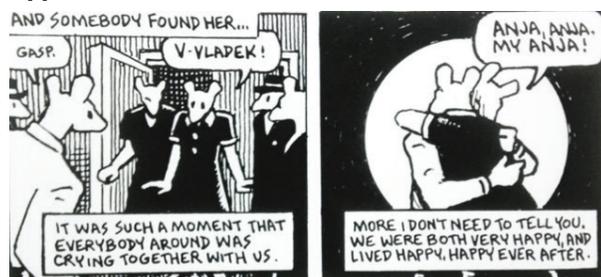
(Spiegelman 160)

Appendix G



(Spiegelman 201)

Appendix H



(Spiegelman 296)

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Banana Foliage and Rejected Banana Fruits as Feed for Livestock in Hawai'i

Kuilei Kramer
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Abstract

Different varieties of *Musa spp.* typically exhibit the same relative amounts of nutrient compositions. Banana fruits are known to provide additional amounts of energy from the presence of starch (Ibrahim et al., 2000), but are low in crude fiber, protein and mineral content (Chedly and Lee, 2000). Although low in protein and minerals as well, the leaves, sheaths and pseudo-stems are very high in fiber. Biological compounds, such as tannins, flavonoids and terpenoids found in banana foliage are natural combatants against internal parasites (Marie-Magdeleine et al., 2010). Supplementation for proteins and minerals are generally needed if banana is utilized as feed. Plantations in Hawai'i are usually open in selling rejected fruits and foliage to those willing to buy and transport the materials (Hamakua Springs Country Farms, 2013; Hana Farms, 2013).

Introduction

The state of Hawai'i has a dependence on importing cargo ships full of food and supplies in order to further support the local population. This not only increases the prices of imported goods, but also has an impact on how citizens dispose of waste products. Hence, the implications of self-sustainability and use of waste by-products need to be considered. Livestock production industries in Hawai'i do periodically purchase forages and concentrates from overseas to satisfy the needs of the animals. However, there are possible local alternative crops that have the potential of being utilized as a feed component.

Varieties of banana fruits and foliage are blended into livestock feeds in many tropical regions, especially those in Africa and Central America where other resources are limited. Hawai'i remains one of the most significant commercial producers in the United States with at least 200 banana plantations reported each year (U.S. Department of Agriculture, 2012). Fruits that failed to go to market and leftover organic material have been used to provide starch for energy (Ibrahim et al., 2000) and as a supplemental component in low quality forages.

Nutritional analyses are still being conducted in incorporating banana by-products in various combinations of feedstuffs. Scientific journals have reported observed chemical compositions, digestibility, and influences on feed intake, growth and even actions against parasitic life cycles. Comparing the results from multiple experiments can aid in narrowing down the

overall nutritional and economic value of providing banana by-products as a feed to different species of ruminants and non-ruminants.

Source

Multiple varieties of bananas are cultivated within tropical regions of the world such as the Caribbean, Central and South America, South East Asia, and Polynesia. Although commonly referred to as a tree by its appearance, it is actually a giant perennial herb due to the lack of woody structural components (Vezina et al., 2013). Its lifecycle is relatively short compared to most tree or tree-like plants; it ultimately comes to an end after bearing fruit. The leaves and pseudo-stems that remain are commonly composted and eventually returned back into the soil as natural fertilizers.

Availability

The U.S. Department of Agriculture (2012) displayed statistical data regarding banana plantations in the state of Hawai'i. Values were reported in acreage and pounds, which were converted to metric units, hectares, and kilograms, and then rounded for simplicity. During 2011 approximately 240 farms participated in banana production, where an averaged total of 530 hectares were planted with trees. Only 400 hectares were harvested with an average yield of 19,500 kg per hectare, totaling to 7.89 million kg (2% less than 2010). Therefore about 1.58 million kg of waste crop were rejected from going into market (U.S. Department of Agriculture, 2012).

Subsequent to harvesting on banana plantations, the waste products are typically composted and returned back into the soil for natural fertilization. Most of the fruits are shipped to local markets, however, a portion of those rejected are also sold but set at an off-grade quality (Hamakua Springs Country Farms, 2013). Residents or businesses looking into purchasing banana waste products are welcomed to do so. Plantations, such as Hamakua Springs Country Farms and 'Ohana Banana Farm Inc. on the Big Island and Hana Farms on Maui, sell to those willing to buy. The only requirement in purchasing banana waste products is for the customers to provide their own transportation for the by-products, due to the massive weight of the banana trees.

Nutrient Content

Five different scholarly journal articles were used in correlating a relationship between the reported chemical compositions of each particular species of banana. Dung et al. (2002) involved digestive trials using sheaths of *Musa paradisiaca* (plantains) conducted on 18 growing Yorkshire pigs. All animals weighed between 45 and 50 kg live weight (LW) and were dewormed and vaccinated before start of the experiment and individually housed in metabolism cages. The formulated banana sheath diet was given for a 14-day adaptation period and then a 4-day fecal collection period followed. The nutrient compositions are reported in Table 1.

Archimede et al. (2009) held a growth trial and digestion trial on the effects of green *M. paradisiaca* fruits on 40 6-month-old Martinik lambs (29.4 kg \pm 3.6 kg body weight) and 4 Martinik rams (57.2 kg \pm 3.45 kg BW) respectively. All were housed in metabolism crates individually during both trials with ruminal and duodenal cannulae fittings in the digestion trial. Each trial was held a total of 85 days –14 days for adaptation and 71 days of data collection. The chemical compositions are reported in Table 1.

Marie-Magdeleine et al. (2010) studied feeding banana foliage (leaves and pseudo-stems) of *M. paradisiaca* in a blended diet of *Dichantium* hay and commercial pellets at various proportions. Besides analyzing the effects of the foliage on growth and nutrition, there also included research on actions against an internal parasite, *Haemonchus contortus* (Barber Pole Worm). Forty-five-month-old Martinik lambs (17.3 kg \pm 4.1 kg BW) were used in both trial 1 and 2. Each trial followed the same standard feeding procedures: a 21-day adaptation period and then 35 days of collection. Within each trial there were a control group and experimental group where the experimental was infected with a fixed number of *H. contortus* eggs after adaptation and the other remained uninfected. The combined nutrient composition of the leaves and pseudo-stems can be found in Table 1.

Table 1
Nutrient composition of *M. paradisiaca* plant parts

Plant part	DM (%)	OM (g kg ⁻¹ DM)	CP	EE	NDF	ADF	ADL	HC	Ce	Ash
Sheath	NS ^b	836	26	59	567	427	72	140	355	164
Green fruit	18.0	944	53	NS	283	55	22	233	33	NS
Leaf and pseudo-stem	101.0 ^c	852	104	NS	680	450	122	NS	NS	NS

^a DM: dry matter; OM: organic matter; CP: crude protein; EE: ether extract; NDF: neutral detergent fiber; ADF: acid detergent fiber; ADL: acid detergent lignin; HC: hemicellulose; Ce: cellulose.

^b NS: not stated or not determined in experiment.

^c Dry matter in terms of g kg⁻¹.

Another species of banana was studied, *M. acuminata*, on 12 4 to 6-month-old goats (15.8 kg \pm 2.1 kg BW) using only the leaves and pseudo-stem sheaths (Katongole et al., 2007). All animals were vaccinated for Foot-and-Mouth Disease and intestinal parasites and then housed in metabolism cages. The experiment encompassed 15 days total with 10 days for adaptation and 5 days for data collection. The nutrient composition for this species is shown in Table 2.

Table 2
Nutrient composition of *M. acuminata* plant parts

Plant part	DM ^a (g kg ⁻¹)	CP (g DM)	EE (kg ⁻¹)	NDF	ADF	Lignin	Ash	Energy ^c
Leaf	216	109	23	613	349	124	108	6.3
Sheath	97	34	NS	659	355	102	128	NS

^a For abbreviations, refer to Table 1.

^c Reported as MJ kg⁻¹ DM.

Rejected green fruits of *M. AAA* were given *ad libitum* in addition to pasture grasses (Ibrahim et al., 2000). Thirty-two 10 to 12-month-old steers (220-240 kg LW) were subjected to several combinations of pasture grasses, banana fruits, and protein supplements that ran for approximately 5 months. Analysis of the banana fruits was via the *in vitro* dry matter digestibility test (IVDMD). This technique replicates the digestive actions of the rumen. Ground-up feed samples are incubated in fluid that mirrors fluid inside the rumen for 24 to 48 hours. The addition of acid and pepsin follows with a final 24-hour period of incubation to determine the digestibility of the feed. Since the study's main objective was to determine digestibility, all classes except crude protein were excluded from the proximate analysis. Data also shows the values of crude protein on high rainfall and low rainfall levels in a humid tropical climate, in order to see if there was a significant relationship. Crude protein values under high and low rainfalls are shown in Table 3.

Table 3
Nutrient composition of *Musa AAA* fruit

Plant Part	CP (g kg ⁻¹ DM) ^d	
	HR ^f	LR
Green fruit	47	46

^d For abbreviations, refer to Table 1.

^f HR: high rainfall; LR: low rainfall.

Utilization for Livestock

Banana sheaths from *M. paradisiaca* were revealed to contain very low CP levels (26 g kg⁻¹ DM) and a high NDF content (567 g kg⁻¹ DM) with a 0.39 ratio of hemicellulose to cellulose (Dung et al., 2002). Regardless of the species of livestock being fed, the banana sheaths alone must be accompanied by an

appropriate source of dietary protein. Banana foliage is known to possess secondary biological compounds such as tannins. Tannin compounds can demonstrate negative effects on digestibility by forming large and chemically stable complexes with protein and cellulose. The size of these molecules inhibits microbial fermentation and also prevents absorption of proteins and cellulose through the intestinal mucosa (McLeod, 1974).

Green *Musa paradisiaca* fruits remained proportionally similar to the nutrient composition of banana sheaths. Crude protein content was slightly higher than in sheaths (53 g kg⁻¹ DM) and NDF levels were approximately halved (283 g kg⁻¹ DM) where hemicellulose is about 7 times more than that of cellulose (Archimede et al., 2009). Digestibility of the starch in the fruit was slightly greater than 90% where the rate of degradation inside the rumen is considered slow. In this study there was no analysis on the starch content. Nonetheless it can be determined that its total tract digestibility will not be affected from negative influences of high fiber concentrations (particularly from *Gliricidia sepium* forage used in this study) (Archimede et al., 2009).

Nutrient composition of *Musa paradisiaca*, Marie-Magdeleine et al. (2010) indicated the presence of biological compounds – polyphenols and condensed tannins. Banana trees primarily contain phenolic compounds where tannins make up a fraction of the polyphenols available. Compared to other studies, the banana foliage comprised of significantly low levels of condensed tannins; most of these tannins typically reside more in the leaves versus the pseudo-stems.

The effects of *H. contortus* confirmation still require further experimentation. The results of trial 1 on the establishment *H. contortus* are still left for debate due to the presence of lurking variables and bias. Low quality forages were used alongside with banana foliage in this trial. Digestibility of crude protein in the forages was significantly lower than in banana, which creates a potential bias, and therefore, trial 1 could not be justified. However the development of immunity to parasitic nematodes can be determined by the amount of dietary protein.

Trial 2 on the other hand did show some promising effects on fully mature *H. contortus*. The observed numbers of eggs found in feces were lower than that of trial 1 with the number of adult female worms remained relatively the same. Consequently, actions of banana foliage could have reduced the fertility rates of adult females. Trial 2 also exhibited a distinct reduction in the development of larvae from eggs. Further chemical analyses on banana foliage discovered more biological compounds – terpenoids and flavonoids, which were determined to play several roles against *H. contortus* (Ademola et al., 2005).

M. acuminata is very similar to its respective plant parts of the *M. paradisiaca*. The leaves, fresh or withered, had a CP content of 109 g kg⁻¹ DM, which is within range of *M. paradisiaca*. NDF and lignin components are high in concentration and both have been indicated to decrease dry matter digestibility by limiting microbial digestion in the rumen. Like in any banana foliage tannins were found and of course, have been well known to decrease digestibility of feed. Sheaths possess the same properties as the leaves, but have a significantly higher digestibility due to smaller lignin content. The reason for this observation is from the cellular structure of the sheaths and pseudo-stems where much of the lignin is replaced by water in the cell wall to maintain vertical support of the plant (Katongole et al., 2007).

Ibrahim et al. (2000) involved two different banana fruit combinations tested on steers: pasture with banana and pasture with banana and *Erythrina berteroana* (tropical legume in Central America). LW gains per steer were reported to be highest when green banana fruits were incorporated into the diet. This is due to the high-energy value provided by banana from its starch content. Feedstuffs with high starch levels have a large proportion of bypass energy to the intestines, a possible explanation to the LW gains. However since this particular experiment was carried out in Central America where forages tend to be of lower quality, animals given supplemental energy feeds will gain significantly more weight than the norm.

Economic Value

The average farm price per kilogram of fruit was reported to be \$1.43 kg⁻¹. Hence the crops that failed to be harvested resulted in a lost profit of \$2.26 million (U.S. Department of Agriculture, 2012). Looking at the past ten years from 2011, it can be projected that farm prices will continue to gradually increase (until reaching economic equilibrium) each coming year. Purchasing fresh banana fruits, either retail or directly from the plantation, may or may not be reasonable depending on the profitability of the livestock industry itself. If that is the case, then obtaining those that were rejected would be the better solution. Depending on the farm specifically, most of the rejected fruits are sold off-grade where very little is actually returned to the soil (Hamakua Springs Country Farms, 2013).

Since all the trees and foliage are to be composted after harvesting season, many banana plantations are willing to sell to non-retail customers. The available tannins, flavonoids and terpenoids, provide internal parasitic resistance (Marie-Magdeleine et al., 2010; Ademola et al., 2005) and the high fiber content makes foliage a useful source of roughage that can be ensiled or given as-fed. If provided a hauling vehicle for transportation, utilizing these waste products will benefit livestock health and offer more uses than composting material.

Conclusion

Banana cultivation farms are widely spread throughout tropical and sub-tropical regions. Being that Hawai'i is one of the top banana producers in the United States, over 200 farms produce millions of kilograms of banana fruits alone. Approximately 1.5 million kg of fruits were rejected in 2011 (U.S. Department of Agriculture, 2012) and even more in the weight of foliage left over from harvesting. Any organic material that is not sent to market is converted into compost, making banana a cost-effective ingredient source for livestock feed. Rejected fruits, green, immature or ripe, provide additional energy for animals from the available starch (Ibrahim et al., 2000), but are low in crude fiber, crude protein, and minerals. In conjunction with the fruits, forages such as grasses, and protein and mineral supplements are recommended (Chedly and Lee, 2000). Ensiled or as-fed banana leaves and pseudo-stems can be used as roughage sources due to the high fiber content (Dung et al., 2002; Katongole et al., 2007). Again since they are low in protein and minerals, appropriate supplementation is needed. Presence of tannins, flavonoids and terpenoids enhance resistance to internal parasites (Marie-Magdeleine et al., 2010; Ademola et al., 2005). Incorporation of banana fruits and foliage can greatly benefit livestock and livestock industries in Hawai'i, as well as, simultaneously reducing expenses on purchasing and shipping off-island feedstuffs.

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Ingestive Behavior in Swine

*Kuilei Kramer
Animal Science 175
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Abstract

Pre-weaned piglets listen to the cues from their dam to know when it is time to gather and when it is time to suckle. Interruptions within phases of the nursing cycle can lead to negative correlations in milk consumption and production. Natural weaning is a slow and gradual process that causes the least amount of discomfort and abnormal feeding behaviors in piglets compared to abrupt separation. Artificial weaning at young ages psychologically stresses piglets, which results in fasting periods and reduced initial intakes of feed and water. Designs in feeders and water dispensers must accommodate efficient accessibility for each animal, maintain sanitation, minimize wasted resources, and allow pigs to ingest water using natural sucking motor functions. Swine have preferences for feed that come in certain physical forms and formulations that with high palatability and physiochemical properties, such as fiber, can satisfy hunger in pigs fed on restricted diets.

Introduction

Swine are omnivorous creatures and when reared in free-ranging environments, exhibit relatively defined cyclic patterns early in life. Subsequent to birth, piglets become settled in the nest that the sow has constructed and remain there for approximately 10 days, in which they will rejoin the mother's group of females (Jensen et al., 1993). Suckling milk from the dam is a highly complex sequence of physical activity and vocal commands from sow to offspring. Within the first few days of life, piglets establish their own rankings in the litter, which generally determines the individual's rate of survivability.

Natural weaning is a gradual process that involves piglets starting to become familiarized in rooting and grazing within the first few weeks of life. Complete weaning occurs typically after 7 weeks of age. Commercial weaning, on the other hand, is usually abrupt and can be as early as 2 to 3 weeks of age, with the majority of operations weaning at 3 to 4 weeks (Widowski et al., 2007). Young piglets forcibly separated from the dam tend to fast for varying lengths of time and develop other abnormal behaviors, such as belly nosing. Creep feeding has been observed to cushion some of the impacts from physical and psychological stress, but is not yet fully defined, as similar consequences are still being explored (Souza and Zanella, 2007).

Confined swine operations also influence ingestive behaviors of growing pigs, sows and boars. Poorly designed feeders and water dispensers can affect overall performances due to lack of accommodation in feed palatability or accessibility, and muscular motor

motions for drinking water. Even established social hierarchies and disruptive noises can induce certain feeding behaviors to pigs of all ages.

Pre-Weaned Piglets

Within minutes of birth, the piglets are already beginning to establish their place called a "teat order". Although the sow normally has teats for each of her offspring, some teats offer more milk, whereas others provide milk of higher quality. Piglets fight over teats that can last anywhere from a few hours to up to 10 days, where those with higher birth weights normally succeed (De Passille and Rushen, 1989).

Once the entire teat order has been established, a nursing cycle subsequently begins with 5 defined phases. In Phase 1, the sow grunts for up to a minute in duration, signaling her litter that it is time to gather and nurse (Bels, 2006). The piglets then massage the udder in Phase 2, which activates the oxytocin hormone to secrete and initiate the flow of milk to the teat. Phase 3 involves slightly rapid grunts from the sow with 20 to 30 second durations that tell the piglets to begin suckling slowly. Once milk flows through and out of the teat, piglets suckle at a much faster pace for about 10 to 20 seconds in Phase 4. Lastly, in Phase 5, the massaging of the udder commences again for a few seconds to up to ten minutes where piglets will then restart the suckling cycle (Jensen, 1988).

Milk intake is internally regulated by how satisfied offsprings are with the amount consumed. Gastric loading involves the stomach being filled up to the point where the animal no longer has feeding motivation (i.e. hunger). Hormones that are secreted due to gastric loading, such as peptide hormone cholecystokinin (CCK), send messages to the brain in regard to the level of satiety. CCK in particular has been seen in piglets as young as 2 days old (Baranyiova and Hullinger, 1999). However, piglets still participate in suckling motor behaviors even after hunger has subsided (Fry et al., 1981).

Possible disturbances within the nursing phases can come from loud or unnatural noise sources, such as from mechanical appliances in confinement operations. Disruptive sounds can distract the sow or inhibit the pigs from hearing her. Grunts from the dam are important in signaling the time for transitioning into the next phase in the cycle. Without these signals, the sow and piglets can succumb to decreased milk production and ingestion respectively (Algers and Jensen, 1991).

Features in the sow's life can potentially affect the ingestive intake or behavior of her offspring. As a gilt her birth litter size, season of birth, weaning age and age of first insemination may improve or depress various functions of the piglets. A relationship was examined between feed intake and the size of the sow's birth litter in Sell-Kubiak et al. (2011). If there were extra piglets in the birth litter (i.e. more piglets than the average for the breed), her litter's feed intake as grow-finish pigs

would decrease 4 grams per day. However there are many more aspects either from the sow's life history or the environment that can influence feeding behaviors of piglets.

Newly Weaned Piglets and Growing Pigs

Large commercial weaning ages are much younger than in wild or free-ranged pigs. Majority of operations start at 3 to 4 weeks, but some may go as early as 2 weeks. Early weaning such as this usually results in piglets fasting for various lengths of time. Some may eat feed within 5 hours after weaning, whereas others may eat after 50 hours (Bruininx et al., 2002). Creep feeding does allow piglets to become accustomed to solid feed consumption and can slightly increase intake and weight gain during the early post-weaning period (Bruininx et al., 2002).

Limited access to feeds can be induced from the number of pigs per trough. Larger pig-to-trough ratios have been reported to reduce meal frequencies (number of meals per day) in some animals, but can sometimes increase the size of each meal consumed simultaneously (Bels, 2006). Design of the feeders has also shown similar results; less meal frequencies were observed from difficulties in gaining access to the feeder and higher meal frequencies from difficulties to retain feeding activity. Location of the water source may also increase feeding motivation of pigs if placed near the feeder, thereby increasing the overall meal frequency (Bels, 2006).

Torrey et al. (2008) experimented with 3 different designs of water sources on newly weaned piglets to determine relationships with water intake, water waste, and relationships to belly nosing. The Drink-O-Mat push-lever bowl drinker (PUSH) allows piglets to use their snouts to apply pressure against a water valve. Individuals can then ingest water via sucking motor motion that is also seen when suckling milk during nursing. Aquadish float bowl drinkers (FLOAT) do not have a pressure valve for snouts like PUSH, but still allows piglets to utilize their sucking behavior to drink. Lastly, nipple drinkers (NIPPLE) dispense water directly into the mouth once activated when pigs bite down on the depressed valve.

Observed water consumption increased with the age of the pigs from NIPPLE and PUSH devices. This also increased feed intake over time, as well (Fowler and Gill, 1989; McLeese et al., 1992; Maenz et al., 1994; Torrey et al., 2008). FLOAT, on the other hand, had far less water consumption overall, especially 2 days after weaning. This is due to FLOAT's poor design where water became tainted with urine, feces, and feed shortly after piglets were introduced. Water that was wasted was greater in NIPPLE devices due to less than half of the water used was actually ingested (Torrey et al., 2008). Without the use of sucking motor patterns, more water was spilled out of the mouth. Faster flow rates of water through the valve also contributed to a

higher percentage of spillage. In the case of belly nosing behaviors, PUSH exhibited less events compared to NIPPLE and FLOAT in piglets weaned at 15 days of age due to tactile snout stimulations from the pressure valve (Torrey and Widowski, 2004).

Different forms of feed determine the degree of palatability, which will then determine how much feed is eaten. The feeding rates (grams per minute) in liquid, pelleted and dry meal diets are in order from highest to lowest respectively (Laitat et al., 1999). Liquid diets allow newly weaned and growing pigs to utilize their natural sucking motor motions compared to pellets and dry meal. The mixture of water and feed also reduces interruptions from feeding to drinking and vice versa – improving amount ingested.

Adult Pigs

Within the social hierarchy, confined pigs reared in groups in semi-natural environments with only one feed trough available generally eat less meals per day, but with higher meal sizes (Bornett et al., 2000). When in groups, pigs prefer to eat with other adjacent pigs because they place a higher value on available feeds with a companion than when in solitude (Pedersen et al., 2002), and tend to eat specific feed formulations when observing what other pigs are ingesting (Morgan et al., 2003). Feed intakes in those reared individually observed the opposite, where meal frequencies are higher and meal sizes lower (Bels, 2006).

Effects on dominance in the hierarchy are not fully defined, as there are some variations in observed feeding behaviors. Hoy et al. (2012) reported dominant boars visiting feeding stations frequently and spending shorter times eating, which lowered feed intakes. Subdominant boars did not visit as frequently, but spent more time feeding. Bels (2006) also reported these findings with barrows showing similar feeding behaviors as subdominant boars. As for aggression sows and boars in group housings exhibit competitions over feed sources, which can especially be seen more prevalent among high-ranking sows (Csermely and Wood-Gush, 1986).

In regards to feeding motivation, the vast majority of swine operations supply restricted amounts of feed for pigs based on their stage of maturity and body condition. Pregnant gilts are generally fed to only meet their body's maintenance and growth needs – approximately 2 kilograms of feed per day. Sows and sexually active boars are usually given about 60% of their *ad libitum* intake amount to satisfy maintenance needs, which may increase the chances of feeding motivation (Bels, 2006).

Purchasing feed is one of the major expenses in any livestock industry. Therefore decreasing feeding motivation can greatly aid in saving money and also improve the welfare of restricted-fed animals. Dietary fibers are well-known to increase satiety in both humans and swine due to certain physiochemical properties. Bulky (water-binding capacity) fibers increase chewing,

saliva production and increases gastric distension from expansion in volume of the stomach, bringing feelings of satiety (Souza da Silva et al., 2012). Viscous fibers and fibers with high fermentability are able to influence digestive activities in the GI tract and increase chewing and saliva production like bulky fibers. Hypotheses of the property of viscosity include delaying gastric emptying of ingesta from stomach to intestine by trapping nutrients in the matrix, thereby slowing down the exiting process and allowing more time for enzymatic digestion (Brownlee, 2011).

Souza da Silva et al. (2012) studied these 3 different physiochemical properties of fibrous diets using lignocellulose (LC) for bulkiness, highly methylated citrus pectin (PEC) for viscosity, and fermentability as resistant starch (RS). LC was confirmed to reduce feeding motivation by at least 1 to 3 hours after a meal, with others reduced by 7 hours regardless of low or high inclusion levels of LC in the diet (Souza da Silva et al., 2012). PEC did not confirm the typical observations of viscous fibers. Increase in hunger increased further with additional inclusions of PEC in the diet, and also resulted in pigs spending more time at feeding stations.

Analogous studies in humans using viscous fibers indicated higher satiety in liquid form than in solid, which was used in Wanders et al. (2011). As a liquid, the fiber is completely hydrated and provides a different appeal that can be palatable to more animals (Kristensen et al., 2011). In RS overall feeding motivation and time spent at feeding stations were reduced throughout relative feeding times. Starch in RS broken down in the GI tract provides additional energy sources, is able to stabilize blood glucose and insulin levels, and can stimulate satiety hormone secretions (Delzenne and Cani, 2005).

Conclusion

Even within minutes after birth, piglets immediately begin utilizing their instinctive feeding motor skills. Throughout life until reaching maturity, pigs will continue to develop ingestive behaviors that can be easily influenced based on genetic backgrounds, surrounding environment, and status within a social hierarchy. Pre-weaned piglets listen to the cues from the sow in order to know when it is time to gather and suckle. Interruptions within the phases of the nursing cycle can lead to decreased milk consumption, and decreased milk production for the sow. Artificial weaning at young ages negatively affects piglets, which can result in fasting periods and reduced initial feed and water intakes. Designs in feeders and water dispensers need to accommodate for efficient accessibility for each animal,

maintain cleanliness, minimize wasted resources, and allow pigs to ingest water (and feed) using natural sucking motor patterns. Swine also have preferences for feed that come in certain forms and formulations. High palatability and physiochemical properties, such as fiber, can better reduce feeding motivation in pigs, especially when fed on restricted diets while also reducing expenses in feed.

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Management of Bovine Reproduction

*Kuilei Kramer
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Abstract

Having a well-coordinated reproductive program reflects the healthy performance of cattle herds. In most large operations, regular physical examinations are conducted to determine the overall health and proper function of breeding stock, as well as, treating diseases and culling animals with abnormalities and infertility. Cows and heifers are typically assessed via vaginal examination, rectal palpation and ultrasonography of the genital tract. Nutrition can also be applied in that well-portioned consumption of feeds yield greater conception rates and maintain ideal body condition scores. Bulls are more closely evaluated via Breeding Soundness Evaluations (BSE) for physical health, libido, scrotal palpation and measurement, rectal palpation, and semen quality testing.

Artificial insemination (AI) programs rely on the expression of estrus or "heat." Monitoring for estrous behavior in females requires skilled labor in simply observing them a few times per day prior to the breeding season. The availability of estrus detecting technologies allows more flexibility in knowing how much breeding stock is standing to be bred. If there are females that are still not cycling, then estrus synchronization can be utilized. Prostaglandin F_{2α} (PGF_{2α}) injections are commonly given to induce estrus cycling after some number of days and are administered in several different methods.

Diseases that are present within the herd tend to negatively affect reproductive performance, leading to delayed estrus cycling, infertility, and long term subfertility after treatment. Metritis and endometritis are common bacterial infections within the uterine body in postpartum females. Bovine viral diarrhea virus (BVDV) occurs in both male and female cattle causing acute or persistent infections that can be transmitted through infected semen, fomites, and placental membranes.

Introduction

Possessing a fundamental basis of managing bovine reproductive activity is required in both veterinarians and cattle operations. Largely-sized operations overseeing standard or elite status herds utilize reproductive control programs to increase profitability, efficiency and uniformity of the final product. Regular examinations of the breeding stock prior, during or following insemination are able to indicate presence or lack of reproductive soundness, physical deformities, and diseases.

Timing of artificial insemination (AI), or natural service breeding methods is crucial to regulate calving to

subsequent estrus cycling intervals. Therefore, knowing when females are in standing heat and using estrus synchronization methods can lead to more uniform conception and calving times between cows.

Many of commonly occurring diseases, such as Leptospirosis, can result in reduced reproductive performance of infected cattle. Abortions, weak or dying calves, conception difficulties, delayed estrus and ovulation, and infertility are all possibilities if not treated as soon as possible. In the end money and time invested into the operation will be wasted, but can be prevented if adequate reproductive programs are upheld.

Female Reproductive Examination

Post-pubertal female cattle should be physically examined to determine the state of general health and presence of disease that could inhibit reproductive performance. Commonly, the examination is conducted after 21 days postpartum or when heifers are ready to be bred (Sheldon et al., 2006). Females that have not conceived after the first insemination should be re-examined 24 days after the end of the voluntary waiting period (Sheldon et al., 2006). The following are typically evaluated: body condition, vaginal examination, trans-rectal palpation, and ultrasonography of the reproductive tract.

Body condition scoring should be intermediate, not too thin and no too fat. Insufficient adipose tissue for energy mobilization may lead to difficulties in conception and carrying out the gestation to full term, and the possibility of calving problems and very weak offspring. Excess in fats have similar results as being very underweight along with another. Subsequent to parturition depressed appetite may occur, therefore body score will decrease significantly (Sheldon et al., 2006), especially in dairy cows during peak lactation.

Examination of the genital tract via palpation or ultrasound is able to diagnose any infections and pathogens if present. Contents within the vagina, such as mucus, can be inspected for odor, viscosity, and color. Presence of pus would usually indicate the effects of endometritis (LeBlanc et al., 2002). For this particular scenario there is an estimated 44% success rate when using prostaglandin F_{2α} (PGF_{2α}) or intrauterine antibiotics over a two-week period (Sheldon and Noakes, 1998). Hence routine examinations by a veterinarian are highly recommended.

Breeding Soundness Evaluation in Bulls

If the option of AI is not available, then natural service from breeding bulls can be utilized. Prior to mating, it is advised to evaluate the selected bulls for any reproductive abnormalities via breeding soundness evaluation (BSE). The assessment includes observation of physical health, libido, testicular size, scrotal circumference, and semen quality (LeaMaster and DuPonte, 2007).

In the physical examination, the bull should walk on a hard, solid surface in order to see any lameness or hoof problems that could negatively affect mounting ability (LeaMaster and DuPonte, 2007). Other things to be aware of include eyesight, presence of disease, and parasites.

Possibly one of the more important and difficult parts of BSE is evaluating libido or sex drive. One way to conduct this is to expose the bull, but restrain it enough to prevent mating to cows, and see any presence or lack of sexual interest. Some studies have reported that libido in a yard test is highly correlated with serving capacity (number of females able to be mounted per bull) in pasture to where almost 10% of bulls could be culled due to inadequate sex drive (LeaMaster and DuPonte, 2007).

Similar to the physical exam, the reproductive organs, such as the penis and scrotum, should be inspected. Any deformations of the glans penis can lead to inability to copulate. Common abnormalities when palpating the scrotum include small or soft testicles, differences in size of testes, scrotal hernia, dermatitis, cryptorchids, and palpable epididymal conditions (LeaMaster and DuPonte, 2007). Circumference measurement of the scrotum indicates fertility and amount of sperm that can be produced. A larger circumference indicates a larger quantity of semen and therefore, a higher chance in healthy, motile spermatozoa. Bulls with above average scrotal size, especially in beef cattle, have shown to sire heifers that reach puberty at an earlier age than average (LeaMaster and DuPonte, 2007). To evaluate the inner reproductive organs, a veterinarian can perform a rectal palpation (similar to a prostate exam given to humans), to feel the prostate, the pelvic urethra, vesicular glands, ampullae, vas deferens, and internal inguinal rings (LeaMaster and DuPonte, 2007). Common abnormalities of these include seminal vesiculitis.

Lastly, semen inspection is conducted for quality and motility of spermatozoa. Assessment of volume, concentration, and percentage alive are no longer valid as scoring criteria due to low correlation with fertility and poor consistency with multiple collections (LeaMaster and DuPonte 2007).

Typically, it is advised to perform a BSE before the start of the breeding season. Any bull that has been observed with a defect or inability to mate can be immediately culled from the herd. However obtaining one or more replacement bulls may take time that could possibly cut into the breeding season. This also depends on when evaluations were conducted and availability of desirable sires. Another time, but relatively uncommon for BSE's, is during the actual season. Semen collection during this period can show if the bull has an adequate spermatogenesis rate while mating the herd (LeaMaster and DuPonte, 2007). Any decrease in semen quality would indicate overuse and the bull would need to rest and/or be replaced. Examinations, however, can be held at any time when necessary.

Nutrition

The quality and diversity of nutrients consumed by cows and heifers reflect their time of coming into puberty, estrus, ovulation and conception rates. Energy in the diet is one of the most important nutrients for cattle during the early postpartum period. Lactation requires a large amount of energy resources, especially in dairy breeds. Grains and concentrates are needed to maintain body condition. High-yield milk-producing cows tend to be in a negative energy balance state longer than less productive cows (Beever et al., 2001). This period can last up to 20 weeks in some postpartum cows (Beever et al., 2001).

Various hormones can be assessed from peripheral blood samples collected from cows in the negative balance state. Non-essential fatty acids (NEFA), β -hydroxy butyrate (BHB), glucose, insulin and insulin-like growth factor-1 (IGF-1) are measured to determine metabolic and fertility status (Kruip et al., 1998; O'Callaghan et al., 2001). Concentrations of NEFA and BHB indicate the amount of tissue being mobilized for energy production and are indirectly associated with fertility (Sheldon et al., 2006). Glucose, insulin, and IGF-1, on the other hand, influence reproductive function by acting on the ovaries, brain, and tubular genital tract (Wathes et al., 1998; Beam and Butler, 1999).

Urea is also measured as a metabolic parameter. When protein is broken down in the rumen, urea is produced. Thus, a high consumption of protein causes increased urea concentrations. Butler et al. (1996) observed cattle with 20% decreased pregnancy rates when blood urea concentrations were more than 7 mmol/L at the time of insemination. Elevated urea can also lead to excess ammonia, which may negatively affect oocyte and early embryo development (McEvoy et al., 1997).

Estrus Detection

Near initiation of the breeding season, cows and heifers must be receptive to mounting by experiencing estrus. Estrus or "heat," starts once at puberty and proceeds in a continuous cycle every 21 days on average with the actual estrous period lasting for a few days or so. However heifers experiencing their first cycle may stay in estrus for only one day or less, and not being receptive to mounting or having their first ovulation.

Potentially estrous females should be visually observed 2 to 3 times daily to see which can be bred (DuPonte, 2007). The most common behaviors expressed are mounting, standing to be mounted, and increased vocalization and activity. Physical indicators consist of having a swollen vulva that is slightly reddened and secreting mucus discharge. The mucus should be colorless, opaque, and should have a thick viscosity (DuPonte, 2007).

Estrus can be detected by simply observing specific cues in the herd. If this method cannot be done, there are several standing heat detector programs that

can be implemented. Steers (castrated bulls) can be equipped with a marker halter device strapped to the chin. When the bull successfully mounts, the chin-ball marker will activate and paint marks will appear on the left side of the female's back (DuPonte, 2007).

Adhesive heat pads are plastic detectors that are glued on the high spot in between the hipbones along the vertebrae. The cow must be ridden for at least 3 seconds in order to trigger the mechanism, causing a visual change or audible signal to be emitted (DuPonte, 2007). This particular method is not recommended when animals are out on pasture with low-lying trees or structures. An example of an adhesive heat pad is HeatWatch. This device uses the pressure pad as stated before, but also consists of radio telemetry that emits a signal to a computer when activated (Sheldon et al., 2006). KaMaR and Bovine Beacon are similar types of pads that turn color from white to red when triggered from persistent pressure (Sheldon et al., 2006).

Estrus Synchronization

Estrus synchronization is a reproductive program that utilizes techniques involving drugs, which suppress estrus for a certain period of time and then re-express estrus-inducing hormones. In other words, all synchronized females will come into heat, conceive, and give birth at relatively equal intervals. Natural methods that do not normally use injections exist; however, we will only talk about common drug-related methods that AI-based cattle operations typically use. The more common drugs involve prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$). $PGF_{2\alpha}$ is a lipid compound that plays various roles in the body, such as increasing blood pressure. More importantly, it takes part in luteolysis of corpora lutea in the ovaries. After the antral follicle releases the oocyte during ovulation, the follicle becomes a corpus luteum (yellow body), which secretes the pregnancy maintenance hormone, progesterone. Injection of $PGF_{2\alpha}$ causes luteolysis and regresses the corpus luteum so that estrogen can continue to be released for the estrus cycle after some number of days.

Administration of prostaglandin drugs are intramuscular and should be given deep in the neck area (DuPonte and Lee, 2007) in order to avoid residue accumulation in high-value carcass cuts. The correct amount of $PGF_{2\alpha}$ should be given based on criteria stated in the instructions given with a long needle, such as 18-gauge (DuPonte and Lee, 2007).

The one-shot $PGF_{2\alpha}$ method, by its name, consists of just one injection. At the start of breeding from days 1 to 5, only females that are in estrus are to be mated or inseminated as normally done. If animals are still not displaying signs of receptivity subsequent to day 6, $PGF_{2\alpha}$ can be administered. By day 11 a high percentage of the $PGF_{2\alpha}$ cows should be cycling and can be bred (DuPonte and Lee, 2007). This procedure

is based on the assumption that the herd is in adequate health. If less than 25% were able to be bred by day 6, then $PGF_{2\alpha}$ should not be given, as this could be a problem with animals coming into estrus (DuPonte and Lee, 2007). Subpar quality nutrition or presence of reproductive diseases is most likely the cause of cycling difficulties.

Modified two-shot $PGF_{2\alpha}$ involves two events of injections: the first on day 1 and the second on day 13. During the 13-day waiting period, the herd should be turned out to good quality pastures to maintain health and normal cyclicity (DuPonte and Lee, 2007). Originally the unmodified version required the second injection to be on day 11 rather than 13. However Deutscher (1990) stated that delaying the second shot results in a higher percentage of females coming into estrus. The regression of highly matured corpora lutea can cause increased receptive behaviors.

The controlled internal drug releasing (CIDR) device method incorporates a progestin implant with a plastic vaginal applicator that is inserted inside females on day 1. Then on day 6, all cows and heifers are administered with $PGF_{2\alpha}$. On day 7 the implants are removed from the vagina and animals are monitored for signs of estrus. Females will usually exhibit standing heat within 24 to 72 hours after injection (DuPonte and Lee, 2007). Anestrous and pre-pubertal females that take part in this method will cycle and come into puberty respectively from the progestin implant. Thus it is normal to see an approximate 10% increase of cattle experiencing sexual behaviors (DuPonte and Lee, 2007). But remember that young heifers first coming into their cycles may not be able to ovulate or carry out gestation without difficulties.

Comparing and contrasting between the three different techniques the one-shot method has the lowest drug expense, but in turn, requires almost three times as much skilled labor than the others (DuPonte and Lee, 2007). One-shot can also be flexible if less than 25% of the herd is not observed to have cycled before $PGF_{2\alpha}$ injection.

An advantage of the modified two-shot method is that the skilled labor is far less than that is required in one-shot. However, this takes the longest amount of time spent to complete (17 days) due to the waiting period between the first and second injections. In addition cows and heifers that are still not found to be cycling, especially after the second $PGF_{2\alpha}$ shot, will greatly increase costs (DuPonte and Lee, 2007).

Lastly, the CIDR method is the most expensive of the three methods, but involves the shortest amount of completion time and least amount of skill. The progestin implant is also able to induce estrus in non-cycling females, as well as bringing young heifers into puberty (DuPonte and Lee, 2007).

Clinical Diseases

In contrast to the vaginal environment, the uterine environment is maintained sterile and highly protected from pathogens. However immediately after parturition, invasive microorganisms are able to enter the reproductive tract in higher numbers, resulting in increased risk of infection. As stated earlier, it is important to evaluate breeding cows so that any diseases present can be treated.

Postpartum cows suffering from bacterial inflammatory reactions may have metritis. All layers of the uterus: endometrium, submucosa, muscularis and serosa, are severely inflamed (BonDurant, 1999). Up to the first 10 days cows experience high fevers (39.5°C or more). Odorous pus-filled discharge may be secreted from the vulva due to delayed uterine involution (Sheldon et al., 2006). Treatment is usually done by administering parenteral antibiotics, such as oxytetracycline or cephalosporins. Although oxytetracycline is widely used, it is not the optimal path for treatment as bacterial resistance and high minimum inhibitory concentrations exist (Sheldon et al., 2004).

Endometritis is similar to metritis, but specifically affects the endometrium layer of the uterus. Inflammation and vaginal pus are noted from persistent pathogenic bacteria for more than 3 weeks postpartum. Incidence of this infection is approximately 10 to 20% of dairy cattle (LeBlanc et al., 2002). If not immediately treated, endometritis can result in infertility throughout the period of infection and even subfertility after eradication of the pathogens (Sheldon et al., 2006).

Reproductive soundness can also be influenced by the presence of a virus. Occurring in both male and female cattle, the bovine viral diarrhea virus (BVDV) is one of the most serious reproductive pathogens worldwide (Fray et al., 2000). The virus exists in two types: non-cytopathogenic (NCP) and cytopathogenic (CP). The more common type is NCP as it is able to cross the placenta in BVDV-positive mothers, which can cause constant infection to the offspring. The CP type is unable to cause lifelong infections in calves (Brownlie et al., 1989), but can be derived from mutations of NCP viruses (Donis, 1995). The virus, regardless of type, is transmitted via contact with acutely infected cattle, fomites, bovine sera, rectal examination, infected semen, and contaminated vaccines (Nettleton and Entrican, 1995). In summation, BVDV is able to detrimentally affect the fertility and reproductive performance of host animals, especially those that are persistently infected (PI).

Viral bulls particularly in AI semen distribution companies must be dealt with care. PI bulls are still capable of producing semen of acceptable quality (Bielanski and Loewen, 1994), but are often associated with less than ideal fertility in most cases (Fray et al., 2000), such as abnormal morphologies and decreased

motility in spermatozoa (Rerell et al., 1988). Offspring of these sires are not always guaranteed to be clinically infected, but have a high risk of becoming PI hosts (Fray et al., 2000).

Cows and heifers infected shed the virus throughout their entire reproductive tract: layers of the uterus, placental membranes, oviducts (Booth et al., 1995), and the ovaries. Within the ovaries, Fray et al. (1998) reported that viral samples have been found in the interstitial, luteal, granulosa and thecal cells, and also in the follicular fluid. Infection during the time prior to ovulation reduces follicular growth rates (Fray et al., 1999). Females that have been treated with hormones that induce superovulation (more than one oocyte released) are not necessarily affected in regards to follicle growth (Kafi et al., 1997). However, quality of embryos and number of ovulations subsequent to superovulation are greatly decreased (Kafi et al., 1997).

It is still not fully understood how BVDV influences ovarian function, but there are three possible modes of action that could explain this. The first being that the pituitary gland within the brain is infected with the virus; thus rendering it unable to provide sufficient gonadotrophic support for normal ovulation (Anderson et al., 1987). The next idea suggests that since estradiol levels in plasma have been seen to reduce during infection; estrus cycling and ovulation cannot occur or function properly (Fray et al., 1999). The third is in regards to acute infections and states the possibility of reduced leukocytes in the ovaries, which help maintain normal follicle activity, due to the insufficient number of blood leukocytes (Adashi, 1990).

Conclusion

Planning and holding cattle examinations prior to the breeding season opens a large window of preparation. There will be times when the breeding stock will need to be replaced or treated for ailments in order to carry out functioning reproductive cycles. Efficient estrus detection can be time-consuming and may sometimes require a bit more effort than what is typically expected. When dealing with estrus synchronization, economic projections must be taken into account, as these can be futile and unnecessarily expensive if poor nutrition, disease, and the like are prevalent. However, cattle herds can become highly valuable in relation to efficiency and profitability as long as proper management within the operation is continually regulated.

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Ethics as they Apply to Non-Sexual Multiple Relationships in Therapeutic Counseling

Kristy Lungo
Psychology 470
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Abstract

Ethical decision-making has been shown to be particularly challenging for therapeutic counselors when they consider entry into a non-sexual dual relationship. Factors such as the nature of the relationship, be it business or social, cultural implications, urban or rural settings, timing, before during or after the therapeutic relationship occurs and sources of ethical guidance and risk management are discussed and explored for the purpose of fostering a rich understanding of how they effect a practitioners decisions. Ethical standards and moral decision making exist independent of therapeutic practice and are applied far beyond the narrow scope of clinical work. Practitioners are unique individuals who make ethical decisions based on their personal interpretation of their own principles and the principle and codes that are in place to guide them professionally. Because of this, the foundation of the upcoming discussion is deeply rooted in the application of virtue ethics, and how the development of personal ethical standards can result in sound moral and professional decisions.

Introduction

In the field of Clinical Psychology, ethics are one of the cornerstones of the profession. Ethics are a complicated subject and are more of a process of evaluation than a set of rules. The subject of multiple-relationships is particularly complex, largely because of the nature of human relationships. A clinical psychologist is not a solitary being devoid of social interaction, thus there is bound to be overlap between their professional and social lives. A clinical psychologist in a therapeutic setting will encounter a vast range of potential ethical dilemmas involving multiple-relationships. The subtleties of any one of these multiple-relationship dilemmas and how a clinician responds to them could tip the scales of ethical outcomes in a detrimental direction. That is to say, even a small decision that is made without careful thought and consideration for the well being of the client could result in real damage to the therapeutic relationship. Because of these intricacies, there is question as to whether or not the subject of multiple-relationships is adequately or realistically addressed in The American Psychological Association's Code of Conduct. It is possible that the subject is too complex to be addressed in a few short paragraphs in a well meaning, yet deliberately abbreviated guidance publication. In

an effort to better understand the full scope of these complexities, this review will consider the philosophical importance of ethics as it applies to the field of clinical psychology. The American Psychological Association's Code of Conduct and human relations, causes of unethical decision-making, sources of ethical guidance and support and the process of decision making and risk management.

Virtue Ethics

Clinical Psychology

Ethics is a comprehensive field that finds its seed in the study of ancient philosophy. It can be generally defined as the moral principles that govern a person or group's behavior (Stanford University Encyclopedia, 2003). In the field of clinical psychology, the APA's Code of Conduct applies these moral principles with a focus on the unique nature of the helping profession. Virtue ethics lends itself quite well to the work of a clinical therapist. Virtue ethics postulate that right or wrong does not only lie in its intrinsic value. Morally right actions are fluid or situational, and the outcomes of such actions are more global in that the wellbeing of all involved is considered the ultimate goal (Stanford Encyclopedia of Philosophy, 2003). This approach to moral judgment emphasizes the conscious effort that is made by the individual to be a good person, that is to act as a good person, will in essence cause that individual to behave in a way that will allow for the best possible outcome for all involved (Jeong, Hyemin, 2013). Continuous self-evaluation and evaluation of the changing environment is an essential part of the ethical decision making process (Jeong, Hyemin, 2013). The complexities of multiple-relationships require such conscious effort in not only the concrete aspect of compartmentalizing relationships in the physical sense, but also more importantly, how we deal with the emotional implications of our actions. To understand the importance of ethics as it applies to the practice of clinical therapy, it is imperative that there is a clear understanding of the importance of ethics and moral judgment devoid of the more narrow application to any particular field. From this perspective, it is clear that a general sense of moral behavior must be developed and cultivated at a more personal level ultimately providing a foundation for a therapist by nature and personal discipline to make moral decisions within his profession.

Principles

The principles of Clinical Psychology provide the practitioner with a good outline of what is considered ethical behavior. The principles are, by design, an abstract philosophical guide for moral character. Again, these principles exist outside of the field of clinical psychology, as well as in, and should be considered a valuable standard in all areas of life – both professional and personal. When embraced in this way, the lines of personal and professional relationships become blurred,

but the principles become well defined. When “do no harm” is not a principle that exists solely within the confines of clinical psychology, it becomes a personal mantra and thus adhered to in all aspects of life (Jeong, Hyemin, 2013). Ethics, and in particular, virtue ethics, imposes a certain level of responsibility on the therapist to be thoughtful and acutely aware of the implications of his professional actions, but in a deeply personal way. With all of this in mind, the principles of clinical psychology do offer a strong framework from which to build on when it comes to moral decisions on multiple-relationships. Virtue ethics could even be viewed as the primordial ooze from which clinical therapy sprang forth as they are founded in the cultivation of the wellbeing of all of humanity (Jeong, Hyemin, 2013). To some, this notion of wellbeing for all of humanity is perceived as an impossible task. The philosophical debate suggesting that in order to avoid causing harm to one it is inevitable that harm will, in some context, come to another. It is viewed as a moral dilemma of life (Kendler, 2002). To expect to resolve this dilemma within the micro-chasm of the field of clinical practice would be unrealistic and unusual. However, when the focus is on the wellbeing of the client, a practitioner has a defined range of parameters from which to base his decisions on. The boundaries are less abstract. It is not to say that a practitioner will never encounter such dilemmas, but that the principles of the field are focused squarely on the wellbeing of the client and thus gives the practitioner a strong sense of direction.

Code of Conduct

The Code of Conduct seems to be where some deficiencies or shortcomings appear when defining moral conduct in regards to multiple relationships (Anderson, Kitchener, 1996). It seems nearly impossible to address the host of multiple-relationship scenarios that can develop in the life of a clinical therapist (Burns, Goodman, Orman, 2012). This may explain why there are more books written on ethics than academic articles. In the APA's Code of Conduct, there is little more than a page and a half of print on the subject of “Human Relationships,” with only a tiny portion of that being dedicated specifically to “Multiple-Relationships.” Given that the APA's Code of Conduct is viewed as the primary source of ethical guidance, clinicians may feel they need to fill in the blanks when it comes to multiple-relationships (Gibson, Poke, 1993, Lamb, Catanzaro, Moorman, 2004). This is a little disconcerting, given a practitioner could lose his license to practice if the code is violated (Gottlieb, Younggren, 2009). It is not to say that the Code of Conduct should be the sole source of a practitioner's guidance. It only accentuates the need for a practitioner to expand his toolbox for personal ethical growth, as academic knowledge has little value without responsible application.

Human Relations

Multiple-Relationships

It should not be assumed that all relationships, which overlap professional and personal areas of a psychologist's life, are automatically placed in the category of unethical behavior. One study indicates that most overlaps transpire in social situations, after the therapeutic relationship has been terminated. Ethical concerns that are noted in post therapy are the potential for damaging effects of lingering transference that was formed during therapy or damage to the idealized image that a client might have of his therapist (Anderson, Kitchener, 1996, Fly, Bark, Kitchener, Lang 1997). Fewer incidents of overlap in professional or business relationships are indicated by the same study (Fly, Bark, Kitchener, Lang 1997, Lamb, Catanzaro, Moorman, 2004). Fewer still involve sexual relationships with clients (Gibson, Poke, 1993, Lamb, Catanzaro, Moorman, 2004, Zhao, Yang, Yang, Hou, Zhang, 2011). Overlap of a non-sexual nature is likely to repeatedly occur throughout the professional life of a therapeutic clinician. Conscious and deliberate attention focused on the potential negative effects of non-sexual multiple-relationships can easily be viewed as an extension of the therapeutic relationship. Given the likelihood of these occurrences, a clinician should be skilled at making critical evaluations of such situations to ensure they do not inadvertently violate their ethical responsibilities.

Conflict of Interest

Conflict of interest is high on the list of pitfalls that clinicians need to consider when evaluating multiple-relationships. Problems arise in business and billing practices when clinicians engage in trade for services or have secondary business relationships with their clients. Other conflicts occur when clinicians find that they have a relationship with a close friend or family member of a client (Gibson, Poke, 1993).

Exploitive Relationships

Exploitive relationships are by far the most damaging among clients, no matter when they occur. It is hard to believe that clinicians engage in such behaviors, and when they do, it is rarely by mistake. There is no contention that sexual exploitation of a client is predatory and illegal. However, other forms of exploitation can cause serious damage to the client's ability to not only trust their current clinician, but also any clinician. Asking a client to tell their “success” story to increase business or asking a client to promote a course of treatment changes the dynamics of the therapeutic relationship by making the client feel the request must be fulfilled to insure continued approval from their therapist (American Psychological Association, 2003).

Sexual and Non-Sexual Relationships

By comparison, most multiple-relationships that occur are of a non-sexual nature as are the dilemmas that arise from them (Gibson, Pope, 1993, Lamb, Catanzaro, Moorman, 2004, Zhao, Yang, Yang, et.al, 2011). There is greater disparity among practitioners as to what constitutes unethical behaviors in non-sexual multiple-relationship scenarios (Gibson, Pope, 1993, Lamb, Catanzaro, Moorman, 2004, Weirzbicki, Siderits, Kuchan, 2012, Zhao, Yang, Yang, et.al, 2011). A study that included inquiries made over a span of thirty years showed over 22% of the inquiries made by clinicians to the APA involved questions concerning multiple-relationships (Weirzbicki, Siderits, Kuchan, 2012).

Causes of Unethical Decision Making

Perspectives / Demographics

There has been a long-standing belief that gender, age, and level of education were predictors of ethical behavior. Many studies have shown that there are significant differences in how men and women perceive ethical behaviors (Gibson, Pope, 1993, Kish-Gephart, Harris, Trevino, 2010, Zhao, Yang, Yang, et.al, 2011). However, a meta-analysis conducted by Kish-Gephart, Harris and Trevino in 2010 shows that differences between men and women, when it comes to ethical decision-making, are negligible. Women were shown to be only slightly more likely to make ethical decisions. However, while there is little difference at the finish line in this comparison, there are some differences in what men and women consider ethical behavior when it comes to multiple-relationships. Men are more likely to view gift giving to clients as ethical behavior, more likely to view homosexuality as unethical and more likely to view sexual fantasy of clients as ethical. Men are also more likely to view intimate relationships with former clients as ethical (Gibson, Pope, 1993, Zhao, Yang, Yang, et. al, 2011).

Age was shown to have no significant difference as well (Kish-Gephart, Harris, Trevino, 2010). The primary difference being that older clinicians found it ethical to provide counseling to friends, employees and students (Gibson, Pope, 1993). Apparently, wisdom does not come with age. Again, this indicates some confusion on what constitutes appropriate or ethical behavior.

The most surprising find of the meta-analysis is that levels of education had no significant effect on ethical decision-making. This finding calls into question as to whether education can in fact enhance an individual's ability to make moral decisions (Kish-Gephart, Harris, Trevino, 2010). There is even some suggestion in current research that genetic variation in cognitive behavior may guide morality in spite of factual knowledge of what is right and wrong in terms of formal standards (Kendler, 2002).

Consensus and Dissent

It is very difficult to find a balance between personal perspective and that of an entire industry. Therapy by nature is a private experience for both the client and the clinician. Therapists have few occasions to compare their own behavior to the behavior of other therapists. Their moral behavior in relationship to their client is generally self-regulated. The industry relies on the individual integrity of the clinician to act in the best interest of the client. The decision making process for a psychologist who is engaged in therapeutic counseling is influenced by many factors. The complexity of these factors is particularly evident when practitioners attempt to manage multiple relationships (Anderson, Kitchener, 1996, Gibson, Pope, 1993). The skills to access and implement a variety of conflicting, and often ambiguous sources can make the path to good decision-making difficult to navigate (Gibson, Pope, 1993, Gottlieb, Younggren, 2009, Kendler, 2002, Weirzbickie, Sideritis, Kuchan, 2012). One study surveyed 579 certified counselors in the United States on their perception of 88 behaviors that are pertinent to ethical conduct in counseling settings. While most counselors conceded that sexual contact with clients was unethical, there was clear dissent in what constituted ethical behavior in non-sexual relationships (Gibson, Pope, 1993). A replica study done in China showed the same results (Zhao, Yang, Yang et. al, 2011). Over 40% of clinicians in the U.S. study rated behaviors such as going into business with a client, or providing counseling to friends, students and business associates as ethical behavior (Gibson, Pope, 1993).

Culture

Culture as a moral guide must be considered when discussing the nature of multiple relationships. The replica study that was done in China had a similar outcome as the original conducted in the U.S., but researchers of this article suggest that culture seems to play a role in non-sexual dual relationships, sighting Confucianism as a major influence that guides ethical decision-making (Gibson, Pope, 1993, Zhao, Yang, Yang, et.al, 2011). It should be noted that Chinese psychologist are held to their own Code of Conduct but that the content of their guide holds nearly identical standards as its U.S. counterpart (Chinese Psychological Society, 2007). In some cultures, familiarity with a clinician is essential in order to establish trust between the client and the clinician before a therapeutic relationship is established. Often, culture plays a role in how the family is involved in a client's therapy or how a client is referred to a therapist (Barnett, Lazarus, Vasquez, Moorehead-Slaughter & Johnson, 2007).

Geographical Implications

The difference between urban and rural settings when it comes to multiple-relationships suggests that psychologists in urban areas are particularly challenged by their geographic location. In one study, it was shown that a rural psychologist is far more likely to encounter situations involving ethical decision on multiple-relationships. In smaller communities, psychologists often find themselves treating clients who are close friends or family members with each other, which can complicate confidentiality. In rural settings, a psychologist may have business or social relationships with clients simply because he is the only clinician in the area and refusal to treat a distressed client can have devastating results (Helbok, Marinelli, Walls, 2006). In such settings, a clinician must be particularly careful about how they manage their professional and personal lives. Due to their unique set of circumstances, there is a clear difference in the frequency and nature of ethical decisions that rural clinicians must make. Rural practitioners must keep their ethical skills well honed, which can be a source of great concern. Many rural clinicians have expressed some distress over their seemingly creative efforts they must make to operate within the APA's Code of Conduct (Helbok, Marinelli, Walls, 2006). The issue of overlap can even effect a clinician's decision to enter into intimate relationships due to personal privacy concerns in small communities (Lamb, Cantanzaro, Moorman, 2004).

Ambiguity

The difficulty in decision making when it comes to concepts that are more abstract may find its roots at the very heart of the scientist-practitioner training model. From a philosophical perspective, the decision-making process is twofold, assessment of cold, hard facts, or naturalism and the evaluation of the moral outcome, the latter of which, is not always supported by the former (Jeong, Hyemin, 2013). The scientist-practitioner model is analogous to the ethical decision making process, the scientist, represents facts or codes of the profession, and the practitioner, represents the moral application of the facts, or treatment that is implemented in the best interest of the client. (Jeong, Hyemin, 2013). This way of thinking is a great model and foundational to the work. While in practice, a practitioner may find that they have to be a little more creative in how they handle decisions about multiple relationships. A practitioner may have to consider everything they should not do and then everything they can do, weigh the value of a multitude of possible outcomes, and then adjust accordingly. Many factors pull and tug at the boundaries of ethical behavior, making it nearly impossible to create hard and fast regulations that govern ethical decisions in multiple-relationships. As is true with the application of research to therapy, a practitioner must be able to take their knowledge of ethics and apply it to real world situations in a meaningful way.

Sources of Ethical Guidance and Support

Examples of sources of ethical guidance include the APA Code of Conduct, AAC Ethical Standards, state boards, supervisors, research, formal education, training and a myriad of ethics committees. In one study that looked at 16 sources for counseling psychologists, practitioners scored the majority of them in the "terrible" to "good" range, with only the American Association of Counseling Ethical Standards scoring in the "excellent" range (Gibson, Pope, 1993). Another study suggests that the APA's Code of Conduct does not deter multiple-relationships of a sexual nature and offers limited guidance in non-sexual multiple-relationship encounters (Anderson, Kitchener, 1998, Lamb, Cantanzaro, Moorman, 2004). Research on clinicians who practice in rural settings shows that the ethical standards in the field fail to address their unique circumstances resulting from proximity when it comes to multiple-relationships (Harbok, Marinelli, Walls, 2006, Lamb, Cantanzaro, Moorman, 2004, Younggren, Gottlieb, 2004). This almost suggests that counselors are flying by the seat of their pants when it comes to obtaining outside support in regards to situations where they have to make difficult ethical decisions. The APA's Ethics Committee reports that there is a steady increase in the number of ethical inquiries. The numbers indicate that multiple-relationship inquiries from professionals rank third on the list (Wierzbicki, Sderits, Kuchan, 2012). The implication being current ethical sources are lacking in their ability to offer sufficient guidance to clinicians when it comes to the complexities of multiple-relationships.

Decision Making and Risk Management

Understanding risk management when considering dual or multiple-relationships is essential if a clinician wants to successfully navigate these treacherous waters. The APA's Code of Conduct is clear in stating that not all multiple-relationships are considered unethical, and yet offers little specific guidance as to what is (American Psychological Association 2003). Lawyers advise clinicians to avoid all potential multiple-relationships if they want to avoid possible violations of the Code of Ethics, or worse, legal action (Younggren, Gottlieb, 2004). In rural settings, such avoidance could result in total isolation of a clinician (Helbok, Marinelli, Walls, 2006).

Younggren and Gottlieb in a 1998 article recommend that a clinician approach dual relationship decisions by asking a very specific list of questions before and after entering such relationships. These questions are highly focused on the well being of the client but also address the issue of risk that the clinician takes when entering such relationships. A meta-analysis on causes of unethical decisions showed that the fear of formal disciplinary action deters unethical decisions. Further, the study suggests that a heightened sense of morality can create dissonance in certain individuals who are in the midst of ethical dilemmas, rendering them incapable

of making unethical choices without causing great discomfort (Kisg-Gephart, Harrison, Trevino, 2010).

A full evaluation of the dual relationship situation and all that entering into it entails is a good place to start. The continued monitoring and adjustment of the relationship is just as essential. The multiple or dual relationship is the epitome of a high maintenance relationship and requires a clinician to be hypersensitive to both the needs of the client and the morality of the practitioner. Continued monitoring of both can keep a clinician on the right track. A continued effort on staying updated on current laws and ethical policies is the responsibility of the practitioner, and is one that all practitioners should take seriously (American Psychological Association, 2003).

Discussion

Given the complexities of ethical decision making when it comes to multiple-relationships, it seems vital that clinicians, and those who hold court over them, cannot operate on cruise control. Every individual is unique. The relationships that evolve between people are intertwined within the communities in which they occur. Clinicians are hard pressed to pay close attention to their clients and the overlap of relationships that can occur outside of the clinical setting. It is clear that a practitioner is held to a much higher ethical standard than most professionals are. The very wellbeing of their clients depends on their moral diligence. The private nature of psychological treatment and the exclusive relationship that develops between the clinician and his client because of that treatment are reliant on the practitioners care. To risk such a relationship is to say that a clinician does not value the very people he dedicated his life to helping. The importance of a clinician's effort to understand all of the factors that can put a client at risk is clear. While many of the formal sources of ethical guidance are found to lack the black and white guidelines of what is and is not ethical, the practitioner can educate himself to become an expert in his own unique situation. An environment that allows non-judgmental, open, and frank discussions on such unique issues is paramount. There is a lot to be said about the tradition of healthy but aggressive debate on situational ethics. An anonymous forum could prove to be quite insightful.

Conclusion

Road blocks to successful ethical decision-making in managing multiple relationships include a lack of formal education in ethics, limited sources of meaningful guidance, poor to no training in situational ethics, a lack of agreement among peers and mentors as to what constitutes unethical behavior, lack of research and failure to fully understand the value of risk management. The APA is actively perusing a remedy to these problems, as is the research community. In response to preliminary studies, graduate programs began to include formal

ethics training in their Masters and Doctorates programs. However, it is unclear if formal training is enough, as current studies suggest that in general, higher levels of education have no significant effect on ethical decision-making. However, it is not to say that ethical training applied to the field of psychology is ineffective. Research has expanded to include the formal application of ethics as it relates to the field of psychology in a plethora of situations and settings. In fact, there has been an explosion of research on ethical behavior in all areas of clinical and counseling psychology. Most interesting is the research that acknowledges the all-encompassing nature of ethics and the value that it holds for those who make the conscious effort to be better people and thus better clinicians. Finally, training in risk management can guide practitioners when making decisions as well as boost their confidence that the decisions they make are the right ones. There has been a notable increase in the inquiries to the APA's Board of Ethics from the field, suggesting that clinicians are hungry for guidance and have a genuine desire to act in the absolute best interest of their clients. It is clear there is a real conversation-taking place within the industry and this can only be good for all involved. The ancient philosophy of virtue ethics does appear to be the continuing guiding light for the modern practitioner.

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The Relationship of Religiosity, Atheism, Belief and Intelligence

Kristy Lungo
Psychology 321
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Abstract

There are many contributing factors that relate to religious belief and disbelief. A brief review of current literature indicates a recurring theme in support of the negative relationship between intelligence and religiosity. These studies show that higher Intelligence Quotient's (IQ) correlate with lower religious belief and atheism. To gain a greater understanding of that relationship, studies on curiosity and emotional intelligence, belief and evolutionary theory were considered. Directionality is indicated in some studies, which suggest that increased cognitive abilities lead to a decrease in religious belief. Evolutionary theory also supports directionality in that it suggests that belief in the divine is an ancestral behavior and atheism is the later novel behavior (Bertsch & Pesta, 2009). Additionally the way beliefs are valued and attributed can determine the strength of our beliefs. The depth of our core beliefs can contribute to our willingness to change or alter them. Curiosity and emotional intelligence can lead to questioning and changing beliefs (Canna, Calhouna, Tedeschia, Kilmera, Gil-Rivasa, Vishnevskya, and Danhauerb, 2010). The current research provides hints to the links between the contributing factors of why some people change their beliefs and why others do not (Leonard, Harvey, 2007)

Introduction

Religious belief has served humanity in a myriad of ways. It would seem that any question that could not be answered within the context of man's current intellectual capacity would be deferred to a higher power. Any explanation of humanities existence that was beyond man's grasp was equated to the divine. While today the answers to the mysteries of life still escapes us, the questions we ask are less inhibited by the restrictions of such religious dogma. Blind faith, while still practiced, is not a practical approach to resolving the complex problems of modern society. Humankind has evolved, and in growing numbers, people no longer fear challenging religious ideology or even putting religious practice completely aside as atheism is more widely accepted as a viable alternative to religiosity. The following literature review will show that there is a negative relationship between intelligence and religious belief and further, attempt to explain the transition from a position of religious faith to that of a nonbeliever by looking at how a belief is acquired, what happens when it is challenged and what is required for a belief to be changed.

Secular rises in IQ scores are occurring worldwide. One explanation is that our current understanding of the world and the need for realistic explanations for our day-to-day experiences are in direct conflict with ancient religious teachings (Bertsch & Pesta, 2009). IQ increases are a good place to start looking for clarification as to why religiosity is questioned to begin with. A study of 137 countries shows a 0.60 correlation between National IQ's and disbelief in God (Lynn, Harvey & Nyborg, 2009). In support of these findings, atheists are shown to score consistently higher on IQ tests in comparison to those who are considered to be highly religious (Bertsch & Pesta, 2009). Intellectual elites are shown to have a higher percentage of non-religious beliefs as compared to the general population (Lynn, Harvey & Nyborg, 2009).

Additionally, there is also evidence that shows a decline in religious belief from adolescence to adulthood. The decline is attributed to the increase in cognitive ability during this important developmental transition (Lynn, Harvey & Nyborg, 2009). Further, the National Longitudinal Study of Youth, which measured nearly 7000 American Children between the ages of 12 and 17 in religious belief and psychometric g, the general factor in intelligence, and found that atheists scored 6 g IQ points higher than the combined groups of students who followed a particular faith (Moore, Pedlow, Krishnamurthy & Wolter, 1997). In a study conducted by Lewis (2011) on the relationship between intelligence and multiple domains of religious belief, the personality trait of openness to new experiences is controlled as both religious belief and intelligence, are correlated with this trait as defined by the theory of the Big Five (Lewis, Ritchie, & Bates, 2011). Openness was viewed as a potential confound because nonbelievers may have simply been open to the experience of alternative explanations of religion as opposed to having higher intelligence. Six religious domains ranging from Mindfulness, a less rigid religious perspective, to Fundamentalism and a strict adherence to religious doctrine were measured against intelligence and cognitive ability. The study found that five of the six measures negatively associated with intelligence, with Fundamentalism having the strongest negative association of B -.13 and removing education from this measure increased it to B -.25. Openness did in fact predict for the less strict religious domains however the relationship was opposite for fundamentalism (Lewis, Ritchie, Bates, 2011). Intellectual conflict with scriptures is also a consideration in this study as the author theorizes that increased cognitive and intellectual ability directs such individuals (Lewis, Ritchie & Bates, 2011).

Another aspect of religiosity's relationship to intelligence that should be considered is the behavior of questioning and when it is deployed to acquire knowledge, as opposed to when one chooses to act without question. In a study done by Nancy Leonard and Michael Harvey (2007), curiosity is shown to be a

predictor of emotional intelligence. The trait of curiosity is the willingness to expose oneself to new information and a motivation resulting in exploratory behavior. Emotional intelligence is defined as the ability to monitor one's own and others emotions and to use them to guide one's thinking and actions (Leonard & Harvey, 2007). These traits applied to religious belief have some interesting implications. Curiosity seems to be at odds with rigid fundamentalist dogma as questioning such deeply seated beliefs is forbidden. Emotional intelligence differs somewhat from general intelligence in that it is centered on emotional ability as opposed to cognitive processing, though emotional intelligence still involves cognitive skill in the use of emotion. Such exploratory behavior or questioning of religious belief can be an emotional, and potentially frightening, notion to the faithful considering the possible repercussion for questioning the existence of God. With this thought in mind, the following study looks at anxiety as it relates to religious belief. Toburen & Meier (2010) did a study, which showed that priming God related concepts increased anxiety and task persistence. Toburen's study showed that participant's anxiety increased when presented with unsolvable word scrambles that contained God related verbiage. The anxiety was equated to the participants fear that God was watching them and thus pressured them to perform with increased persistence without ever questioning the insolvability of the task (Toburen & Meier, 2010). Why then do people choose to question one situation over another? The process of acquiring a set of beliefs is intricate and complicated; though once we have acquired a set of beliefs it may be even more difficult to change them. Core beliefs are foundational. When people are faced with conflicting information that involves foundational beliefs, they must consider that there may be a great undertaking that follows as not only does the change of their core belief need to be accommodated, but the cascade of all subsequent beliefs must also be adjusted (Canna, Calhoun, Tedeschi, Kilmer, Gil-Rivas & Vishnevsky, 2010). The process by which people make these decisions is shown to lie in our evaluation or in the value we place on our beliefs. In a study done by Jesse Preston and Nicholas Epley (2005), the explanatory power of valuable beliefs was explored. The study showed that belief is not just a perceived truth; it also holds a perceived value. When a belief was applied as an explanation to a cherished religious belief, it was shown to hold more value as compared to a one that could be easily explained (Preston & Epley, 2005). In other words, the greater the mystery of a belief, the more value that belief held. When beliefs have a great deal of strength or value, it is not surprising they are not questioned. However, if one is curious, has emotional intelligence and is motivated to question such beliefs he may hypothetically fall into the category of people who move beyond their own core belief system and into a realm that may allow them to consider intellectual pursuits that had previously been beyond their reach,

due to the limitations of religious dogma and ultimately achieving greater intelligence.

Finally, evolutionary psychology offers its own theorem, which further supports the relationship between intelligence and religiosity through the Savanna-IQ Interaction Hypothesis, which explains how intelligence represents a direct link to novel ancestral behaviors. The Savanna Principle is founded in the theory that what is known as general intelligence today, evolved from what was once novel adaptive behavior (Kanazawa, 2010). In application of this theory, the evolutionary value of intelligence finds its roots in novel non-recurrent ancestral problem resolution. According to this theory, religiosity is considered historically ancestral there by resolving atheism to being the novel adaptive and intelligent behavior, which may in future generations be considered a mainstream value (Kanazawa, 2010). The theory further suggests directionality in that religiosity came first and was followed by the novel behavior of atheism.

Critique

Current research leaves little room for question when it comes to the negative relationship between intelligence and religious belief (Lewis, Ritchie & Bates, 2011) (Lynn, 2009) (Bertsch & Pesta, 2009). There have been many approaches to studying this relationship, though most of them are correlation studies (Lynn, Harvey & Nyborg, 2009) (Lewis, Ritchie & Bates, 2011). Most studies look at religiosity in degrees of practice or depth of belief or non-belief, and then correlate the data with IQ tests (Bertsch & Pesta, 2009) (Lewis, Ritchie & Bates, 2011) (Lynn, Harvey & Nyborg 2009). Some studies have been done on cognitive abilities in association to intelligence, which also show a negative relationship to religious belief (Bertsch & Pesta, 2009). One confounding variable that has been found in nearly all of the studies is the use of college students as participants who are by circumstance, more educated (Lynn, Harvey & Nyborg, 2009). A few studies used a wider range of participants and actually controlled for education levels with good results (Lewis, Ritchie & Bates, 2011). Another confounding variable is that most studies are conducted with a focus on Christianity, and often place participants with non-Christian faiths in with the atheist or agnostic ideologies in the comparison groups (Bertsch & Pesta, 2009) (Lynn, Harvey & Nyborg, 2009) (Toburen & Meier, 2010). A final note on confounding variables in intelligence as it relates to religious belief is that the trait of openness was considered a potential confound (Lewis, Ritchie & Bates, 2011). While openness is accepted as one of the Big Five personality traits, the definition and even the cross-cultural application of the term varies, and thus is a confound in and of itself. Curiosity as a predictor of emotional intelligence as it relates to the motivation to question and explore, has peripheral importance in how higher intelligence may negatively correlate to religious belief (Leonard & Harvey, 2007). However, this is an

area of research that is lacking in terms of studies that relate directly to the subject. More studies that look at curiosity and emotional intelligence as they relate to religious questioning could bare interesting insight into the process of how people make decisions about their religious belief. Further, studies that look at the direction of change in religious belief that range from believer to non-believer or vice-versa are nonexistent. There is a real need to look at the dynamics of the movement from believer to nonbeliever if it is to be proven that curiosity and increased intelligence are the cause. An even more important area of research that is a very big part of that dynamic is the dichotomy of anxiety and courage as it relates to the degree of questioning religious belief. Again, such studies seem to be nonexistent.

Evolutionary theory is said to be difficult to support through direct research because it relies on assumptions of historical events. However, it is common knowledge that only a few hundred years ago, humankind believed that the world was the center of the universe and the earth was flat. The novel idea was that the sun was at the center of our solar system and the earth was round. It is not hard to see how humanity has benefitted from changing our beliefs on these two subjects. Who is to say that religious belief is not on the same course and that studies that show a decrease in religiosity are not early indicators of a shift in mainstream beliefs?

How we value our beliefs and how we attribute them play an important role in our decision to hold onto one belief over another. It seems that the biggest hurdle to overcome when researching subject matter of a religious nature is that it seems to be handled with children's gloves. Studies on belief in "religion" should not be treated as exclusive. Belief and the process of coming to believe or disbelieve, is only exclusive as a mental process or progression of processes, no more and no less.

Conclusion

Like any other pursuit of knowledge, we should treat the study of religious belief without accommodation. If the subject matter is in contrast with fact, it should be rigorously challenged to the benefit of believers and non-believers alike. The relationship of intelligence and religiosity has been explored since the age of reason. Men of science have been imprisoned and even lost their lives in pursuit of knowledge that conflicted with the church. Not only religious belief, but also the fear of questioning it has evolutionary roots (Kanazawa, 2010). The negative relationship between intelligence and religious belief has been repeatedly reflected in numerous scientific studies (Bertsch & Pesta 2009) (Lewis, Ritchie & Bates, 2011) (Lynn, Harvey & Nyborg, 2009). There have been extensive peripheral studies that tiptoe around the perceived central issue, that being, the very existence of God. As hard as scientists have held that such theological questions are not meant to be answered in the lab, science seems to be heading in that direction.

However, a more accurate description of the research is not so much that science is trying to determine the status of God's existence as much as it is trying to understand the "belief" or "disbelief" in His existence. In an effort to understand why people choose to believe or not believe in their religious ideology, science must first understand the process through which beliefs are acquired, held or changed. Before a belief can be changed, it must be questioned. Before a belief is questioned, powerful information to the contrary must be presented and acknowledged. Stirring curiosity leads to motivating the individual to explore alternative possibilities. As a result, the mind expands, knowledge increases and a new belief is formed. The process is no different than the process through which a child comes to terms with the non-existence of Santa Clause. As the child's cognitive abilities expand, he acquires conflicting information. When the conflicting information is overwhelming, the child changes his/her belief.

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Distorted Reality: The Devaluation of Pocahontas

Kara Nelson
English 351
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"No! If you kill him you'll have to kill me too," Pocahontas cries as she shields John Smith from a death blow (Gabriel & Goldberg *Pocahontas*). Her father replies, "Daughter, stand back," to which she insists, "I won't! I love him, Father" (Gabriel & Goldberg, *Pocahontas*). What young, easily impressionable girl would not be struck by filial defiance for the sake of the true love? Perhaps some find such a story trite or unexciting but I, like other girls, was misguided enough to believe an over-romanticized story based on, at best, conjecture, or, at worst, outright lies. The movie industry has repeatedly taken the historic figure of Pocahontas, an incredible woman of whom we know very little, and has turned her into a young, Native American star-crossed lover of John Smith. Camilla Townsend aptly states in *Pocahontas and the Powhatan Dilemma*: "Myths can lend meaning to our days, and they can inspire wonderful movies. They are also deadly to our understanding. They diminish the influence of facts, and a historical figure's ability to make us think; they diminish our ability to see with fresh eyes" (ix-x). *The New World*, *Pocahontas*, and *Pocahontas II* use the historical Pocahontas to portray a romantic vision and, although they try to portray her in a positive light, they ultimately strip her of her dignity, power, and true value.

Captain John Smith (1580-1631), the famous English traveler who was among the first colonists to settle in the New World's Jamestown colony, may have started the controversy about Pocahontas when he wrote about her rescuing him from death at Powhatan's court (Winans 315-316). In his book *The Generall [sic] Historie [sic] of Virginia, New-England, and the Summer Isles*, Smith relates that after a feast and a "long consultation," his head was forcefully put against two stones, and when the Indians were about to "beate [sic] out his brains":

Pocahontas, the Kings dearest daughter, when no intreaty [sic] could prevaile [sic], got his head in her armes [sic], and laid her owne [sic] upon his to save him from death: whereat the Emperour [sic] was contented he should live to make him hatchets, and her bells, beads, and occupations as themselves (Smith, *General Historie [sic]* 317-318). How romantic! In a ceremony two days later, Powhatan adopted Smith as a son, naming him *Nantaquoud*. (Winans 318)

What is fact and what is myth? Who is the mysterious Pocahontas? One way to put it is: "She was the first

Indian to be baptized, the first to marry a white man, among the first Americans to visit London and the very first to be buried in European soil" (Howe & Bensimhon). "Pocahontas" means "little wanton" or, in modern language, "little mischievous one" (Rountree 16). She also had the names Matoaka and Amonute (Rountree 15). She was born around 1595 to 1596 (Rountree 15). She died in 1617 at the age of 21, before their ship could leave England on the return voyage (Rountree 25; Price 183-184). Another source claims she died at age 22 (Rasmussen & Tilton). Helen Rountree notes: "In her own lifetime, Pocahontas was not particularly important. In fact, very few Virginia records dating from her lifetime even mentioned her. No writer left us with more than little snippets about her . . ." (14). And what we do know about her, or other Indian women, was written by men: "European men largely controlled the historical record, and they were interested in trade, war, and land acquisition rather than in women's roles" (Perdue 4, Introduction). This opinion is backed by another source: ". . . she is visible only in the comments left by the white men who knew her and wrote down their impressions. What we glean comes from reading between the lines" (Townsend 71-72).

Smith's famous story was written when few were alive to contradict its accuracy (Rountree 14). Since 1860, the truth of the account has been disputed (Lemay 2). Rountree highlights the inaccuracy of the punishment Smith anticipated receiving and states his life probably was not in danger, hence ". . . Pocahontas probably did not save Smith's life . . ." (18). This opinion is backed by Townsend, who relates that Smith's writings often had beautiful women saving him and that travel narratives contained some fictionalized events, thus according to cultural standards, ". . . the sequence of events in Smith's story is implausible" (54-55). Rasmussen and Tilton state, "Until proven otherwise, Pocahontas should probably be awarded credit for saving Smith, if only from a test of his composure under duress" (Rasmussen & Tilton). Both Disney's *Pocahontas* and New Line Cinema's *The New World* portray her rescue of Smith. Whether or not this incident is true, it has been blown out of proportion and expanded to include a great love affair that probably did not exist.

In Disney's *Pocahontas*, she is a mature young woman, not a young girl. Historically, she was about ten years old when Smith was captured (Townsend 52). Although the movie romanticizes her saving of him, it at the same time empowers her. Pocahontas states, "This is where the path of hatred has brought us," since the movie dramatically and inaccurately places Smith's attempted execution at the climax, with English and Indian forces ready for full-scale warfare (Gabriel & Goldberg *Pocahontas*). Powhatan is moved and says "My daughter speaks with a wisdom beyond her years," and continues, "We have all come here with anger in our hearts. But she comes here with courage and understanding. From this day forward, if there is to be more killing, it will not start

with me" (Gabriel & Goldberg, *Pocahontas*). Hence, she is shown to be so powerful as to influence all but the "bad guy" (Ratcliffe) to stop fighting.

New Line Cinema's *The New World* uses the same incident as a springboard to divest Pocahontas of her independence. She is also portrayed as a young teenager. Smith narrates, "At the moment I was to die she threw herself upon me" (Malick, *The New World*). Powhatan then decides, "He can teach her about his land across the waves," which puts her in a learning role and sets up the interaction that leads to them falling in love (Malick, *The New World*). They start a romance because the movie wrongly has Smith stay with the Indians for a substantial amount of time after the incident and seemingly "going native," gaining immense appreciation for the Indian culture. In the movie, Smith seemingly idolizes Pocahontas, noting her beauty was such "that the sun himself, though he saw her often, was surprised whenever she came out into his presence" (Malick, *The New World*). He also thinks: "She exceeded the rest not only in feature and proportion, but in wit and spirit too. All loved her" (Malick, *The New World*). Powhatan sees the danger of a love affair, for he warns his daughter: "Promise me – you will put your people before all else," in which she replies, "I know myself," while Powhatan continues, "Even before your own heart. He is not one of us" (Malick, *The New World*).

Along the romance vein, *The New World* has camera angles of Pocahontas and John Smith hesitatingly and longingly touching, caressing, lying down, nuzzling, and kissing. The movie has Pocahontas question herself, "Afraid of myself. A god, he seems to me. What else is life but being near you? Do they suspect? Oh, to be given to you, you to me. I will be faithful to you. True. Two no more. One. One. I am. I am" (Malick, *The New World*). Hence, she becomes a young girl hopelessly in love and more disturbingly idolizing a European man, which could arguably be considered part of the Self and Other dialectic noted by Beauvoir between men, "the Absolute" and "the Subject," and women, "the Other" (Easthope and McGowan 52). Having Pocahontas consider Smith as a god is unjust, since Townsend claims, "At no point did Powhatan, Pocahontas, or any of their people look on the strangers with wide-mouthed awe or consider them gods" (63). If the movie were accurate, this romantic interlude and period of "going native" would be omitted, considering Smith returned home a few days after his near-death experience (Price 58).

Another way in which movies portray Pocahontas inaccurately is through the presence and absence of Kocoum (Kuocum). William Strachey noted in 1612 (three years after Smith left) that she was married to Kocoum, a "private Captayne" for a couple of years (Rountree 20), and she would have been 12 or 13 at that time (Townsend 85). Paula Gunn Allen, however, claims it is "likely" that she married Kuocum and had one child with him (218). It is also unknown if they

divorced or he died (Townsend 87). His character is completely absent from *The New World*. In the movie, Smith stays with Pocahontas for too long, and love-struck John Rolfe comes in after Smith leaves. Before Pocahontas falls in love with Smith, there is a young man with whom she seems playful and affectionate, and she is upset when he is killed in a battle against the white men. However, their exact relationship is not clear. In Disney's *Pocahontas*, Kocoum is inaccurately portrayed as Pocahontas' intended husband, and as a jealous lover set on protecting her from the white men. When Kocoum attacks Smith, Pocahontas tries to stop the fighting; however a young colonist named Thomas fatally shoots Kocoum, leading to Smith's imprisonment. Powhatan reprimands Pocahontas, "Because of your foolishness, Kocoum is dead" (Gabriel & Goldberg, *Pocahontas*). Not only are both movies historically inaccurate, but they both take away a coming-of-age event in Pocahontas' life and deny her the power of making choices. She was no longer a girl once the historical Pocahontas married: "The significance of Pocahontas's status as a married woman is that it was a prerequisite for her taking a full adult role in the *tsenacommahah*" (Allen 218-219). She most likely chose to marry Kocoum because she was free to choose her own husband (Townsend 86). As a "young married woman," Pocahontas would have been able to choose to have long hair or short hair and probably had tattoos on her arms or legs (Townsend 88).

In *The New World*, Pocahontas is entrapped by a hopeless passion that probably didn't exist. After she is kidnapped, Smith says, "They said they were going to fetch you. I was against it! I didn't want to hurt you. And now there's disaster all around us. We should have stopped before it was too late" (Malick, *The New World*). Not long after, Pocahontas again falls into breathless love, as she narrates: "What is right? Give? Wrong? Who is this man? Now all is perfect. Let me be lost. True. You flow through me. Like a river. Come. Follow me" (Malick, *The New World*). She even tells Smith, "You have no evil. I belong to you" (Malick, *The New World*).

Disney's *Pocahontas* also forces her to be dependent on love when she is portrayed as telling John Smith, "I can't leave you" (Gabriel & Goldberg, *Pocahontas*). Yet, Pocahontas empowers her at the end by having her end the love affair with Smith after he's inaccurately injured saving Powhatan's life (Gabriel & Goldberg, *Pocahontas*). Wounded and bound for England, Disney's Smith asks Pocahontas to come with him and Powhatan tells her, "You must choose your own path" (Gabriel & Goldberg, *Pocahontas*). She finds she is needed and she chooses to stay behind, telling Smith he needs to go back when he tries to say he will stay with her (Gabriel & Goldberg, *Pocahontas*). She tells him, "No matter what happens, I'll always be with you, forever" and sings the line, "And I'm so grateful to you" (Gabriel & Goldberg, *Pocahontas*). She says goodbye to Smith, kisses him, and runs to watch the ship leave (Gabriel & Goldberg, *Pocahontas*). In reality, Smith left

without saying goodbye after being terribly burned in a gunpowder accident (Rountree 20). While inaccurate, Disney at least leaves her an independent woman instead of a star-crossed lover powerless in the wake of passion.

In *The New World*, Smith also leaves, and gives instructions to others to tell Pocahontas he is dead after he has been gone two months (Malick). Pocahontas is severely grief-stricken when she hears of Smith's death (Malick, *The New World*). John Rolfe says that she was considered "finished, broken, lost" (Malick, *The New World*). It is only through Rolfe that she is eventually redeemed. She agrees to marry him even though it is clear she is not madly in love with him and she does not make a free choice. Take, for example, this passage from the proposal scene, (after she has been given the Christian name Rebecca):

Rolfe: Why do you shrink from me? Won't you say yes?

Pocahontas: If you'd like.

Rolfe: This isn't what I expected, Rebecca.

Pocahontas: Sorry.

Rolfe: Why are you crying?

Pocahontas: I suppose . . . I must be happy.

Rolfe: You do not love me now. Someday you will. (Malick, *The New World*)

She wonders, "Mother, why can I not feel as I should? Must? Once false, I must not be again. Take out the thorn" (Malick, *The New World*). They fall in love. She thinks, "He is like a tree. He shelters me. I lie in his shade. Can I ignore my heart? What is from you, and what is not?" (Malick *The New World*). Here again, Pocahontas relies on a man for strength. When she finds out Smith is alive, she tells Rolfe she is actually married to Smith, to which he replies, "Married? You don't know the meaning of the word, exactly" (Malick, *The New World*).

In reality, she did choose to get married and baptized: "It is clear that Pocahontas was doing, at least to some extent, what she wanted to do" (Townsend 119). One of the reasons affecting her choice could have been for an alliance with the English (Townsend 119), as there was warfare between the colonists and Native Americans (Rountree 19). Pocahontas was kidnapped in 1613 (Price 148). When kidnapped, she was about seventeen or eighteen and was a hostage for twelve months, and naturally had to adapt to colonial life (Rountree 22). She was eventually taken from Jamestown to Henricus (Price 152). She was baptized in 1614 and took the name Rebecca (Rountree 23). She and Rolfe fell in love and married in 1614 (Rountree 22-23). Her marriage with Rolfe brought a period of peace from warfare ("April 5, 1614"). Or another source says, "Pocahontas's marriage symbolized the truce that ushered in this hopeful period, but it did not cause it" (Rountree 24). Peace of Pocahontas lasted five more years after her death (Allen

304).

The movies leave out how the ten-year-old Pocahontas was sent by Powhatan to "secure" the release of some Indian prisoners at Jamestown, at which point Smith wrote she was "the only Nonpariel [sic] of his [Powhatan's] Country" (qtd. in Townsend 69). She sometimes brought food on behalf of her father to starving Jamestown Residents ("April 5, 1614"), which made her valuable: "With her growing language skills, she became ever more powerful—more welcome at the fort, and more important to her father" (Townsend 71). Smith claimed that Pocahontas warned him of a plot against their lives, but Townsend says it isn't very likely: ". . . it is unlikely not only that Pocahontas fled through the night to warn her English friends but also that Powhatan seriously intended to kill Smith at this point" (Townsend 80). Whether true or not, these instances at least show her as more than a beautiful woman.

While *Pocahontas* portrays the Indians as intelligent and displays the tension, racism, and infringement of land, they faced *Pocahontas II* trivializes Indians and Pocahontas' accomplishments in England by presenting frivolous characters and events. The movie is extremely historically inaccurate, only the most pertinent instances relevant to the essay will be related. Although it doesn't excuse this movie's erroneous portrayal, Disney at least included a disclaimer in the credits that the movie is "a fictionalized account of Pocahontas' life in England" and gave directions how to "learn about her remarkable, true life story" [Raymond & Ellery, *Pocahontas II*]. In *Pocahontas II* she is amazed by London, runs all over dressed in indigenous clothing, and even climbs a tree to get a better view of the city (Raymond & Ellery, *Pocahontas II*). A woman hits her husband and says, "You mustn't stare, she's barely dressed" (Raymond & Ellery, *Pocahontas II*). In the movie, she charms the king and is successful at court until she stands up for animal rights by protesting the cruelty of bear-baiting and is subsequently arrested (Raymond & Ellery, *Pocahontas II*). After being rescued, Pocahontas returns to the King and with powerful words, ends up convincing him to stop a fictional war armada that was going to go to the New World, piloted by the first film's villain (Ratcliffe) (Raymond & Ellery, *Pocahontas II*). Then, she and Rolfe sail to the New World, presumably happily ever after, since they are in love and children cannot see their favorite T.V. character fail (Raymond & Ellery, *Pocahontas II*).

As previously mentioned, Pocahontas went to England as a wife and mother of one son. She was taken to England in hopes that by "parading her before royalty, clergy, and merchants, [she'd] attract even more money and colonists to Virginia" (Allen 281-282). Allen also notes: "Lady Rebecca had a good command of English, dressed attractively, comported herself with quiet dignity, and danced gracefully" (283). This image is clearly contradictory to the one Disney portrays. In London she showed "dignity and aplomb" (Rountree

25). She was an important poster girl: "Pocahontas, the converted daughter of a chief, was impressive evidence of the attractiveness of Virginia as an investment and of the founding's success as a missionary endeavor" (Rasmussen & Tilton).

Pocahontas is also denied credit for the historically powerful reprimand she gives Smith for failing in his duties to her father and her people. In *The New World*, her reunion with Smith in London is more like the meeting of two former lovers who can be friends and go their separate paths. Smith shows admiration for her: "'Her Ladyship'—who would have guessed it?" (Malick, *New World*). He asks her during the conversation, "You knew I had promise, didn't you?" to which she replies yes, and then expresses her belief he will find the Indies (Malick, *New World*). Subsequently he says, "I thought it was a dream, what we knew in the forest. It's the only truth" (Malick, *New World*). He declares before leaving, "It seems to me as if I were speaking to you for the first time" (Malick, *New World*). *Pocahontas II* also omits her reprimand, since at the end of the movie she has to choose between two men, whether to be with Smith or Rolfe (Raymond & Ellery, *Pocahontas II*). In reality, John Smith writes that she told him:

You did promise Powhatan what was yours should bee [*sic*] his, and he the like you; you called him father being in his land a stranger, and by the same reason so must I doe [*sic*] you... Were you not afraid to come into my fathers Countrie [*sic*], and caused feare [*sic*] in him and all his people (but mee [*sic*]) and feare [*sic*] you here I shall call you father; I tell you then I will, and you shall call mee [*sic*] childe, and so I will bee [*sic*] for ever and ever your Contrieman [*sic*]. They did tell us always you were dead and I knew no other till I came to Plimoth [*sic*]; yet Powhatan did command Uttamatomakkin to seeke [*sic*] you, and know the truth, because your Countriemen [*sic*] will lie much ("Government," 442).

This is a powerful speech left out of the movies. Historically, she was: "...clearly upbraiding Smith for dereliction of duty, for dealing dishonorably with Powhatan, the Great King and his father, to whom he had sworn loyalty. She is aware of the many instances of his duplicity, and rightly confronts him with her knowledge and her shame that he could act so" (Allen 293).

Without a lot of historical documentation, it is hard to know the real Pocahontas, especially when movies take away what little power she has. The late modern Native American author Paula Gunn Allen relates some seemingly fantastic yet empowering theories about Pocahontas in her book *Pocahontas: Medicine Woman, Spy, Entrepreneur, Diplomat*. While a bit confusing and complex, we can glean a powerful and independent

image of Pocahontas. Allen says of Pocahontas in her books "Dedication," "She was the first boarding school Indian, and the first to walk two paths in a balanced manner" (v). She argues that Pocahontas is not someone who came into history by "falling in love" (Allen 11). Pocahontas is imbued with power: "She was much more than a simple Indian maiden: she was an initiate and powerful practitioner of the Dream-Vision People, a shaman-priestess in modern terms" (Allen 136). She reveals that Pocahontas' name, Amonute, makes her "a Beloved Woman, shaman-priestess, sorcerer, adept of high degree" (Allen 18). For Allen, Pocahontas is the one who saves Smith: "As the Beloved Woman who possess the *powa*, deciding who would live and who would die, it was Pocahontas, not the priests or warriors or even Powhatan, the shaman-emperor, *mamanantowick*, who determined the fate of the tribe, reflecting the significant power women held in numerous Native American nations . . ." (Allen 50-51). Allen also reveals her as a "sacred spy and ceremonially empowered diplomat" (112). She believes Pocahontas was either "abducted" or else "colluded" or "orchestrated" her kidnapping (Allen 180). Rather than being a victim of her conversion and marriage, she planned "to gain the *manit powa* of the English and transfer it to her Powhatan medicine women and men" (Allen 145). In this portrayal, her marriage to John Rolfe was advantageous: "The tobacco produced from the union of the Powhatan and the English, medicine woman and alchemist, soon became the dominant variety distributed to a global market" (Allen 202). After marriage, she could "plant and harvest information" more and easily be an "intelligence agent." Allen even discusses the idea that Pocahontas was poisoned to death in England, an idea supported by Professor of Native American Studies Jack D. Forbes due to all the information she would have shared with the Powhatan Indians about the monarchy (Allen 298). In addition, Allen talks of a conspiracy idea, in which even Rolfe might be a suspect (299).

While Allen's facts can be questionable (in the book, she states opinions, makes guesses, or has claims appended to "I think" [Allen 118]), Allen also claims that the group that accompanied her to England-Uttamatamakin (who was a "council representative"), her half-sister, three servant Powhatan women, and four Powhatan men--was a "party of spies" who were "all highly skilled shamans, *quioccaska* and/or medicine people (i.e., priests and priestesses)" (Allen 272-273). Townsend supports a similar idea since she writes that Pocahontas and "several of her family members" went to England "as free agents intent on gathering information that might clarify" the tribe's "future course" (Townsend x). She writes, "This was a fact-finding mission more than a pleasure trip" (Townsend 137).

Pocahontas has so many dimensions since her death that it is possible for one to write a book about the injustice done to her image, whether it is as simple as a

stanza from the innocuous song Peggy Lee song "Fever" or as serious as when Neil Young sang: "I wish I was a trapper/ I would give a thousand pelts/ To sleep with Pocahontas/ And find out how she felt" (Price 4-5; qtd. in Howe & Bensimhon). As Rasmussen and Tilton write, "During the centuries since its creation... the Pocahontas narrative has so often been retold and embellished and so frequently adapted to contemporary issues that the actual, flesh-and-blood woman has become almost totally obscured by the burgeoning mythology. ("Pocahontas") From what little we learned from the various sources, it is clear that Pocahontas has value, dignity, and power, but this is often watered-down or lost when she is portrayed as a star-crossed lover or girl in need of a man to feel fulfilled. As a final thought, and an issue worthy of more exploration, this essay closes with a quote by Helen C. Rountree:

The story of a young woman firmly rooted in her own culture, held hostage by bellicose newcomers, forcibly and then willingly assimilated into their culture, killed by a mysterious disease, buried far from her homeland, and ultimately used by the dominant society as a symbol for the oppression of her own people is not only an authentic account of Pocahontas's experiences but is also emblematic of the histories of generations of native people. (27)

Glossary

Powa: "a kind of energy and paranormal ability that enables one to foresee events, heal the sick, human, animal, or plant (one, two or all, depending); teleport objects; locate lost people or objects; soul-walk; shape-shift; compel others, human or otherwise; produce healthy and plentiful crops; connect with the mystery, the manito aki, and various manito" (Allen 335).

Mamanantowick: "combination priest-prophet-medicine-person-shaman; great leader with these qualities" (Allen 334).

Manito aki: "the world or land of the spirits; implicit order" (Allen 334).

Tsenacommakah: "the communal lands and being, of the Powhatan people" (Allen 3).

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The Value of Religious Poetry: George Herbert and His Poetry

Kara Nelson
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Why should students read religious poetry? What can religious poetry offer students at a secular school? Arguably, it offers students a different way of looking at poetry and looking at humanity. When people think of poetry, they might often think of love poetry. But there is another aspect of love: love of God. Whether students are religious or not, spiritual poetry allows them to see the reflection of love between Him and a soul. It often illustrates a soul's longing for fulfillment and self-actualization, which for some people is only found in God. While his language is challenging, St. Augustine's *Confessions* can illustrate the concept of a soul longing for fulfillment and love, but not finding fulfillment in material pleasures:

To Carthage I came, where there sang all around me in my ears a cauldron of unholy loves. I loved not yet, yet I loved to love, and out of a deep-seated want, I hated myself for wanting not. I sought what I might love, in love with loving, and safety I hated, and a way without snares. For within me was a famine of that inward food, Thyself, my God . . . For this cause my soul was sickly and full of sores, it miserably cast itself forth, desiring to be scraped by the touch of objects of sense (Augustine 30).

For I bore about a shattered and bleeding soul, impatient of being borne by me, yet where to repose it, I found not. Not in calm groves, not in games and music, nor in fragrant spots, nor in curious banqueting, nor in the pleasures of the bed and the couch; nor (finally) in books of poesy, found it repose . . . To Thee, O Lord, it ought to have been raised, for Thee to lighten; I knew it; but neither could nor would; the more, since, when I thought of Thee, Thou wert not to me any solid or substantial thing (Augustine 52).

For Christians and non-Christians, religious poetry has much to offer, even if it is based on different ideas. Even T.S. Eliot supports the study of George Herbert: "It would, however, be a gross error to assume that Herbert's poems are of value only for Christians. These poems form a record of spiritual struggle which should touch the feeling, and enlarge the understanding of those readers also who hold no religious belief and find themselves unmoved by religious emotion" (19). As Mark Taylor writes, love poetry is a reflection of divine poetry (20). He explains this concept: "Therefore, in the original Platonic terms, secular love poetry is somehow

an imitation of divine poetry, or the subject of secular love poetry is somehow an imitation of God, and not an entity of a different order entirely" (Taylor 20). The question this essay poses is this: if the world's pleasures do not bring happiness, can God bring happiness? This is a question that might be answered by studying religious poetry.

In the seventeenth century, more scientific theories were coming into view, although old views were not yet thrown out, a factor influencing writers of the time ("Literature and Culture," 1349). During this time, there was a shift in poetry, so that poems were likely to be "short, concentrated, often witty poems," with a move towards "jagged rhythms of colloquial speech" ("Literature and Culture," 1355). One text stipulates that, "Johnson, Donne, and Herbert led this shift and also promoted a variety of 'new' genres . . ." ("Literature and Culture," 1355). Donne and Herbert are Metaphysical Poets, along with Andrew Marvell and Henry Vaughn ("A Brief Guide to Metaphysical Poets"). According to the Academy of American Poets, "This group of writers established meditation—based on the union of thought and feeling sought after in Jesuit Ignatian meditation—as a poetic mode" ("A Brief Guide to Metaphysical Poets").

Diana Benet noted, "Until fairly recently, most critics regarded George Herbert as John Donne's disciple and inferior" (133). But Herbert is actually important: "...few would deny that the author of *The Temple* is one of the major poets of the seventeenth century" (Benet 133). But T.S. Eliot points out the fact that "...even in anthologies he has for the most part been underrated (15)." Eliot also states: "The exquisite variations of form in the other poems of *The Temple* show a resourcefulness of invention which seems inexhaustible, and for which I know no parallel in English poetry" (31).

George Herbert was born in 1593 (Waugh vi). His father died in 1596, and already in college Herbert had poor health (Eliot 3-4). One interesting connection is that John Donne and Herbert's mother were friends (Eliot 7). At Trinity College Cambridge, Herbert was made a Fellow, which also required him to "take holy orders in the Church of England within 7 years," or else give up the fellowship (Eliot 9). He was interested in a government or court career (Eliot 9). But his court ambitions were effectively snuffed out by the deaths of two potential patrons and the death of King James I (Eliot 9). He was a member of Parliament for a short time ("George Herbert," 1706). Herbert was ordained a deacon in 1626 (Summers 34). The exact nature of his whereabouts from 1627 to 1629 is a bit shaky (Summers 34). He suffered poor health from 1626 to 1629 and was "tortured by the lack of purpose and meaning in his life" (Summers 45). In 1629, Herbert married Jane Danvers (Eliot 11). There are some gaps about his entrance into the priesthood (Benet 6). He had some hesitations, but in 1630 he was ordained a priest and tended to a small country parish in Bemerton, Wiltshire (George Herbert 1706). The next three years were full of charitable duties,

duties to his parish, and literary endeavors (Summers 35). Unfortunately, he died of consumption (Tuberculosis) when he was 40 years old (Eliot 11).

When releasing his poems to be sent to his friend Nicholas Ferrar, Herbert described his poetry as "a picture of the many spiritual conflicts that have passed betwixt God and my soul, before I could subject mine to the will of Jesus my master; in whose service I have now found perfect freedom" (Kershaw; Waugh v). He also instructed Ferrar to burn the poems if he did not believe they would be helpful to "some dejected poor soul" (Summers 84). *Herbert also wrote A Priest to the Temple, Or The Countrey [sic] Parson His Character and Rule of Holy Life* (Fish 14). He was down-to-earth, believing in sermons directed to his congregation that applied to all members (Eliot 13). Eliot stated: "That he was an exemplary parish priest, strict in his own observances and a loving and generous shepherd of his flock, there is ample testimony" (11).

When *The Temple* was published, it was popular, but in the 18th century it wasn't as highly valued, and Cowper called it "gothick [sic] and uncouth" (Eliot 10). Samuel Taylor Coleridge helped promote the estimation of Herbert, as seen in two of his personal letters (Eliot 10). Coleridge was "the first important critic who praised *The Temple* on literary grounds," although his letter and posthumous writings placed emphasis on the need for religious inclination to fully appreciate Herbert's poetry, which of course is not true (Summers 20-21). American author Ralph Waldo Emerson also said of Herbert's poetry: "So much piety was never married to so much wit" (qtd. in Summers 22). Moreover, his poems also influenced poets Christina Rossetti and Gerard Manley Hopkins (Summers 23).

Much literary criticism paints Herbert as a saintly person, at peace with his situation, but more contemporary criticism has come to see his poetry showing "restlessness" and as representative of a "poet of change and surprise" (Fish 1-5). However, Stanley Fish indicates that his poetry is "restless and secure at the same time" (5). T.S. Eliot makes note of his presumed saintliness:

"We are not to presume, however, that George Herbert was naturally of a meek and mild disposition. He was, on the contrary, somewhat haughty; proud of his decent and social position; and, like others of his family, of a quick temper. In his poems we can find ample evidence of his spiritual struggles, of self-examination and self-criticism, and of the cost at which he acquired godliness." (13)

Naturally, if someone dies and leaves a manuscript behind, there is a significant amount of mystery and interpretations. But readers cannot judge his poems autobiographically: "...it is impossible to know how closely the experiences of the speaker

parallel Herbert's own, these interpretations amount only to a theory" (Benet 198). Also, his poems are not in chronological order (Eliot 15). The idea that his poetry was based on "catechistical models" has also been proposed (Fish 52). Mark Taylor wrote: "All the poems in *The Temple* can be viewed as Herbert's attempts to make his own words approach the Word of God" (Taylor 2). Diana Benet said of his collection of poems: "*The Temple* is a symbolic record of the life of a Christian engaged in an intimate and personal relationship with God (32). She also maintains that Herbert's poems aren't "private" poems but serve a didactic function to readers (Benet 34-35). Whatever type of poems, they relay "the speaker's particular experience all praise God and enlighten the reader, encouraging him to turn to God in the different attitudes or for the different reasons indicated by the poems" (Benet 39). Finally, it was stated, "His poetry is a paraphrase for the soul, and beyond that, for the soul's union with God" (Taylor 117).

Eliot really stresses the importance of religion and religious ideals on Herbert's work, and even goes so far as to say that the only poet since Herbert's time to be so dedicated to God is Gerard Hopkins (19). When talking about Herbert's relation to Donne, one source noted: "Herbert's verse *is* the religious experience, not merely a vehicle that could be switched arbitrarily to other kinds of pursuit" (Taylor 10).

Eliot's words serve as a good disclaimer for readers of this essay: "We cannot judge Herbert, or savor fully his genius and his art, by any selection to be found in an anthology; we must study *The Temple* as a whole" (Eliot 15). Benet also maintained: "It is a commonplace that Herbert's poems complement one another . . . Only when these poems are linked with others and read together do their full meanings emerge" (70). Nevertheless, this essay will still try to do Herbert some justice even though only some of his poems are explored here.

The first poem for review is "The Altar" (Herbert 1707). The poem is shaped like an altar: "Herbert was profoundly influenced by the genre of the emblem, which typically associated mysterious but meaningful pictures and mottoes with explanatory text" ("George Herbert" 1707). Another source called this poem an example of a "hieroglyph," and the source quoted the definition as "'a figure, device, or sign having some hidden meaning; a secret or enigmatical symbol; an emblem'" (Summers 123). "The Altar" is one of his poems with the "paradox that, as the works of a Christian poet, his poems ought to give fit praise to God but cannot possibly do so . . ." ("George Herbert" 1707). This of course is an emblem poem that looks like an altar. It shows the reason the poems have been published, and it also illustrates how "God has commanded a continual sacrifice of praise and thanksgiving made from the broken and contrite heart (Summers 142). This poem portrays a speaker that wants to love and honor God although he is unworthy. He's offering "A broken ALTAR.../ Made of a heart, and

cemented with tears..." (Herbert 1707, lines 2-3). The poet says that God has made this and that not man, but only God could form a heart (Herbert 1707, lines 3-8). The poet praises God with his whole heart and says the heart will still praise God even if he fails to (Herbert 1707, lines 9-14). Still, he must ask for acceptance and blessings for this offering: "Oh let thy blessed sacrifice be mine / And sanctify this altar to be thine" (Herbert 1707, lines 15-16). The poem is comprised of sets of ten beats, then eight beats, then four beats, then eight beats, and then ten beats, all of which parallel the technical building and proportions of an altar. The poem also has some obscure Biblical allusions ("George Herbert" 1707). Looking at other interpretations, Benet said the heart "was an altar . . . only if God sanctified it for his use or habitation . . ." (Benet 45). Mark Taylor sees "'The Altar' as an altar of words, reflecting the Word that has superseded altars of stone" (35). He later notes: "'The Altar,' which argues for the Christian supplantation of altars of stone with altars of human heart, is itself an altar of words, corresponding to the revelation in the flesh of the word" (Taylor 62).

Another poem is "Redemption," which gives a new view on the Death of Christ (Herbert 1708). T.S. Eliot stated this is "one of the poems known to all readers of anthologies" (28). With the help of the footnotes supplied in the text, readers learn that the poem is a sonnet with the poet seeing himself as an unhappy tenant and God as a landlord, and the poet wants a new lease, which refers to the New Testament replacing the Old Testament (Herbert 1708). So the poet wants a new lease and goes to heaven, where he's told that the tenant is on earth acquiring land he purchased for no little cost (Herbert 1708, lines 1-8). Knowing of God's greatness, the poet looks for God on earth in great places, such as cities, gardens, and courts (Herbert 1708, lines 9-11). But then he finds him in an unexpected place--among "thieves and murderers" (Herbert 1708, line 12). God says, "'your suit is granted'" and then dies (Herbert 1708, line 14). This poem is interesting in the sense that it gives a more legalistic metaphor for the Redemption. In addition, the shortness of the poem provides a sense of journey; a journey to seek God and the implied shock of finding him with criminals, having a wish granted by him, and seeing him die.

In the full collection of his poetry, there is a long poem called "The Sacrifice," which tells Christ's perspective of His Passion from the Agony in the Garden up to His death. The poem is powerful and structured; with four lines to a stanza and repetition in each stanza of the question "Was grief ever like Mine?" except for twice when Herbert switches to the declaration, "Never was grief like mine" ("The Sacrifice"). Again, Herbert reminds readers of connections they might miss otherwise, for example, in Judas' hypocrisy:

For thirtie [sic] pence he did My death devise
Who at three hundred did the ointment prize,
Not half so sweet as My sweet sacrifice:
Was grief ever like Mine? ("The Sacrifice")

Herbert also points out the irony of Jesus' treatment: "Behold, they spit on Me in scornfull [sic] wise, / Who by My spittle gave the blinde [sic] man eies" (sic, "The Sacrifice"). Herbert also offers Jesus' reflection of those who mocked him to save himself, when Jesus says: "In healing not Myself there doth consist / All that salvation which ye now resist" ("The Sacrifice"). The poem is meant "to move the reader by showing human guilt and divine love in their clearest connection" (Benet 108-109).

Finally, the poem "Love (3)" really illustrates the unworthiness a soul may feel because of sin, and feelings of inadequacy. God forgives and accepts the sinner. Eliot states it "indicates the serenity finally attained by this proud and humble man" (34). It is one of Herbert's best-known poems, and it's "generally interpreted as picturing the soul's welcome to the Communion or to salvation on earth" (Summers 88). Still another thinks it's about the soul's acceptance into heaven (George Ryley, qtd. in Summers 89). Summers said, ". . . it gains immensely in richness when we recognize the relationships it establishes between this world and the next, between abstracted and incarnate Love" (89). Stanley Fish interpreted it as showing how the speaker "must approach and taste if his soul is to receive its proper food; but if he approaches in a state of sin he will eat and drink damnation (132). It also shows the speaker isn't worthy or unworthy but "declared worthy" (Fish 132). Finally, "The exercise of preparing to become worthy does not end in becoming worthy, but in the realization (stumbled upon again and again) that you never can be" (Fish 136). The poem shows a loving God and longing for love, the type of poem that one could imagine showing St. Augustine.

Thus it is evident that Herbert was very dedicated to his vocation and his poetry, which, although it is religious, offers us much to think about. We see a soul in search of God and struggling with acceptance. Again, this essay poses the question: if the world's pleasures do not bring happiness, can God bring happiness? For Herbert or people like St. Augustine, it seems like their happiness and peace are found in God. One source said: ". . . when we read his greatest poems we can only recognize with Rilke the immediate imperative of the greatest art: 'you must change your life.'" Religious poetry can give readers new ways of looking at their lives and searching for fulfillment. As a final thought, this essay concludes with a stanza from Herbert's poem "Discipline," which expresses what could be a universal truth of both divine and human love:

Then let wrath remove;
Love will do the deed:
For with love
Stony hearts will bleed. (Herbert 1724, 17-20)

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The Effects of Social Media on College Students

*Terri Pinyerd
English 100
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Distractions have always been a part of college life. From parties and movie nights to phone calls and emails, students have always found a way to unwind and connect with their peers. Not until social media burst into the mainstream did procrastination finally become a dangerous word. This paper will analyze the effects of social media on college students and their goals of higher education, exploring both the pros and cons of keeping up online.

The definition of social media is fluid and rapidly changing with the variety of sites available. One definition of social media is that of "a web-based service that allows individuals to: construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system" (Nguyen, 2013). Although this is a fairly accurate statement, every single person interviewed for this paper replied with the exact same answer: "Facebook."

To develop a background for just how widespread Facebook is in popularity there are a variety of statistics. Of the 500 million users that Facebook boasts, fifty percent log in every day, totaling to about 700 billion minutes per month spent logged in, scrolling down the news-feed and posting statuses. Forty-eight percent of 14-18 year olds stated that they check Facebook as soon as they wake up, twenty-eight percent of them doing so before they even get out of bed (Med. News, 2012). This desire to be in constant connection results in a generation that is more detached from the social and emotional aspects of reality. Face-to-face interaction is no longer necessary and although no studies have found a direct link between Facebook usage and depression, there have been noted cases of increased anxiety and apathy in adolescents (Jelenchick).

To gain a sense of how this directly affects education, a survey was created and distributed throughout a variety of classes on the University of Hawaii at Hilo Campus. The questions were as followed: (1) What is your age? (2) Which social media sites do you actively participate in using? (3) How many hours per day do you spend on each of these sites combined? (4) How would you say social media has affected your study habits? (5) How would you say social media has affected your personal/social life? (6) Can you comfortably go without social media sites for more than a day?

The age range of interest was that of the seventeen to twenty-two year olds. This provided data from a generation with adequate experience in both social media and higher education. Ninety-two percent

of survey takers were between the ages of seventeen and twenty-two, allowing for a convenient glimpse into the ideal age-range.

When asked how often they check in on social media sites, thirty-nine percent claimed an average of one to two hours per day, with the remainder noting that they logged in sporadically throughout the day. This correlates with another study by CourseSmart, a leading textbook company based in California. When interviewed, four in ten college students said that they could not go ten minutes without checking a mobile device (Zucker, 2011). In another on-campus study, interviewees said that Facebook was the first thing that they checked before studying, spending at least forty-five minutes of their time on social media sites (Dias, 2009). This data implies that social media sites, take slight precedence over academic pursuits when it comes to college students.

However, mere numbers do not always provide the most valuable information. For this survey, students were asked to summarize their insights and feelings toward social media, allowing for a more insightful result. When asked how they felt social media was affecting their study habits, fifty-three percent said that the effects were detrimental, while twenty-eight percent claimed that social media sites did not affect their study habits at all. Only fourteen percent referred to the benefits of social media, stating that it helped them with academic achievements and allowed them to access information for school-related projects. The effects of social media sites on the social/personal part of life were almost the exact opposite. Fifty percent were happy with the benefits; social media allowed them to keep in touch with family members and friends from back home, or to make new friends more easily than they would in face-to-face conversations. Seventy-eight percent of the one hundred survey takers answered "yes" to the final question: Can you comfortably go without social media sites for more than a day?

The more specific benefits and downsides of social media sites were also illuminated in this survey, based on side notes penned by some particularly eager survey takers. Aside from bridging the gap between old friends and family members back home, several individuals specifically stated that Tumblr has "helped define [my] style", while another said that Facebook allowed them to "ask classmates for help on homework" and "make connections with new friends". While not all of the benefits are purely academic, they do provide a creative outlet for many students to express themselves, allowing for a healthy mental and emotional well-being.

The ability to foster a healthy self-image is a strong factor amongst social media site users, and self-affirmation is a big part of sites such as Facebook and Instagram. Self-affirmation is defined as "the process of bringing to awareness essential aspects of the self-concept, such as values, meaningful relationships, and cherished personal characteristics" (Hancock). In other

words, many social media sites are a quick and easy way to receive compliments or flattery, which in turn boost a user's self esteem. As college is often a difficult transition for many students both freshman and upper classmen, an outlet of reassurance can be beneficial to their overall feelings towards academic life.

On the other hand, complaints of "social drama" and a lowered sense of self-esteem were reported. Users can choose what information they share with others, picking out only the most flattering photos, highlighting prime vacation experiences, and flaunting their relationships for their social circle to see. The "ugly" side of social media peers is rarely shown, and so it is assumed that their lives are better than one's own. Where one "like" can make your day, a snarky comment can ruin it. Emotional turmoil seems to be part of the package when it comes to these sites, therefore they must be used with caution.

On the other end of the social media spectrum are sites such as Tumblr, Instagram, Reddit, Imgur, YouTube, and Pinterest. As these sites are mostly video and image based, the small amount of contact between users is generated only through the comments section of the websites. Although negativity is always present, it is less of a threat than it is on Facebook. Comments from anonymous users who do not share a personal tie tend to have less of an emotional impact than comments of a similar nature from close friends or personal acquaintances. In fact, the general layout of image-based sites nurtures a more positive and stress-free environment, allowing users to relax, vent, and relate with one another from different sides of the globe, as many survey takers stated.

One clear example of this sense of community is on the popular site Imgur (pronounced "imager"). Imgur is a collection of the most viral and recent images in circulation on the Internet. In fact, the majority of the popular images you see everyday originate on Imgur. Upon creating an anonymous account, one can upload any image. Based on an "upvote/downvote" system of points the images either thrive in popularity or remain unseen by the majority of the site users. The most popular images receive "front-page" status, which grants a rank amongst the variety of images seen on the homepage of the site (Imgur). Negativity is rare on Imgur and arguments are often handled tastefully. The majority of posts are celebratory images whose subjects range from engagements to memorials to family outings and inspiring stories. This allows for a website that encourages relaxation and positive thinking – traits that Facebook may occasionally offer, but cannot guarantee.

It is within sites like these that the majority of the benefits of social media arise. When asked about the pros and cons of social media usage within the given survey, thirty-four percent of students stated that image-based sites such as Tumblr and Instagram give them daily inspiration and help them express themselves comfortably. On the other hand, the same percentage

of students also added that sites such as YouTube and Imgur encourage procrastination. After all, with multiple on-campus opportunities to gain access to computers and Internet connection, it is not very difficult to open up a webpage with of the most recent music video between studying for finals and writing an essay.

When asked how they regulate their Internet usage, the majority of students were seemingly speechless. Many stated that they simply turn off their electronic devices, while others admitted that they don't attempt Internet regulation at all. In the words of an anonymous survey taker, "Going on Tumblr helps me to relax when I'm stressing." Although it seems as though students may just be mindlessly procrastinating, data such as the previous quote provides an insight on patterns between students and social media that implies a subconscious type of self-preservation. In an attempt to calm them and conduct their required studying, students turn to online conversations, images, and videos as a mental and emotional crutch to cope with the constant pressure and stress of pursuing a higher level of education.

Multitasking is a key aspect of procrastination and many students have mastered it. While a small percentage of students claimed to actively participate in the usage of a single social media site, the majority (just over sixty percent) admitted to using two or more sites simultaneously. Based on a random selection of volunteers, it has been observed that the average combination of websites in use while a student studies follows as such: Facebook, an image-based site (mainly Tumblr and/or Imgur), a search-engine (such as Google or Bing), and a handful of miscellaneous websites based on the assignment at hand. Students claim that these social media or extracurricular sites help them take breaks while studying, and allow them to relax and release stress.

Based on the data at hand, it seems that there is no definite answer when it comes to the use of social media sites and their effect on college students. The majority of the data tends to sway on the side of the benefits (broadening of social circles, ability to branch out to new ideas) and the downsides are everyday life experiences whether or not you decide to check in on your favorite website for the day. The only common factor was that many users who reported strong benefits also logged in an average of one to two hours a day, maximum. This implies that regulating online time is an important part of healthy social media usage. As with any other indulgence, moderation is key.

The goal of college is to further your education, but distractions are inevitable. Social media brings with it new distractions – a way to forget about your surroundings, procrastinate, and lose track of time in a way that past generations would never have imagined. The Age of Information has created portals into the minds of one's peers. The benefits of social media outweigh the downsides only in specific cases, but overall it has become nothing more than a distraction – albeit a

seemingly welcoming one – to young adults trying to make their way through college.

In conclusion, the effects of social media on college students are mixed; with the good comes the bad and vice versa. While there are definite downsides (anxiety, procrastination, and lowered self-esteem,) there are also strong benefits (self-affirmation, stress release, and easier ways to communicate) and therefore, there are no definite rules about how social media should be handled. Only the ability to self-regulate the amount of time spent on these sites each day can determine the effects on the social and educational aspects of the life of the average college student. The issue is not the tool, but how the tool is used.

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From Liberation to Sexual Objectification and Violence: Chinese Women and the PRC

Matthew S. Therrien
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In 1949, twenty eight years after its founding, the Chinese Communist Party (CCP) established the People's Republic of China (PRC), officially ending more than 50 years of war, division and tumult with the promise of unity and equality. The formation of the PRC ushered in a historical departure for the Chinese people, who for most of their modern history had been ruled by an emperor or other embodiments of centralized and exclusive power, whose rule was divine and unquestionable due to the prevalence of Confucian hierarchy and ideologies. The freedoms and rights promised by the PRC served as a refreshing departure from a repetitive historical cycle of oppression and disempowerment. All of the citizens of China's extremely diverse and large population would benefit from the proposed Communist ideologies, but perhaps no group was to be more affected by the implementation of a system of heightened equality and empowerment than Chinese women. In the years leading up to the founding of the PRC, the CCP displayed a zealous rhetoric aimed at creating greater equality and rights for Chinese women; however, the ineffective attempts of the PRC to legislate equality was not effective. The economic reforms of the 1970s have also served to elevate levels of gender inequality in modern Chinese society as evidenced by the objectification of women through increases in prostitution and sexual violence rates.

Demystifying the Role of Women in Chinese History

In many ways, the history of China can be read as the history and development of Confucian principles; however, to apply this thinking to an analysis of the role of women in Chinese history is a grave oversimplification.

There is evidence to suggest that in Early China, prior to the Shang Dynasty (1600 BCE), portions of China were matriarchal and even matrilineal. Modern examples of matriarchal Chinese ethnic minorities, particularly in Southeast China, such as the Mosuo and Lahu people exist as a legacy of an Ancient China that was more pluralistic in terms of sex and gender. Although specific examples exist, they highlight regional and local exceptions, not necessarily the rules governing society as a whole. Divining information regarding ancient practices and traditions—not to mention a singular social perception of gender roles—is a daunting anthropological task; however, early religious texts and practices offer the most accurate and complete portrait of the perception of women in Ancient China.

Prior to Confucianism, Chinese life was governed widely by prevailing indigenous and animistic spiritual beliefs. The Mosuo people of Southwestern China worshipped a female deity and this image of the mother goddess had a direct social impact within the sexual and social freedom of Mosuo women (Du 254). Similarly, the divinity of male-female unity established by indigenous mythology and cosmology of China's Lahu minority influenced that society to adopt a "world view...organized around the principle of gender-unity" (Du 256). While these examples provide a limited view of female sex and gender in Ancient China, research does demonstrate the importance of religious ideology in shaping the position of women within the context of any given culture or tradition (Du 253). In pre-Confucian China, the most widely followed organized religion was Taoism and examples of societal views on the position of women can be found within Taoist tradition and thought. In the early 4th and 3rd century B.C., Taoism emerged as a formal religion born from an exchange between and unification of localized indigenous religions (Verellen 328). In Taoism, like many of the indigenous religions it assimilated, the union of masculine and feminine is an important concept in achieving individual balance and harmony. The *Tao Te Ching*, regarded as Taoism's essential text, encourages practitioners to "know the masculine, but keep to the feminine." (Lao-Tzu 27).

The rise and eventual establishment of Confucian ideology as the basis for Chinese life in the Han Dynasty is the definitive factor in the holistic transformation of China from a society with a pluralistic view of sex/gender unity and equality to a pure patriarchy. The establishment of Confucian ideologies, in combination with an ever-tightening application of Confucian morality to the subordination of women, is the basis for the concept of the Chinese patriarchy that we know today. The most indicative of the many moral and social nuances that influenced the Chinese perception of women is the expectation of women to uphold the three subordinates: to her father before marriage, to her husband after marriage, and to her son after her husband dies. It was during this period in Chinese history that the importance of women began to immediately be minimized in relation to men. The decline in women's rights and position culminated with the establishment of the Tang and Song Dynasties. It was during these dynasties that the practice of foot binding became prominent. Thus, the near complete social subjugation of Chinese women was manifested in the physical act of limiting the mobility and independence of Chinese women. It was not until the Qing Dynasty, that women began to experience a degree of reprieve and an increased level of freedom, especially in terms of educational access. The Qing rulers of the 18th century sought a revitalization of education (Spence 223). The renewed sense of education's importance to the Chinese state, brought about an increasing desire and willingness for women to participate in education

and the first official Girl's School was opened on May 31st, 1898 (Qian 401). The abolishment of the centuries old practice of foot binding also served to demonstrate a move towards women's rights. The re-emergence of concepts of sex/gender equality during the reforms of the mid 1890s gave Chinese women a sense of purpose and possibility and a desire for a voice (Spence).

Women in Early Communist China: The Rhetoric of Change

The desire of Chinese women for an expanded societal role and position, fostered during the decline of the Qing, perfectly set the stage for early inclusion of women's issues within the Chinese Communist Party (CCP). In 1921, the founding of the CCP provided an essential outlet for women to work towards a society and government that zealously defended their rights (Spence 290-311). The Party's objective of eliminating the existing systems of hierarchical oppression included that of overthrowing the patriarchy.

Examples of zealous gender rhetoric were utilized early and echoed often. Party leaders—most notably Mao Zedong, through his writings on women and Chinese society in Changsha newspapers in 1911—provided individual assertions of CCP's philosophy concerning women (Spence 294). More than individual party philosophy, the language of sex/gender equality and liberation was actively promoted as a reflection of the CCP as a whole:

“The misery that Chinese Women have suffered for thousands of years has now reached a limit. The Trammels of a patriarchal social system and oppression by imperialism and its tools... have kept women from achieving political and economic independence and have literally made them into commodities, playthings, parasites...”
(Hong 1)

The energy and passion with which the CCP supported the issues of women's rights was instrumental in the ascension of the CCP as a grassroots movement, with women being actively involved in the establishment of underground communication and information networks.

With the formation of the PRC in 1949, the newly mandated socialist government of the Chinese people was tasked with matching the rhetoric of women's rights with governance, a task that the First Plenary Session of the Chinese People's Political Consultative Conference (69 women were present at the conference, accounting for 10.4 percent of delegates) pursued immediately when it was convened in Beijing (Rosen 316).

Legislating Equality: De Jure Fallibility

The PRC established gender equality as an immediate legal priority as reflected in article 6 of the Common Program of the Chinese People's Political Consultative Conference — From the first plenary session

of the Chinese People's PCC, September 9th, 1949:

“The People's Republic of China shall abolish the feudal system which holds women in bondage. Women shall enjoy equal rights with men in political, economic, cultural, educational and social life. Freedom of marriage for men and women shall be put into effect” (Shanshan).

The strong declaration of commitment to women, by the PRC's first governing body, was followed by a number of laws intended to further establish a sense of equality.

The first of these legal measures was the Marriage law of 1950. From a purely pragmatic analysis, the Marriage Law of 1950 was a document composed of 27 articles that aimed to establish a legal system for the contraction and dissolution of marriage. From the CCP promoted social standpoint, the law sought to create measures and equal recourse for women and men to dissolve a marriage that was deemed mutually unsalvageable (Diamant 173).

In 1954, the newly ratified Constitution of the People's Republic of China emphasized the objectives of the First Plenary PCC by restating the principles of the equality and protection of women in Article 96: “Women in the People's Republic of China enjoy equal rights with men in all spheres of political, economic, cultural, social, and domestic life” (Constitution of the People's Republic of China).

Despite the immediacy and the strength of the language injected into these legal statements, it is important to understand the de facto reality of Western concepts of law in China. Historically, from the introduction of Western concepts of law to China during the Qing dynasty, there has been a preference for “rule by internalized morality to rule by law” (Ruskola 2532). Essentially, the tradition of Confucian morality has had lingering effects on the way in which law is viewed within Chinese society, relegating it in status to “a secondary form of social control.” Such idealistic presuppositions of law render the concrete social aspect of law as completely ineffectual state apparatus (Ruskola 2532).

Beyond the underlying cultural misalignment of Western legal conceits within the PRC model, were the all-encompassing nature of Maoist reforms and the agents of the Communist Party. Under Mao's leadership, the rule of state played a subordinate role to the rule of Mao.

The Casualties of Change: De Facto Representations

It is convenient to view the reality for women in today's modern China as a vast improvement from a historical legacy of foot binding and concubines. It is undeniable that there are countless women who have benefited from the movements and reforms of Mao Zedong and Deng Xiaoping. The economic reforms of the 1970s brought China to the forefront of the world

stage as an economic and political superpower. While the elevation of the Chinese state through economic reform is undeniable, the devaluation and objectification of women—as shown through the development of the sex trade and increase in sexual violence—in the wake of those reforms is equally undeniable.

Prostitution has existed at some level and with varying degrees of governmental acknowledgement—even so far as being taxed and regulated during the Song Dynasty—throughout the course of Chinese history (Cao and Sacks 532). The first contemporary/modern acknowledgement and subsequent action taken to end prostitution occurred during the formation of the Republic of China under the Nationalist government in 1911 (Cao, et al. 532). The Nationalists understood the problems posed by prostitution and attempted to mitigate its prevalence by enacting a ban in 1929 (Ebenstein and Sharygin 3). The act was intended to garner support through the championing of the rights of oppressed Chinese women, however, the political tumult of the ensuing years rendered enforcement unachievable.

With the ascent of the PRC, true ideological, moral, social and legal opposition to the ideals of prostitution emerged, leading to a sharp decline in prostitution rates. Under the totalitarian leadership of Mao and his regime, the sex trade was almost entirely neutralized in the 1960s (Ebenstein, et al. 3). In 1979, the Criminal Law of the PRC made the forcing and luring of women into prostitution illegal (Ruskola 2257).

The objectification of women has increased exponentially since Deng Xiaoping's economic reforms in line with socio-economic developmental trends. Although exact figures are hard to discern, 2010 estimates place the number of "active" sex workers between 3 million (estimated by the PRC) and 10 million (as estimated by the US) (Ebenstein, et al. 4). The number may seem insignificant in relation to the total population of the PRC; however, those numbers represent a very conservative estimate of a small demographic of "professional" sex workers. Official statistics representing all Chinese women engaged in monetary sexual transactions are unavailable, but those numbers could be as high as 20 million women (Ebenstein et. al. 4). In terms of financial valuation, the estimated value of the sex trade in China is roughly \$73 Billion a year, the most of any country by far, outpacing the next country, Spain, by almost three times (Jinghao).

Specific examples of the startling trends in prostitution rates can be found in more localized information. Official records show that Canton in 1979—the year after Deng Xiaoping's reforms—only 49 pimps, prostitutes, and customers were caught (Ren 1413). In 1985, this number had increased to approximately 2,000. In one month of 1987, 11,946 participants in the sex trade were caught (Ren 1413). Official Chinese arrest records of prostitutes reveals a 260% increase from 11,500 total arrests in 1982 to 246,000 total arrests in 1993 (Ren 1414).

The history and prevalence of sexual violence against women in China is not as easily definable as the history of prostitution, however, the limited data and statistics indicate that the occurrence of acts of sexual violence are increasing, while the willingness to report acts of sexual violence are decreasing. In the 1990s, the incidence of rape and sexual assault cases grew at a staggering rate as evidenced in this data from Hong Kong, from 800 in 1981 to 12,500 in 1998. It is also important to note that 1998 is the year after the PRC reclaimed Hong Kong (Chan 18).

The most frightening statistics, however, are those demonstrating a decrease in reporting incidents of rape and sexual assault. From 2000 to 2004, Hong Kong police documented annual unreported cases of rape at twice the amount of reported cases (Chan 17). From 1993 to 2002 Hong Kong Police saw reported rates of rape remain neutral at around 100 reported cases of rape per year. Data from the Association Concerning Sexual Violence Against Women shows that rape cases increased from 27 in 1997 to 191 in 2001 (Chan 18).

The objectification of women in China is not isolated to the sexually transgressed acts of engaging in the sex trade or sexual violence. The increased social and economic competitiveness brought forth by the economic modernization of China places value on women in relation to youth and beauty that impact the these women in every possible setting—not just the brothel or the dark alley (Ren 1425). The entrance into and mobility of women within the workforce—one of the true highlights of PRC governance—is increasingly becoming a tool to objectify women. It is not uncommon to see Chinese businesses post advertisements for open positions "...specifically to solicit for single, beautiful women younger than 25 years old" (Ren 1425). It is not hard to imagine the continuous sexual pressure and coercion that these women face within the work place. Chinese society, increasingly motivated by the competitiveness and materiality of consumerist culture, is beginning to apply a standard of valuation and worth on the women in its society.

Implications for the Future

Perhaps the greatest concern facing Chinese women in the future is the unavoidable fact that more and more Chinese men will be unable to marry due to the damaging effects of the One Child Policy. By 2020, China is expected to have 24 million men who are unable to marry due to the gender imbalance that is just now becoming an issue (Ebenstein, et al. 9). The impact that this will have on the demand for the sex trade in China is yet to be seen, however, it is very likely that recent trends will continue and potentially worsen. China's literal gender imbalance is a stark contrast with the figurative harmony and balance embodied by the Yin and Yang.

As Chinese hurtles into the future, the fate of Chinese women is uncertain. During the sixty-four years that the PRC has led China, women have seen increased access to education and work. They have seen their rights defended, defined and protected by law. They now hold roles in government, business and academia, and are undeniably responsible for much of China's modern successes; however, for increasing numbers of Chinese women, those successes are coming at an unimaginable cost.

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History Unchained: The (DE)Evolution of the Slave Narrative from Frederick Douglass to *Django*

By Matthew S. Therrien
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Amongst the many historical atrocities committed by the United States of America, few have had the scope of impact on the landscape of our country as the creation and implementation of the chattel slave system. As with most historical traumas, the institution of slavery and the damaging effects of that system have remained a consistent fixture in the storytelling traditions of our country; however, the interpretation of that trauma has remained far less static. This paper will focus on the ways in which the narrative depiction of the institution of slavery has changed and the impact of that change on our perception of the historical event. Do modern reinterpretations of the American slave experience serve to maintain a continuous dialogue regarding historically traumatic experiences, or do these interpretations serve to dilute the historical by undermining more traditional slave narratives? This research will focus on two slave narratives, 1845's *Narrative of the Life of Frederick Douglass, An American Slave* by Frederick Douglass and 2012's *Django Unchained* and examine the similarities and differences in their depictions of the institution of slavery, as well as how that depiction is impacted by the audience and intent. While the narratives may serve different societal functions, it is also important to analyze the ways in which each narrative permeates societal consciousness.

No completely accurate depiction of the American chattel slavery system will ever exist, however, the conditions that differentiated the American colonial slave system from other historical forms of slavery are widely agreed upon. While versions of slavery had existed throughout human history, the chattel slave system was unique in its coordination of three distinctive components: (1) the degradation of the individual through complete dehumanization (2) the classification of slavery and imposition of degradation based on a defined concept of race and (3) the inheritability of the condition of slavery matrilineally.

When the *Narrative of the Life of Frederick Douglass, an American Slave* was published in 1845, it not only shocked audiences in its descriptions of the institution of slavery, but also in the eloquence and intelligence demonstrated by its author, himself a former slave. For many Americans, the concept of black intellect was completely new and Douglass' narrative was an impressive rebuttal of the very foundations of inferiority that the institution of slavery was built upon.

One of the most important components to consider when examining Frederick Douglass' narrative is the audience for whom he was writing. While Douglass' narrative served to portray the slave experience, the book was indisputably written for a specifically white audience. More than being written for a white audience, however, slave narratives of the 1800s "were, to a large extent, propagated by abolitionists who edited, promoted and distributed them" (Nichols 149). In the case of Douglass' narrative, the intended audience was white, intellectual Northerners, whose inaction was a byproduct of cognitive dissonance and whose own self-value would not be threatened by the rise of a black intellectual class.

The unavoidable consequence is that Douglass' work adopts a white literary aesthetic. Douglass chose "to write for his audience using educated white English in order to reach and influence the widest audience possible, the audience that might be able to act on his and other slaves' behalf" (Raybourn 30). Regardless of his adoption of the societal master language, the intent behind Douglass' narrative was to educate the white Northerners on the conditions of slavery (Raybourn 34). For many Americans, the concept of black intellect was completely new and Douglass' narrative was an impressive rebuttal of the very foundations of inferiority that the institution of slavery was built upon.

By the mid 1800s, there was little to no economic incentive for Northern Whites to continue to support the slave system (Nichols 155), however, the vast majority lacked any motivation to act because slavery had become an accepted, even expected, institution. The significance of Douglass' narrative "to Americans who lived a century ago, and their importance today, lies in the attitudes which they bred in their readers. The narratives present full and, for the most part, reliable facts about slavery" (Nichols).

Beyond humanizing blacks through his own ability to navigate white language, Douglass was able to humanize them through the substantive depictions of community within the slave system. Even within the most dehumanizing of conditions, Douglass is able to eloquently articulate the relationships that he was able to develop with his slave brothers and sisters. While at the Freeland plantation, Douglass expounds the depth of the relationships that he is able to develop, how the shared experience allowed them to become "linked and interlinked with each other...with a love stronger than any thing I have experienced since" (Douglass 2212). In fact, the community that Douglass describes is one that is more inclusive and united than most free communities: "We never moved separately. We were one;" (Douglass 2212). These recognizable components of social structure and human interaction within black slave communities helped to dispel the myths of the inferiority of blacks and thus, the justification for their enslavement.

Historical proximity to the event has not dimmed our fascination with creating narratives depicting slavery; foremost amongst these contemporary interpretations is *Django Unchained*, a 2012 film by controversial director and auteur Quentin Tarantino. While early crafters of slave narratives, like Frederick Douglass, were limited by a society that was less diverse and governed by more overtly racialized social constructs, Tarantino's work was released to an increasingly diverse and multifaceted American audience that had even elected its first mixed race President, Barack Obama.

In examining Tarantino's depiction of the slave narrative, it is important to understand the film as first and foremost the work of an auteur, intended for a broad audience with some knowledge of the existence of the institution of slavery. Within this context of entertainment before education, the film successfully presents a unique reimagining of slavery and expands the role of the black man within that system; however, the film was met with a great deal of controversy by respected members of the black community. Foremost amongst these leaders was the black filmmaker, Spike Lee, calling for a boycott of the film by black audiences because he felt the premise of the movie was disrespectful to blacks and their ancestors (Seymour).

While Quentin Tarantino's film, takes a more modern—and artistically liberal—approach to depicting the slave experience, it also covers a breadth of incredibly complex and important nuances within the slave system, including the sowing of tension within the ranks of the slave, division between house and field slaves, the justification of slavery through eugenics, the complicated sexual relationship between white men and black slave women (Cobb), however, most of these issues are presented more than they are explored historically. And therein lies the main controversy of the film.

While there are elements within *Django Unchained* that have great historical and academic value, these pieces are framed within a wholly unrealistic revenge narrative that while eliciting cheers from the crowd, is a superficial depiction of empowerment through violence, which could not be further from historical reality. This is not to minimize the importance of historical attempts, most notably by John Brown in 1859 and Nat Turner in 1831 (Reidy), to arm slaves in rebellion against the system of their oppression, however, it is irresponsible to ignore the consequences for those who were involved in these failed uprisings. In both of those historical examples, the leaders were executed and made examples. Only in a Hollywood reimagining of the Plantation Era South, can the character of Django—even as a free black man—whip a white overseer and be immediately punished for subverting the racial hierarchy upon which the entire institution of slavery thrived.

The entertainment value of *Django Unchained* is undeniable, especially for those who have suffered at the hands of oppressive institutions that continue to impose upon the rights of minority citizens in this

country. The movie, however, does so at the fringe of fantasy, sacrificing a realistic portrayal of the slave system for thrills and a Hollywood ending. The real question is: does the movie, director, or entertainments in general, owe any debt to the historically traumatic experience of slavery? Does revising history, even in such a blatantly inaccurate way, serve to detract from the reality of the black American experience?

Without the right context, yes. If Douglass and his contemporaries suffered from sentimentality, modern filmmakers suffer from extreme portrayals as well. The line between Beecher Stowe's unrealistically kowtowed and Christ-like Tom and Tarantino's violently liberated *Django* needs to be explored and depicted more within the narrative of the black experience if the identity of that community can be viewed less in the reductive binaries of post-colonial theorists, who posit that the only space allowed for the colonial subject is as "both savage (cannibal)" and "the most obedient and dignified servants" (Bhabha 68) and more through the lens of complexity and nuance.

Both narratives provide an important analysis of the American chattel slave system, however, the presentation within *Django Unchained* requires a broader context for its historical value to become apparent. While the institution of slavery has been formally abolished, the effects of slavery are still omnipresent for the black community. It is this concept of an inheritable psychological trauma within the black community that Dr. Joy DeGruy has extensively researched, written about and termed "Post-Traumatic Slave Syndrome" (P.T.S.S) in her 2005 book of the same name. Dr. DeGruy posits that P.T.S.S. is:

"A theory that explains the etiology of many of the adaptive survival behaviors in African American communities throughout the United States and the Diaspora. It is a condition that exists as a consequence of multigenerational oppression of Africans and their descendants resulting from centuries of chattel slavery. A form of slavery, which was predicated on the belief that African Americans were inherently/genetically inferior to whites. This was then followed by institutionalized racism, which continues to perpetuate injury." (DeGruy)

It is for this reason, because the institutional oppression born out of the same ideology, as chattel slavery still remains that the narrative depiction within *Django* has the potential to damage the black community. The violent resistance depicted in *Django* departs from the physical resistance depicted in Frederick Douglass' narrative, instead favoring a reductive revenge fantasy over the more concrete act of empowerment.

In both narratives, violence is a side effect of oppression; yet, it does not solve any of the true problems of the oppressive institutions. It is nothing more than a

hollow attempt to reclaim recognition by any means possible. Douglass' isolated act of violent resistance against the slave breaker, Mr. Covey serves to empower him with self-confidence beyond the act of violence: "It rekindled the few expiring embers of freedom, and revived within me a sense of my own manhood. It recalled the departed self-confidence" (Douglass 2207). Inversely, Django's consistent return to violence comes to define him, to typify him as a one-dimensional embodiment of black revenge.

Frederick Douglass' narrative is rooted in history and the direct experience of the trauma it is depicting, while Tarantino's contemporary depiction is rooted in a fantasy that incorporates important concepts of race and history within the construction of something unreal. Like the character depicted in the movie, *Django* offers an essential modern narrative of empowerment and overcoming oppression, however, it is important to consider it within the proper contemporary context. As a stand alone, *Django* can be a dangerous challenge to the horrifying realities of the slave system, however, in concert with other slave narratives including that by Douglass, it does serve an important function in exploring sociological issues within the context of slavery and more importantly, within the context of our own society today. Frederick Douglass' narrative is rooted in history and the direct experience of the trauma it is depicting. Tarantino's depiction is rooted in a fantasy that incorporates important concepts of race and history within the construction of something unreal.

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Sketching Yellow Picket Fences: Graphic Novels and the Sexualization of the Asian-American Dream

Matthew S. Therrien
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There is an image of the American Dream that is painted in our minds and reflected in the social environment of our country as the promise of upward mobility. Through hard work, perseverance and unrelenting faith in a shared equality, all Americans—despite the myriad of differences that divide us—are encouraged to adopt this collective image; to allow it to seduce us and propel us forward, towards the two-story house flanked by trees and a sprawling yard, symbolically surrounded by the white picket fence. As strongly as this material, economically motivated image manifests itself in our minds, so too does the social, static image of who resides here: the handsome, white news anchor handsome white man, his Stepford wife and the archetypal children represented by Dick and Jane. Regardless of our race, ethnicity or sexual identity, we have all become enchanted by this image of the American Dream. We ask to measure our successes and ourselves against it, regardless of whether our relationship to it has ever been depicted.

Yet, there is an inherent tension in the presentation of a static American Dream that is meant for everyone, but dangles just beyond reach for many (Coles 36). Foremost amongst those social minorities for whom the American Dream seems to be tantalizingly close are Asian-Americans, whose social and economic success has simultaneously elevated them as model minorities, while subsequently leaving them alienated: neither black nor white, but instead a non-distinguishable hybrid (Ho 30). It is due to the ambiguity created within this hybridity that has led Asian Americans, more than any other group of hyphenated Americans to be intentionally excluded from visual inclusion within the media's depiction of the American Dream.

This is not to say that Asian-Americans have not penetrated social consciousness Asian-American woman have enjoyed—for better or for worse—visibility within the media's depiction of the American Dream; however, it is often in a role that exploits the Asian-American woman as a combination of exotic and sexual traits in the form of caricatures (Ho 21). It is due to the prevalence of these hyper-feminine caricatures of Asian-American women and the invisibility of Asian-American men that has led to a universal application of femininity to the Asian-American community as a whole (Ho 21).

Despite the dearth of Asian-American males within the narrative depiction of the American Dream,

the community has recently found a niche within the medium of the graphic novel. In an impressive repurposing of a medium that has historically vilified the Asian-American community and served as a reference point for the location and reinforcement of stereotypes, the community has increasingly employed the graphic novel as a means through which to explore contemporary social issues and tensions inherent within the pursuit of the American Dream by Asian-American men (Dong 80). An exploration of graphic narratives and the reclamation of the Asian-American narrative by Asian-American males represented by this body of work, presents an excellent insight into how the American Dream is being navigated in this community, as well as the social and cultural impact of that navigation.

Amongst the offerings by Asian-American male writers, two works — *American Born Chinese (ABC)*, by Gene Luen Yang, and *Shortcomings*, by Adrian Tomine— stand out in their exploration of race and sexuality. Throughout the course of these narratives, the central character, an Asian-American male, participates in the sexualization of the American Dream by pursuing the feminine embodiment of this concept in the form of the “white” woman. In combination, these two pieces serve as an excellent holistic representation of the internalization of this sexualization from adolescence to adulthood, while also demonstrating the way that this motivation develops from a subtle preference into a deeply internalized response.

In *ABC*, Gene Luen Yang is able to effectively navigate internalized inferiority, whitewashing, assimilation, and ethnic dissonance in combination with the more universally relatable context of adolescent alienation and identity. The narrative of *ABC* masterfully weaves three seemingly disconnected story lines to an exceptionally inventive climax and resolution. Throughout the divergent narratives there exists a very relatable trope of adolescent sexual tension, first explored when Jin Wang is struck with the spontaneous arrival of sexual awareness in the form of his white classmate Amelia Harris and the transformative nature of that arrival: “life was never quite the same” (Yang 87). While the theme of adolescent sexual arrival and awareness is one that is common within the narrative structure of the bildungsroman, there is a socio-racial context that needs to be considered in Jin Wang's placement of his sexual desire.

The fact that the object of his affection is white is not arbitrary. Instead, it is a reaction to an internalized sense of racial rejection that is foreshadowed at an earlier point in the narrative, when a young Jin Wang moves to a new suburban school: “The only other Asian in my class was Suzy Nakamura...we avoided each other as much as possible” (Yang 31). This internalized rejection is reinforced later in Jin Wang's initially violent resistance — “something made me want to beat him up” — to the arrival of a new Taiwanese student, Wei-Chen Sun (Yang 37).

Having developed a pattern of resisting alignment with the marginalized culture to which he belongs, Jin Wang's choice to pursue Amelia Harris is not surprising. And while Jin Wang and Wei-Chen are eventually able to become friends, his rejection of Suzy Nakamura — first, as a friend and later as the object of his desire — leaves her socially, sexually and racially isolated. It is the combination of her gender and race and the threat of pairing — Asian man with Asian woman — that is represented by her, that is at the heart of Jin Wang's rejection (Yang 31). The possibility of being paired with Suzy Nakamura threatens Jin Wang because it completely transgresses the image of the American Dream that he has come to mentally adopt and physically aspire to represent through actions as subtle as perming his hair and more overt in his pursuit of Amelia Harris (Yang 98). It is an image of social acceptance that is attainable only through the promise of white marriage, white sexual recognition and the legacy of a passably white child that Amelia represents (Yang 177).

If *ABC* layers issues of Asian-American identity and sexuality within universally relatable themes such as adolescence and alienation, *Shortcomings* presents these same issues with absolutely no layering and pretense: it is a purely Asian-American narrative. In this capacity, *Shortcomings* is a perfect companion piece to *ABC* because it serves as a developmental continuation — even maturation — of the themes presented in Yang's piece. The internal conflicts that are introduced in *ABC*, through the character of Jin Wang, are fully realized in the central character of *Shortcomings*: Ben Tanaka.

Tomine's exploration begins by establishing Ben's rejection of Asian-American culture through his dismissal of an Asian-American film as "garbage" that only receives attention "because it was made by some Chinese girl from Oakland" (Tomine 13). Ben's rejection of Asian-American culture reflects his acceptance of a static vision of the American Dream that avails itself to all. By dismissing his cultural identity, Ben hopes to fully gain inclusion within American society, but it is this goal of assimilation that has led Ben to internalize the stereotypes of Asian-American males, instead of recognizing them as indicative of his inability to fully realize the American Dream.

This internal tension and the external manifestations that it produces are most evident in Ben's relationship with women. Ben has accepted an Asian-American woman, Miko, as a partner; however, the fact that Miko not only strongly embraces her own Asian-American identity, but actively participates in the elevation of Asian-American culture poses a threat to the cognitive dissonance that Ben has encapsulated his world view in. Ben resents Miko's engagement in "community...political...whatever..." and views her embrace of Asian-American identity as "clouded" judgment (Tomine 14). His resentment is also represented in his sexual rejection of Miko — and more broadly, Asian women — as capable of fulfilling his needs, while

in reality this rejection is grounded in his preoccupation with sexually pursuing the American Dream.

Just as Ben's rejection of Asian-American culture is evident in his rejection of Miko, it is also evident in the strength of his sexual attraction to the "typical western media beauty ideal" embodied by white women and perpetuated visually in the American Dream (Tomine 29). The depth of Ben's physical attraction is first exposed in the homogenous nature of his porn collection (Tomine 28), however, it is only after being confronted by Miko regarding the racial bias inherent within his choice of pornography that Ben attempts to dismiss his preference as "idealizing what I [he] couldn't have" (Tomine 86). In trying to dismiss his desire as a superficial and unattainable fantasy, Ben uncovers the true roots of his inferior self-image and the internalized stereotypes that conform that image.

Ben's desire is much larger than the superficial sexual fantasy that he attempts to distract himself with. Upon consummating the physical act of sex with a white woman — Sasha Lenz — it quickly becomes apparent that the sex itself is only one part of a much larger objective of social recognition that Ben is pursuing. He takes pride in the social visibility that he perceives being seen with a white woman. The so-called "white-girl envy" that he projects onto other Asian-Americans males reflects the way he views himself, as having a greater social value due to his relationship with a white woman (Tomine 68). Ben's idealized relationship ends very quickly, and with it, the social capital that he felt the relationship lent him. In the end, Ben comes up short — not sexually, but socially — as he realizes that his preoccupation with the promise of inclusion within white America's Dream has led to his complete exclusion from his own.

Ben Tanaka wholly embodies the confusion and internalization of sexual and racial identity for Asian-American men in America. Just like Jin Wang, he attempts to resolve these complex issues by rejecting Asian-American identity, including Asian-American women, in favor of a static American Dream promised through social and sexual connections with white women. The literary exploration of these concepts, by Yang and Tomine, reflects a very real tension in the Asian-American community.

While the demasculinization of Asian-American men is an exceptionally important and deeply troubling social reality, it has been wrongfully associated with the ability of the Asian-American woman to access the idealized American Dream through access to white men. Asian-American men are far too willing to allow the blame to be placed on the women in their community, when the true issue lies in the way that Asian-American men have internalized the idea of sexual inferiority. This is perhaps most poignantly reflected in the thinly veiled insecurity that Ben Tanaka attempts to pass off as a joke: "What's the main difference between Asian and Caucasian men? ...The Cauc" (Tomine 57). Unfortunately, like Ben Tanaka, many Asian-American

men have accepted the message in this joke to be reflective of reality.

It is this internalization of sexual inadequacy that Asian-American men allow to impact the social valuation that they attribute to themselves. Although this may seem to be an illogical progression, the post-colonial socio-racial theory of Frantz Fanon proposed in *Black Skin, White Masks* seems to support the development of such self-limited thinking. While Fanon's subject within the piece is the black male, the application can and should be expanded to the collective colonial experience of social minorities. Fanon poignantly illustrates the level to which the sexual and the social become unified within the relationship of the man of color with the white woman:

"I wish to be acknowledged not as *black*, but as *white* — who but a white woman can do this for me? By loving me she proves that I am worthy of white love. I am loved like a white man. I am a white man. Her love takes me onto the noble road that leads to total realization...I marry white culture, white beauty, white whiteness. When my restless hands caress those white breasts, they grasp white civilization and dignity and make them mine." (Fanon 45)

Fanon demonstrates that there is an internalization of the sexual embodiment that reveals a psychological juxtaposition of the sexual objectification of the female form and the social position granted to the women based on the value assigned to this form. The history of invisibility, disempowerment, and demasculinization inherent within the masculine colonial experience of the oppressed is manifested post-colonially, in his desire to reclaim power through association with the entity—white culture—that took it.

The sexualization of the American Dream through racialized dating preferences also finds theoretical support in the work of the sociologist Thorstein Veblen in the form of conspicuous consumerism. Conspicuous consumerism, as presented in *The Theory of the Leisure Class: An Economic Study of Institutions*, explores the idea that individuals will consume those items that allow them to attain a position — or at least perception of a position — of privilege or repute in society (Veblen 96). Although the act of consumption may not reflect the reality of the situation, the individual is still attracted to the façade that the performance of the reputable provides them with (Veblen 74). In application to the pursuit of white women by Asian-American men, there is no greater means of demonstrating the achievement of the American Dream than through the approval of those who serve as the gatekeepers to that dream. In this sense of masculine objectification within the Asian-American pursuit of the American Dream, the social capital provided by a white woman is greater than that provided by any object of material wealth.

The application of the post-colonial theories of Frantz Fanon help to clarify, as do the consumerist theories of Thorstein Veblen, and contextualize the troubling representation of Asian-American within the context of the American Dream; however, it does not offset the social reality that the sexual pursuit of the American Dream depicted in *American Born Chinese* and *Shortcomings* represents. This phenomenon distracts Asian-American males from truly enacting social change and reclaiming the right to the American Dream, by encouraging them to pursue a superficial solution. The sexualization of the American Dream sows disunity in its division of Asian-American men and women. It is this social impact that is perhaps the most troubling, as Asian-American women become a casualty of misguided sexual assimilation and Asian-American men become unintentional co-conspirators in their own alienation. . The issue needs to be resolved within our imagery, narration, and reality if we are hoping for a future in which the internalized cycle of sexual rejection by Asian-American men and women can be broken and the community can find value in one another and the shared cultural history. The real goal is for both Asian-American men and women to consider dating outside of the race an option, but not a goal. The American Dream is becoming broader and broader everyday, however, the Asian-American community does not need to wait for inclusion, but can be active in creating a new image of the American Dream that is rooted in the reconciliation of identity.

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Current Topics in HIV-1 Vaccination Research

*J. H. Ziegler IV
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Introduction

Human Immunodeficiency Virus (HIV) infections have been a global health concern since the first known cases in the early 1980s. Over the past quarter century, HIV has spread to all corners of the globe, resulting in one of the deadliest pandemics of modern times. With over 33 million individuals currently infected and 2.5 million new infections each year worldwide, the death rate for HIV-1 victims is not expected to decrease in the foreseeable future (Bongaarts et al., 2008). Although treatments are available to extend the lifespan of individuals infected with HIV-1, finding a vaccine to prevent initial infection is of paramount importance.

In 1984 the U.S. Secretary of Health and Human Services declared that a vaccine would be available within two years, but the medical community was unprepared for the difficulties it would encounter in this pursuit. Traditional methods of vaccination, such as introducing weakened or disabled viral agents in order to trigger an immune response, have proven ineffective in preventing HIV-1 infection. Vaccines based on live, weakened HIV-1 can mutate and regain their pathogenicity after introduction to the human bloodstream (Letvin, 2006). New and innovative approaches are necessary to address the spread of this virus.

There are two primary branches of research into an HIV-1 vaccine: Neutralization of the virus through the use of artificial antibodies and blocking the pathways the virus uses to enter host cells (Montefiori et al., 2007, Hütter et al., 2009). Both methods share the goal of preventing the virus from replicating, but attempt different methods to achieve this goal. The first, using HIV-1 specific antibodies to bind to important sites on the virus, neutralizes vital phases in the replication process, while the second method, removing proteins necessary for the invasion of host cells, would essentially isolate the virus and prevent opportunities to reproduce.

The major advantage of preventing the virus from replicating is the decreased chance of generating viral escape mutants (Anderson et al., 2007). An escape mutant is a version of the original virus that is not affected by the current treatment method. Mutant strains occur due to replication errors and occasionally result in modified forms of the virus that cannot be recognized by the immune system. Therefore, the immune system has no defense against the virus.

Thesis

As the global HIV-1 pandemic continues to spread at a rate of 2.5 million new infections per year (Bongaart et al., 2008), the need for an effective vaccine

against the virus escalates. Three major obstacles must be addressed in the creation of an effective HIV-1 vaccine: latent infection, viral diversity, and the lack of an effective immune response (Johnson and Fauci, 2007). Failure to address any one of these obstacles will result in an ineffective long-term solution.

Latency and Diversity as Obstacles in HIV-1 Vaccination

One of the major complications in the development of an HIV-1 vaccine is the issue of viral latency. Viruses reproduce by injecting their RNA into replicating host cells, forcing the infected cells to produce copies of the virus using their own reproduction mechanisms. However, HIV-1 is a lentivirus, a virus capable of infecting non-replicating cells. If a non-replicating cell becomes infected, it can harbor the viral RNA until it either dies or begins to replicate. Since the infected cell remains externally identical to non-host cells, latent viral infections cannot be detected neither by the body's immune system nor current screening methods (Jeeninga et al., 2008). Fortunately, non-replicating cells are rarely stable for more than a few days, and are not important for long-term latency (Jeeninga et al., 2008).

After developing an immune response to a pathogen, CD4 T-cells that recognize the pathogen enter a dormant state in order to be available to attack future infections (Jeeninga et al., 2008). T-cells, which have been infected with HIV-1 sometimes enter this dormant state, and will not replicate until the T-cells begin to replicate. These resting T-cells persist with an average half-life of 44 months and it can be estimated that it will take more than 60 years to eradicate this reservoir (Jeeninga et al., 2008). Attempts to activate these latent cells and expose the viral reservoirs have had limited success (Jeeninga et al., 2008).

Under ideal conditions, modern antiretroviral therapy is capable of reducing the HIV-1 viral load to undetectable levels, but patients tend to relapse immediately on discontinuation of highly active antiretroviral therapy (HAART) (Jeeninga et al., 2008). Once a relapse occurs, future treatment may become more difficult, as cells harboring latent HIV-1 have been linked to increased mutation rates (Marcello, 2006). As it replicates, the virus develops greater viral diversity within the infected individual, often developing resistance to antiretroviral therapy.

All reproduction methods can result in errors, called mutations, and viruses such as HIV-1 are no exception. The mutation rate in viruses is significantly higher than most other forms of life, as viruses lack a method of correcting replication errors. The result is a huge amount of variability within viral populations, including variants referred to as escape mutants (Poignard et al., 1999).

Escape mutants are versions of a parent virus with replication errors that make them different enough from the original virus that the host's immune system is not able to recognize or target them (Anderson et al.,

2007). If the host is being treated for the original viral infection, these mutants may demonstrate significant resistance to the current treatment method and continue to replicate, leading to a relapse in the host and requiring different treatment (Poignard et al., 1999).

After initial infection or relapse, HIV-1 rapidly diversifies into a swarm of variant viruses, each capable of resisting different antibodies. According to some models, this diversification can be averted if the initial antibody concentration is high enough to neutralize the virus before it can begin to replicate (Poignard et al., 1999). Cases of successfully preventing infection in this manner are rare, however, as these levels of antibody concentration usually only prove capable of slowing disease progression until the virus develops an escape mutation capable of circumventing the immune response. Once this escape mutation occurs, viral levels quickly climb to match control models (Poignard et al., 1999).

The enormous diversity of HIV-1, both globally and within an individual, is often cited as the chief stumbling block to the development of a vaccine (O'Connor & Burton, 2006, Montefiori et al., 2007, Léourneau et al., 2007). The diversity of HIV-1 variants observed within a single infected individual is greater than the sequence diversity of influenza, another diverse virus, during a global pandemic (O'Connor & Burton, 2006). Taking this in context, if annual vaccinations flu shots are required to compensate for the diversity of the influenza virus, obviously drastic measures are required in order to immunize against a pathogen as variable as HIV-1.

Triggering an Immune Reaction against HIV-1

Since viruses are unable to reproduce on their own, they replicate by injecting their own RNA into a host cell, hijacking that cell's reproduction mechanism. The host cell then produces copies of the virus and, upon death, ejects these copies into its environment. In most organisms, the presence of foreign bodies, such as viruses, triggers an immune response, a reaction in which the organism's immune system can target and destroy alien particles. While this reaction is sufficient to combat the majority of pathogens, HIV-1 has proven to be an exception.

Lentiviruses such as HIV-1 target the immune system directly, crippling the host organism's ability to create the necessary antibodies to combat the infection. The host organism's immune system may recognize HIV-1 as a threat and attempt to repel the virus, but the increased CD4 T-cell concentrations from this response only provide additional host cells for viral replication. The natural response to HIV infection neither controls viral replication nor prevents superinfection, and as a result no protective immune response against the virus has ever been observed (Watkins, 2008). In order to compensate for the inability to naturally produce these protective antibodies, artificial antibodies can

be engineered and introduced into the host organism (Léourneau et al., 2007). These antibodies are capable of protecting CD4 T-cells against HIV-1 infection under controlled conditions, but face the enormous roadblock of enormous HIV-1 diversity (Poignard et al., 1999).

Antibodies neutralize the virus by binding to the surface gp120 and trans-membrane gp41 envelope glycoproteins, blocking HIV-1 entry into susceptible cells. However, the virus exploits several mechanisms to shield itself against antibody recognition, including a dense outer coating of sugar molecules and extreme variation of the aforementioned surface proteins (Montefiori et al., 2007). The outer coating protects the viral RNA from direct attacks, making indirect methods such as neutralizing the protein binding sites, a more feasible option of prevention.

There are four major approaches for dealing with HIV-1 diversity. The first is the development of an antibody based on a single clade, or variant, of the virus similar enough to all other clades to produce a cross-reactive immune response (Léourneau et al., 2007). This method is plausible due to the fact that all variants of a virus derive from a common ancestor and therefore, share a similar structure. By selecting the clade with the closest sequence to all others, an immune response could be generated capable of offering protection against all similar clades. This approach has been proven effective in test models, but only after antibody concentrations have been raised to high enough levels to make practical application impossible (Léourneau et al., 2007). This approach addresses HIV-1 variability within a limited scope, but does not effectively address the further diversification of the virus over time.

The second approach is to derive vaccine immunogens from centralized sequences of viral RNA. Despite the variability of HIV-1, all clades are similar enough that a common ancestral sequence could be extrapolated from currently circulating viruses (Léourneau et al., 2007). As with the first technique, these common sequences might also be able to target all circulating viruses. These centralized sequences are designed to minimize the difference between a vaccine immunogen and circulating viruses, but may not be able to offer optimal protection from all variants.

The third approach is to deliver a vaccine consisting of a cocktail of immunogens derived from different clades (Catanzaro et al., 2006). This "shotgun approach" is likely the simplest, as it uses multiple immunogens to target a variety of specific clades, rather than a single wide-spectrum immunogen targeting the same number of variants. Initial results with this technique have been encouraging, but doubts remain due to the possibility of interference between closely related peptide sequences in the vaccine, which may limit responses to some antigens (Léourneau et al., 2007).

The final major approach is the use of "mosaic" immunogens designed to optimize coverage of CD4

T-cell epitopes (Fischer et al., 2007). This technique involves assembling a polyvalent vaccine candidate capable of targeting multiple variants of HIV-1. Potential problems with this technique are similar to those of other cocktail techniques, such as immune interference (Léourneau et al., 2007). Another potential problem is the inclusion of both variable and conserved regions. Viral responses to variable regions of the immunogen may draw attention away from more useful conserved regions.

HIV-1 Resistance and CCR5- Δ 32

In the mid 1990s, rare individuals were discovered who were resistant to HIV-1 even to the point of effective immunity (Liu et al., 1996). These individuals were found to have a homozygous defect in the Chemokine Receptor-Five (CCR5) allele resulting in a truncated protein incapable of serving as a receptor for HIV-1. The defective allele, called Delta-32 (Δ 32) appears to have no significant negative effect on cellular function. Other chemokine receptors, such as CCR1, compensate for the deletion of CCR5, but do not act as receptors for HIV-1 (Liu et al., 1996, Galvani et al., 2003).

The theory surrounding the development of a CCR5-based vaccine is relatively simple: since HIV-1 enters the host cells by binding to a CD4 receptor and then interacting with a chemokine receptor, primarily CCR5 (Anderson et al., 2007, Hütter et al., 2009), disabling or sufficiently downregulating the protein could significantly hamper or even prevent viral replication (Liu et al., 1996, Hütter et al., 2009). Unable to replicate, the virus would present no threat to the infected individual and would eventually be forced out of the body.

The preventative potential of CCR5- Δ 32 was demonstrated practically by Hütter et al. in 2007, when a patient suffering from both HIV-1 infection and acute myeloid leukemia received an allogeneic stem-cell transplantation with stem cells from an unrelated donor who had been screened for homozygosity for the CCR5- Δ 32 allele (Allers et al., 2011). The patient, who had been diagnosed with HIV-1 ten years prior, discontinued HAART after the transplant. In this patient, no active replicating HIV could be detected 20 months after HAART had been discontinued (Hütter et al., 2009, Allers et al., 2011). The patient achieved complete chimerism, and his blood monocytes displayed a homozygous CCR5- Δ 32 genotype (Hütter et al., 2009).

While this case clearly emphasizes the importance of CCR5-targeted treatment strategies, uncertainty remains over whether a cure for HIV-1 infection has been achieved in this patient (Allers et al., 2011). Despite HIV-1 levels dropping below measurable quantities, the virus may still be present in latent reservoirs. Mutation into a strain capable of entering host

CD4 cells through other chemokine receptors, such as CXCR4, could result in a relapse.

Despite the proven effectiveness of allogeneic stem-cell transplants, the rarity of the CCR5- Δ 32 homozygous genotype is extremely rare, occurring almost exclusively in populations of western European heritage, and only in 1% of those populations (Liu et al., 1996). The rarity of this genotype, combined with the expense of stem-cell transplants would make this therapy prohibitively expensive for general use. A plausible alternative is the use of gene therapy to disable the production of the CCR5 protein (Anderson & Akkina, 2007).

The expression of the CCR5 gene can be disabled by introducing small interfering RNA (siRNA) to interfere with the production of the associated protein (Anderson & Akkina, 2007). Several highly potent siRNAs have already been derived and have proven capable of almost completely disabling CCR5 expression. If these siRNAs can be mass-produced, they may represent a realistic vaccine against HIV-1.

Conclusion

The major advantage of preventing the virus from replicating is the decreased chance of generating viral escape mutants capable of avoiding the treatment (Anderson & Akkina., 2007). Since each replication cycle increases the chance both of generating an escape mutant and of developing latent reservoirs, viral replication must be prevented long enough for the host's body to purge the infection.

Downregulating the CCR5 gene could result in inactive CCR5 proteins, preventing HIV-1 from infecting host cells and reproducing. While this would prevent symptoms of infection from occurring, it may still be possible to spread the virus to unprotected individuals. Additionally, the only successful complete downregulation of CCR5 was the result of an allogeneic stem-cell transplant (Anderson & Akkina, 2007, Hütter et al., 2009, Allers et al., 2011), a procedure which would prove prohibitively expensive for mass vaccination even before screening for CCR5- Δ 32 homozygosity (NBMT Link, 2010). Finally, CCR5 downregulation does not address the HIV-1 variants, which utilize other chemokine receptors. If only CCR5-specific HIV-1 strains are protected against, CXCR4-tropic strains may rapidly emerge (Anderson & Akkina, 2007).

Despite these concerns, downregulating the CCR5 gene remains the most plausible solution to the issue of HIV-1 vaccination. However, this therapy must be combined with additional measures in order to prevent intense selection of CXCR4-tropic strains; the emergence of which would negate the effectiveness of the treatment (Anderson & Akkina, 2007).

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