

Margins II



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A Journal of Exploratory Research and Analysis

The nine research articles published here represent the Capstone Research efforts of recent graduating seniors in the University Honors Program. The articles present projects conceived from personal academic interests and mentored by faculty who are familiar with the research and scholarship driving these efforts of discovery.

While the stirrings of personal interest are a crucial element in the cultivation of sound research practices, they should not be confused with the stirrings of sound research practices themselves. The stirrings of sound research emerge only from a special growth in perspective, and the goal of good mentoring is to awaken these stirrings and override the restrictive limits of personal interest and its attendant beliefs. We thank our faculty mentors, over a hundred so far, who have worked with our Capstone students over the years to frame and conduct interesting and effective research projects.

In the course of acquiring new perspective in life, we may find ourselves experiencing new attunements, attitudes and convictions. A closer look may even reveal how well these orientations sensitize or desensitize us to blind spots in our understanding. Are there perhaps some issues, concerns, opportunities and challenges that are relevant to our lives, but that we can only appreciate *from different angles*? As we grow older in life, we are fortunate if we discover new points of entry to our surrounding world, but only by closing off

or eclipsing *other* points of entry will these points of entry actually open up for us.

To see the world in a new light, to acquire new *entries* to the world, means to listen more attentively and to become responsive in new ways. The capacity for us to respond to issues and concerns otherwise masked from view demands a special openness and attention to experiences that may otherwise seem strange and challenging. We seldom see the world in a new light without first having the curiosity--and the willingness--to explore surprising, unexpected, easily marginalized phenomena--nor without first learning to discern otherwise hidden facets of our filtered social and personal constructions.

We trust the articles collected here will draw your interest and curiosity to margins of human experience where new angles of entry await us--soliciting us, encouraging us, challenging us--*to respond*. The goal of these writings is to increase awareness of what is actually *at stake*, and to integrate this into the formation of a compelling set of research questions. Several articles take the next step and present findings based on analysis of critical feedback and exploratory questions, and several articles take a further step and suggest how these findings might influence positive developments. The process guiding these efforts strives to raise *curiosity* to the level of *sound research*. By drawing you into these inquiries, we hope to spark your interest in exploring margins of your own experience.



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Seniors in the Honors Program are encouraged to tackle complex problems using methods, insights and knowledge drawn from relevant disciplines. Honors Program faculty and capstone research mentors offer critical feedback and guidance along the way. The main objective is for students to explore, gather, and analyze information effectively, and to share their reflections on the implications of what they have discovered. Group discussions help to promote thoughtful questioning and critical analysis. The primary goal is to communicate knowledge, judgments, and original perspective cultivated on the basis of careful inquiry, exploration and analysis.

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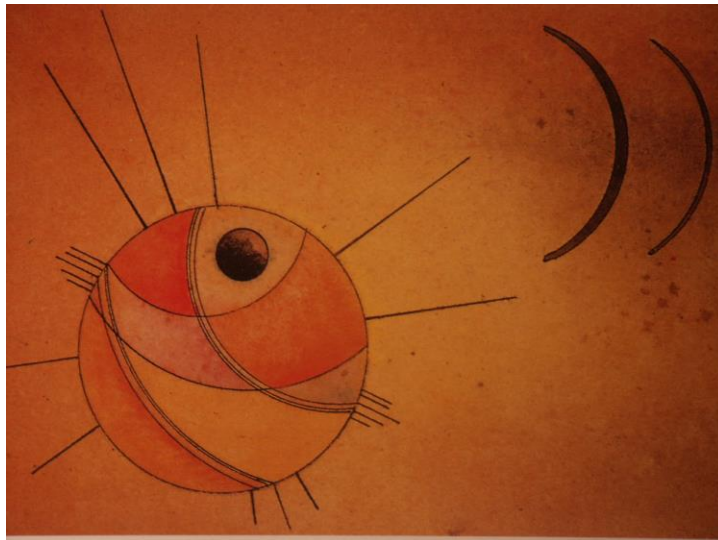
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HONORS PROGRAM COMMUNITY STATEMENT

The Honors Program at CSU Stanislaus is a community of scholars bound together by vital principles of academic openness, integrity, and respect. Through focused study and practice involving exploration and discovery across a variety of disciplines, the Honors Program upholds these principles of scholarly engagement and provides students with the necessary foundations for further research and inquiry.



Our interdisciplinary curriculum is integral to this work, and is intended to facilitate creative understanding of the irreducible complexities of contemporary life and knowledge. Personal and intellectual honesty and curiosity are essential to this process. So, too, is critical openness to difficult topics and respect for different perspectives, values and disciplines. The Honors Program aims to uphold these virtues in practice, in principle, and in community with one another.

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Transforming Gender Roles in the Colonial Andes: Native Andean Female Resistance to Colonial Spanish Constructs of Gender Hierarchy

Ashley Reeves

Although past scholars have conducted extensive historical research regarding the colonial period in Latin America, the woman's experience under colonial rule is a topic that is often neglected in major historical interpretations. Though scholars have recently begun devoting more attention towards the roles and experiences of women in colonial Latin America, the colonial experience of native women in the Americas has only just begun to be seriously studied by historians in the past few decades.

This research is intended as a gendered investigation into the native Andean woman's experience under Spanish colonialism. This gendered colonial perspective is aimed at analyzing the ways in which resistance efforts undertaken by native Andean women in response to colonial gender hierarchies contributed to the greater cultural preservation efforts of the Andean people. While this region certainly includes native women of the conquered Inca Empire, particularly those in Peru and Bolivia, it is by no means exclusive to this civilization. Native women of diverse ethnic and cultural groups in the Andes, some of which remained unincorporated by the Inca at the time of the Spanish conquest, will also be included, as their colonial experiences are equally valuable to a cohesive understanding of women's roles under the Spanish empire.

An investigation into the drastic decline in social and economic status that native Andean women experienced during the colonial period is the central focus of this research endeavor.

No aspect of the native Andean woman's life, status or role in society went untouched by Spanish colonizers. While in the pre-conquest period Andean women enjoyed higher privileges than their European counterparts, the imposition of colonialism and the Spanish constructs of gender hierarchies sought to eradicate traditional Andean gender roles and norms by any means necessary. Under colonial Spanish rule, Andean women could no longer own land independently of their husbands, hold important religious offices, access community resources or enjoy the myriad of social, political and economic rights that they had held for centuries.¹ Instead, Andean women, through the Spanish imposition of foreign gender roles, were systematically disenfranchised and subordinated in colonial society.

This study will explore the various methods of female resistance to these newly imposed Spanish gender roles undertaken by Andean women throughout the colonial period. The majority of these resistance efforts by native women of the Andes can be classified as "passive" resistance efforts, and constitute actions by which native women managed to undermine, subvert or manipulate the colonial system and gender roles to better protect their fading status and power. Though passive resistance was the method most widely used by native women during the colonial period, there are notable instances of female involvement in military rebellions by native populations, like the Tupac Amaru rebellion of

¹ Silverblatt, Irene. *Moon, Sun, and Witches: Gender Ideologies and Class in Colonial Peru*. New Jersey: Princeton University Press, 1987. 122.

the late eighteenth-century. Another powerful indicator of female resistance efforts is the incredible resurgence, and at times revival, of native Andean religious traditions that occurred throughout the colonial period. Native women were often the leaders of these traditional cults, and their religious resistance efforts are perhaps the most long-lasting and successful efforts to subvert the exclusionary Catholic religion and its ruling patriarchy. These measures of female resistance to the colonial institution of gender hierarchies can be interpreted not only as attempts to salvage pre-conquest female rights, economic privileges and social standing, but also as part of a struggle to preserve greater native cultural and religious institutions in the face of the Spanish suppression and destruction of Andean culture.

The Pre-Columbian Andes

Long before the conquest of the Inca Empire and surrounding territories by the Spanish conquistadors in 1532, Andean peoples were already well acquainted with patterns of conquest and domination by rival groups. The very geography of the Andes region promoted domination, as competition for prime resources and agricultural land in such a mountainous region was fierce, so that even before the Spanish conquest, Andean history was littered with a pattern of conquest and domination. However, it was not the conquest of 1532 that threatened the survival of Andean society, as Andeans had a great deal of experience with such events; the difference lay in the fact that Andeans were not conquered by a neighboring group with similar values, cosmology, and gender constructions like the Inca, but instead by a foreign power with alien values that were diametrically opposed to their own.

² Ibid., 197.

Andean people were equipped to evade domination through their pre-Columbian experiences with conquest; just as the geography of the Andes made struggle inescapable, it also helped to foster resistance to domination. It was quite common for Andean groups that did not wish to be incorporated into a larger empire to seek refuge in the mountains, and during the expansion of the Inca Empire in the fifteenth century, a number of semi-sedentary groups fled to the mountains to protect their autonomy. Upon the arrival of the Spanish in 1532, smaller semi-sedentary Andean groups once again practiced this resistance method, seeking to evade the Spanish in the harsh terrains and high altitudes of the Andes mountain range.² But while the geography of the Andes fostered resistance measures towards the Spanish, geography alone cannot account for the centuries of resistance by Andean populations, or the remarkably high rate of cultural preservation that exists in the region today even after centuries of intense colonialism. The colonial resistance efforts of native Andean women in particular are directly responsible for the cultural preservation of larger Andean society and traditions.

Andean Gender and Cosmology

Prior to the development of the Inca Empire in the fifteenth century, Andean culture, cosmology, and gender constructions were quite egalitarian as compared to others in the Americas. The invasion of a warrior society like the Inca, however, hampered the gender equality inherent in Andean society, so that native women gradually lost previously held powers and rights. While women did experience a marked curtailment of their status under the Inca Empire, the Inca understood that they could not push women out of powerful positions entirely, lest they upset the very structure of Andean society.³ In the

³ Ibid., 7.

Andean world, women were acknowledged as integral figures to society, which afforded women an important degree of protection under the Inca; the vastly different role of women in Iberian society, however, allowed the Spanish to disenfranchise native women entirely in the colonial period.

The fundamental gender differences between Andean and Spanish society led to the total erasure of female power and status after the conquest, and provided Andean women with plenty of motivation for resistance in the colonial period. In the pre-Columbian era, Andean women were considered to be partners of men in “the business of life”, and the very foundation of Andean society, parallel descent, protected and upheld the power of women in Andean cultures.⁴ Parallel descent claimed that men and women inhabited separate, but equally powerful spheres of influence and power in society, including religion, politics, economics, and labor: Andean women were high priestesses, *curacas*, who owned land and fortunes independent from men, and were highly respected members of society.⁵ In contrast to the rights and privileges enjoyed by Andean women in the pre-Columbian period, the ruling Spanish patriarchy of the sixteenth-century had disenfranchised Iberian women centuries before. With the institution of the colonial system in the Andes, the Spanish usurped Andean gender conceptions with their Iberian conception of gender hierarchies, seriously demoting Andean women in the process. These demotions imposed upon native Andean women by the Spanish conquerors

incited female resistance efforts that lasted the entire duration of the colonial period.

Passive Resistance

The installation of the Spanish colonial system in the Andes brought with it a legal system heavily influenced by Iberian gender conceptions, wherein Andean women lost valued rights and legal protections that they had held for centuries. The Spanish colonial system devalued the labor of native women, both sexual and economic, so that native Andean women were heavily exploited by the colonial patriarchy. Native women undertook various measures of resistance to the misuse of their labor by the colonial authority, the majority of which consisted of passive resistance efforts, as it allowed women to subvert and manipulate the colonial system while still minimizing the risk of detection. In the pre-Columbian period, Andeans practiced limited gender division of labor, allowing for the development of a more egalitarian labor system.⁶ The labor of Andean women was equally as respected as that of men, and tribute requirements to the Inca Empire demanded equal participation in the quota system.⁷ This system ensured that the Inca received their tribute, and that the labor of native women was recognized and respected in the system. During the colonial period, the Spanish revised the Inca tribute system to reflect the economic model of a colony. The Spanish colonial system was required by the Crown to extract as much wealth and resources from the Andes as possible, which necessitated the imposition of harsher tribute and labor quotas. Andean natives were universally overtaxed under this

⁴ Powers, Karen Vierra. *Women in the Crucible of Conquest: The gendered genesis of Spanish-American society, 1500-1600*. New Mexico: University of New Mexico Press, 2005. 17.

⁵ Kellogg, Susan. *Weaving the Past: A history of Latin America's indigenous women from the pre-*

Hispanic period to the present. New York: Oxford University Press, 2005. 41.

Silverblatt, 1987. 5.

⁶ Silverblatt, 10.

⁷ *Ibid.*, 132.

system, but Andean women especially were targeted, forced to pay exorbitant amounts of tribute to the Spanish, which sparked female resistance measures accordingly.

The tribute expectations of the Spanish victimized natives regardless of gender, but women were held accountable for their husband's tribute in the event that he defaulted, an occurrence that became quite common due to the inhumane labor demands of the Spanish. The Inca system of tribute collection followed gender equality structures, so that only married couples were obligated to contribute, as the quota was impossible for a single person to fulfill, and the elderly and unmarried were exempt. The colonial tribute negated the fair labor laws of the Inca in the interest of mass profit, forcing women of all ages to meet high tribute demands.⁸ The strain of the new tribute system was further compounded by the Spanish' seizure of peasant lands that had been previously used to fulfill tribute quotas, so that Andeans were forced to use their family plots to fulfill the tribute quota, which left many peasants unable to adequately provide for their families.⁹ To further expedite the process of tribute collection, the Spanish devised a system of native reservations, or *reducciones*, during the sixteenth century, which forced large native populations to live in cramped compounds under the supervision of the colonial authority. These new *reducciones* forced Andeans to abandon their tradition of endogamy, or marriage within their villages, a practice meant to ease labor requirements. Instead, Andeans had to adopt marriage exogamy, unions outside their villages, which made women responsible for double tribute, in their natal and marital villages, further

devaluing female labor.¹⁰ Labor conditions for peasants were harsh and unreasonable, so that tribute payment meant economic destitution for native women. The intense supervision by colonial officials in the tribute collection process did not allow for grand, overt gestures of resistance by Andeans, but native women nonetheless resisted these inhumane labor conditions, albeit in a more subtle manner.

The exploitation of female labor by the Spanish colonial tribute system led to increased economic responsibilities for Andean women during the early colonial period. Men and women were both treated as slave labor by the Spanish and forced to work in long hours in sweatshops for scant compensation, but when husbands fled these barbaric conditions, they unwittingly placed even greater labor burdens on their families.¹¹ Conditions continued to deteriorate for native women due to the colonial bureaucracy's failure to adjust population statistics to account for male flight and the decline of native populations, which prompted a response of female resistance.¹² Though native flight was a dangerous method of tribute evasion, Andean women did escape the crippling labor exploitation of their rural villages by migrating to colonial centers. In a larger town, native women were free of tribute expectations, and were able to establish themselves as relatively independent market women.¹³ Other Andean women opted to migrate seasonally between rural villages to evade tribute payment; this method was so pervasive that sixteenth-century colonial records documented the phenomenon, along with the natives' fear of returning to their natal villages for fear of reprisal.¹⁴

⁸ Ibid., 129, 126.

⁹ Ibid., 127.

¹⁰ Ibid., 131.

¹¹ Ibid., 135.

¹² Ibid., 137.

¹³ Powers, 66.

¹⁴ Ramirez, Susan Elizabeth. *The World Turned Upside Down: Cross-cultural contact and conflict in sixteenth-century Peru*. Stanford: Stanford University Press, 1996. 35.

The majority of Andean women had difficulty simply evading their tribute expectations, however, and instead sought to undermine the colonial tribute system through reproductive resistance efforts. As victims of the unreasonable demands of colonial tribute quotas, Andean women devised various methods to spare their children the same physical and economic exploitation. Native midwives continued to practice covertly in small communities, providing Andean women with contraceptives, which helped return a measure of personal power to women that had been usurped by the Spanish.¹⁵ Andean women also committed census fraud to protect their children from tribute demands, claiming their children as mestizos on baptismal records, as only natives were required to pay tribute.¹⁶ In fear of raising the next generation of slave labor for the Spanish, some mothers took drastic action; in Ecuador, a colonial priest found evidence that Andean women had mutilated their infant sons to render them useless for tribute. Though rare, some Andean women took still greater precautions towards protecting their children from colonial labor exploitation, resorting to abortion or infanticide. When one Ecuadorian mother was caught burying her newborn son alive by the village priest, she claimed that she had killed her child so that "...he would not have to see Christians in his lands."¹⁷ While reproductive resistance efforts did not directly influence labor revisions in the colonial system, they did signify an attempt to reclaim female labor privileges, both sexual and economic.

While the colonial legal system was not designed to be accessible to native women, elite Andean women nonetheless formally protested the loss of their legal and economic

rights under colonization. The Andean gender structure allowed for equal and independent female ownership of land and other property, following matrilineal descent, so that elite Andean women often owned parts of entire native communities.¹⁸ These elite women lost their land rights after the conquest, as Iberian law did not recognize female ownership, relegating women to their colonial status as legal minors, incapable of making independent legal decisions.¹⁹ Elite women suffered land theft by both the Spanish and their Andean husbands, who took advantage of the unprecedented opportunity to increase their personal land holdings. These Andean women took both their husbands and Spanish colonists to court, and though very few cases were ever resolved in their favor, the very act of legal resistance was of momentous import.²⁰ Elite women further protested male usurpation of their property in their wills, as an act of final defiance to the legal ramification of Spanish imposed gender hierarchy. Juana Chimbo, a wealthy Andean woman, protested her husband's theft of her land in her final will; Juana demanded that her property be granted only to her female relatives, because her husband had "no rights whatsoever" over her lands.²¹ A caveat included in Juana's will provides a clear indication that elite women actively sought to subvert the colonial system that robbed native women of their legal independence and rights. These formal and documented instances of female resistance to their new position in the colonial system is evidence of a larger resistance by Andean women throughout the colonial period, and is indicative of an attempt to subvert the patriarchy, both native and Spanish.

Violent Resistance

¹⁵ Powers, 178.

¹⁶ *Ibid.*, 178.

¹⁷ *Ibid.*, 178.

¹⁸ Anton, 38.

¹⁹ Silverblatt, 119.

²⁰ Silverblatt, 120.

²¹ *Ibid.*, 121.

While there were limited instances of organized resistance by native women during the colonial period, there are still fewer occurrences of organized violence against the Spanish patriarchy with high levels of female involvement. Whereas occasions of passive resistance were usually conducted by individuals, and were directed at the covert subversion of the colonial system, instances of organized violence required mass participation and took decades to foment. The most notorious violent uprising in colonial Andean history was the Tupac Amaru Rebellion of 1780-1782, an event that utilized the mass unrest of huge native populations with military precision.²² For two centuries, native Andeans had suffered extreme losses of social, economic, and religious status, and after an extended period of continued abuses, native groups were prepared to reclaim their lost rights through violent means. The uprising was led by Tupac Amaru, a native Andean that claimed to be the rightful heir to the fallen Inca Empire, and who pledged to eradicate the oppressive colonial system through military force.²³ Women not only participated as followers in the rebellion, they also held prestigious military positions in the rebel forces. Tupac Amaru's wife, Micaela Bastides, served as a military strategist, absentee general and troop commandant in her husband's absence. Micaela was reported to have personally led five thousand native soldiers into battle against the Spanish, and was remembered by a captured Spaniard as being as "cruel a monster" as her husband in obtaining information from captured Spaniards on enemy movements. Female *curacas*, or regional leaders, who had been dispossessed of their titles by the colonial patriarchy also flocked to the cause, and enjoyed positions of

²² Stavig, Ward and Ella Schmidt (eds.). *The Tupac Amaru and Catarista Rebellions: An anthology of sources*. Indiana: Hackett Publishing, 2008. 61.

high reputation in the rebel army. Curaca Tomasa Titu Condemayta was a rural leader that served as a field commander in the uprising, and received her orders directly from Tupac Amaru, an indication of her high status in the movement.²⁴

The presence of native women in the high command of the rebel army represented the survival of dual leadership, an Andean conception of gender parallelism in authority positions, which managed to outlast the brutal eradication efforts of the colonial gender structure. A sizeable proportion of the soldiers in the movement were also native Andean women, and though they did not occupy prestigious positions like Micaela Bastides and Curaca Tomasa, they supplied the soldiers with weapons and fought alongside the men in skirmishes with the Spanish.²⁵ The Spanish forces were especially disturbed by the masses of female soldiers in the movement, and the gruesome public executions of the high female command illustrate the gender inversion that these women represented to the Spanish colonial system. While rare, the high female involvement in the Tupac Amaru Rebellion illustrated the continued resistance efforts of native Andean women to the colonial gender hierarchy.

Religious Resistance

Resistance to the religious changes instituted by the Spanish with the introduction of Catholicism during the colonial period was an especially contentious point for Andeans. Both the Andean religion and Catholicism were structured around their respective gender structures, so that the high religious status enjoyed by Andean women prior to the conquest was replaced with subservient religious role of Iberian Catholicism. The higher status of women in Andean society was

²³ *Ibid.*, 19.

²⁴ *Ibid.*, 92, 65, 89.

²⁵ *Ibid.*, 98.

directly reflected in their religious roles and positions, which the introduction of Catholicism directly challenged. Andean religion followed the model of parallel descent, so that worship and authority positions were divided equally along gender, providing native women with separate, but equally powerful religious influence as Andean men. Parallel descent also influenced Andean cosmology, so that female deities were incredibly powerful figures in religion. In fact, it has been suggested that Andean cultures had “an ancient tradition of female supernaturals, perhaps older than in Meso-america.” The strength and preeminence of Andean goddesses suggests that Andean women were equally as respected in religious matters.²⁶ Female priestesses held corresponding high positions of religious authority as their male counterparts, and held total control of religious orders devoted to female goddesses like the powerful creator mother Pachamama and the corn goddess Saramama.²⁷

Andean female religious authority was not untested when the Spanish arrived in 1532, as the Inca Empire had similarly targeted women’s power and influence in the religious sphere. As a male-dominated warrior society, the Inca had different ideas of gender authority, which led to their replacement of ancient female deities with a supreme male god, the sun god Inti. The Inca further interfered in the religious practices of women by demanding that women break the tradition of gender parallelism and worship male gods alongside female.²⁸ The Inca also asserted control over positions of female religious authority with the introduction of the *aclla* system. *Acllas* were young virgins that were reaped by the Inca from conquered native groups, and installed as priestesses devoted to

Inti, which established the superiority of the Inca patriarchy over women in religion. This religious control did have its limits, however, as the *aclla* system inadvertently established a female “leadership hierarchy” within a male-centric religious order.²⁹ Although Andean women had suffered male interference in their religious power under the Inca Empire, the institution of Spanish Catholicism in the Andes not only curtailed the religious independence of Andean women, but attempted to decimate the female religious sphere entirely.

The introduction of Catholicism to the Andes resulted in the demotion of native women in nearly every aspect of religious practice. Where there existed an entire pantheon of goddesses in Andean mythology, the embodiment of powerful creative and sexual forces, Catholicism had limited the power of divine female figures. The most significant female figure in Catholicism was the Virgin Mary, and while highly revered, Mary was a submissive figure, and largely outranked by male deities. The conversion further weakened the power of native women by cutting them out of the creation process entirely; while Andean religion had a founding couple, Catholicism had only a founding father, which left newly “converted” Andean women religiously adrift and disenfranchised.³⁰ Andean women not only lost religious authority during the conversion to Catholicism, they were also persecuted for imagined acts of evil solely for their gender. Though Andean religion was devoid of a devil figure, the Spanish projected their religious gender biases onto native women, with their assumptions that they worshipped the devil because of the supposed disposition to evil of the female sex.³¹ Women in positions of religious authority were considered to be an

²⁶ Kellogg, 41.

²⁷ Silverblatt, 32.

²⁸ *Ibid.*, 41.

²⁹ Kellogg, 50.

³⁰ Powers, 24.

³¹ Silverblatt, 173.

affront to acceptable gender roles in the new colonial order, and not only indecent, but dangerous to the mission of conversion undertaken by the Catholic Church.

In response to the various religious demotions and denigrations suffered by pious Andean women following the Spanish conquest, native women began to actively commit acts of religious resistance towards the new Catholic religion that was so intent on suppressing them. In the immediate wake of the conquest, resistant Andean women claimed to have fully converted to Catholicism, while secretly continuing to practice native religious rituals. Former priestesses continued to hold their positions in the community, acting as confessors and religious guides to fellow native women in direct opposition to the Catholic decree condemning these practices as acts of heresy. Andean women resisted these religious changes in various ways, the most powerful of which were the revival of native cults, creation of puna society, manipulation of witchcraft, and the Taqi Onqoy movement.

Native cults

Through the revival of female-oriented religious cults, native women successfully resisted Catholic conversion and helped to ensure greater preservation of Andean religion. Colonial court records from the seventeenth-century attest to the high level of female involvement in religious cults. A female cult devoted to the corn goddess, Saramama, was denounced by Bernardo de Noboa, a Spanish colonial official, for teaching other natives the “traditions of their ancestors” in “defiance of colonial civil and ecclesiastical courts.”³² The punishment for religious opposition was extremely harsh in colonial Peru, as the leader

of this particular cult, Isabel Yalpay, received one hundred lashes, was forced to work for the Church for ten years as penance, and was denounced as a witch and a dogmatist by the colonial court.³³ Such harsh punishments for women reflect the Church’s recognition of the power that native women had in Andean communities, as they were able to reverse the conversion gains of the Church in significant numbers. Despite these repercussions, native women continued to defy the Catholic Church, as the conversion not only dispossessed native women of religious authority, but threatened cultural traditions as well.

Women of the puna

The most successful case of organized religious resistance during the colonial period was the development of a sizable female community in the rural Puna grasslands, where female leaders of “outlawed indigenous cults” defied the Spanish en masse.³⁴ Native women who had been victimized under the colonial tribute system or persecuted by the Catholic Church for heresy slowly began to populate the rural puna and established a community dedicated to the preservation of Andean culture. During the Church’s extirpation of idolatry campaign, devised to eradicate the remnants of native religion that had survived colonization, the puna gained even more inhabitants. An elderly native woman that had fled the Extirpator of Idolatry, Francisco Avila, illustrated the larger motivation of native women in joining the puna community:

perhaps then the priest is to blame if we women adore the mountains, if we flee to the hills and the puna, since there is no justice for us here.³⁵

³² Silverblatt, 32.

³³ Ibid., 33.

³⁴ Ibid., 197.

³⁵ Silverblatt, Irene. “‘The Universe has turned inside out...there is no justice for us here’:

Andean women under Spanish rule.” In *Women and Colonization: Anthropological Perspectives*, ed. Mona Etienne and Eleanor Leacock. New York: J.F. Bergin Publishers, 1980. 180.

The open religious persecution of Andean women did not inspire greater native conversion to Catholicism, but instead renewed the practice of native religious rituals. This society of female traditionalists openly rejected Spanish customs and authority, in addition to "...vigorously reject[ing] the colonial ideology which reinforced their oppression, refusing to go to mass...and returned to their native religion."³⁶ Old widows were able to separate themselves from the perceived impurities of Catholicism by their refusal to attend catechism, which allowed them to make pure offerings to the Andean gods, as they were considered unsullied by the "the world of the conquerors."³⁷ In the puna, native women were able to avoid the interferences of colonial priests that demanded their subservience to the Catholic patriarchy, and were able to create an "underground culture of resistance."³⁸ The legacy of religious resistance started by colonial native women in the puna is so strong that in modern Andean culture, the puna is still considered as "the center of women's society", and these native women are universally acknowledged as defenders of the Andean culture.³⁹

Witchcraft

The utilization of the Catholic fear of witchcraft by native women to manipulate the colonial system was an extremely innovative method of religious resistance to Spanish gender hierarchy. Though Andean religion was devoid of any reference to the devil, native women understood the power of witchcraft in asserting female influence in the religious sphere. Though native women did not believe themselves to be practitioners of witchcraft, they adopted the guise in response to repeated

denouncement by the Spanish that they were morally evil. This was a huge change in perception from the pre-Columbian period, when priestesses were revered as "virgins of the sun", to the colonial Church's condemnation of these same women as "wives of the devil."⁴⁰ Native women were doubly stigmatized by the colonial Church; as women, they were morally susceptible to evil, and as natives, their religious traditions were a manifestation of devil worship.⁴¹ As the Spanish expected native women to be witches, native women assumed the guise of sorceresses in order to both resist the colonial system and defend "pre-Columbian life ways."⁴² This method of resistance is well described by the historian Irene Silverblatt:

Rejection of the Spanish world entailed, in some measure, the use of ideological forms imported by the Spanish: thus, Iberian gender ideologies made women witches, and Andean women turned witchcraft into a means of resistance.⁴³

The resistant native population assisted these mock Andean witches in their efforts, to the extent that colonial chroniclers recalled the refusal of natives to provide the names of witches to the Spanish, so that an underground resistance movement was created purely out of the natives' manipulation of their conquerors' fear of witchcraft.⁴⁴

The Taqi Onqoy Movement

The Taqi Onqoy movement was the most famous religious resistance movement that swept the native population of the Andes throughout the mid-sixteenth century. Of the thousands of native followers, or *Taquiungos*, women made up more than half of the ranks.

³⁶ Silverblatt, *Moon, Sun, and Witches*, 197.

³⁷ *Ibid.*, 205.

³⁸ Silverblatt, *The Universe*, 180

³⁹ Silverblatt, *Moon, Sun, and Witches*, 209.

⁴⁰ Anton, 69.

⁴¹ *Ibid.*, 170.

⁴² *Ibid.*, 195.

⁴³ *Ibid.*, 213.

⁴⁴ *Ibid.*, 195.

The movement was borne out of the natives' desire to return to ancient Andean religious traditions and banish both the Spanish and the oppressive Catholic religion from the Andes, which Andeans envisioned as the result of a clash between the Andean and Catholic gods.⁴⁵ The fact that the majority of *Taquiungos* were women served as an indication as to the survival of Andean religious authority parallels, even decades after the conquest.⁴⁶ Female *Taquiungos* had significant influence within the movement; they were able to simultaneously recruit fellow natives to join the movement, and bring Catholicized natives back to Andean religion.⁴⁷ The female members of the Taqi Onqoy movement not only encouraged native resistance to their oppressive colonial masters and the Spanish world, but also tried to foster significant solidarity within the Andean world, as an effort to better salvage pre-conquest religious independence and freedoms.⁴⁸ Although the movement was ultimately unsuccessful in its goal of expelling the Spanish from the Andes, native women did manage to reverse the conversion gains of the Catholic Church, and inspire further acts of resistance amongst native Andean women.

Conclusion

The Spanish conquest of the Americas has been referred to by historians as a “gendered collision.”⁴⁹ This portrayal has certainly proven accurate in regard to the Spanish conquest of the Andes in 1532, when Spanish conquerors attempted to impose the Iberian conception of gender hierarchies on a largely egalitarian-native population. This radically fundamental disparity between the gender conceptions operating in Spanish and Andean

society resulted in a serious status demotion for Andean women after the conquest. The pre-Columbian period had allowed for a harmonious, parallel relationship between Andean men and women, so that native women were able to hold equally powerful positions in society. The introduction of Iberian gender hierarchies, however, wherein women held subordinate places in all aspects of society, reduced Andean women to their colonial status as second-class citizens. The resistance measures undertaken by native women in retaliation to these changes, passive, violent, and religious, constituted active efforts to regain previously held rights. Furthermore, such resistance efforts by Andean women during the colonial period represented a larger effort to preserve Andean culture from the destructive influences of both the Catholic Church and colonial system.

⁴⁵ Powers, 180.

⁴⁶ Kellogg, 83.

⁴⁷ Stern, Steve J. *Peru's Indian Peoples and the Challenge of Spanish Conquest: Huamanga to 1640*.

Wisconsin, University of Wisconsin Press, 1982. 55.

⁴⁸ *Ibid.*, 56.

⁴⁹ Powers, 39.

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Latina Domestic Workers in the United States: Reflections on Their Continuous Struggle

Ana M. Orozco

Introduction

Imagine yourself as a young woman who has to abandon everything she has known and loved for the past several years due to a job...a job that will cause a separation of family and friends...a job that will place her thousands of miles away from home, with no familiarity around her. She will no longer be taking care of her mother, daughter, husband, or siblings. Instead, she will be taking care of strangers. Strangers will humiliate her and treat her like a slave. They will imprison her and make her believe she has no chance of seeing her loved ones ever again. This woman will be living in their employer's home working sixteen hours a day and be fed only leftovers. She will be responsible for making all meals, grocery shopping, and cleaning the house. Additionally, she will have to wake up during the middle of the night to feed the baby and put him/her back to sleep. This job will damage her psychologically, mentally, and perhaps even physically. Approximately there are 42,080,000 women worldwide who are domestic workers ("At Least 52 Million..."). These female warriors sacrifice everything they once had to pursue a better life for their family. Their employers make them believe that being a domestic worker will bring them wealth and happiness. However, the cruel reality that these women are not told is that they will become modern slaves with a frightful life to come.

Why Does This Issue Matter?

It is needless to say that Latina domestic workers provide essential services to American families, such as cleaning, cooking, and childcare. Although their hard work is not

always recognized, their contribution to the improvement of our country is significant. One must realize that these women make a huge difference for families in the United States. A majority of the American families hire a domestic worker because they have other obligations that do not permit them to do household chores and child care. On the other hand, other families do so in order to take advantage of the vulnerability of the women and exploit her for labor. Regardless of the reason, it is clear that Americans rely on a domestic worker to do the "dirty" no American wants to do. Therefore, they believe that their American citizenship makes them superior to their status.

Purpose

The purpose of my research project is to raise awareness of conditions Latina domestic workers face while being employed in the United States. I will be seeking the reasons why Latina domestic workers are mistreated in the United States even after protection laws have been implemented for their rights. I will dissect the specific concerns that continue to burden Latina Domestic workers in the United States and what help is being offered to them.

Methods

I will begin my project by defining the term *domestic work*. I will move on by reviewing the 2010 Hispanic population census and identify the relationship between Latina's in the United States wanting to pursue domestic work for their primary source of income. In the second part of my research project I will go further into detail discussing the working conditions domestic workers encounter and how some domestic work cases

can lead to human or child trafficking. In the third part of my project I will list the laws that have been executed, ratified, or revoked. Furthermore, I will discuss the progress support groups, unions, and hotlines that have been established thus far. Finally, I will conclude this paper by revealing the struggles that domestic workers continue to face even after the passing of protection laws for domestic workers.

Anticipations

I anticipate that my results of this project will support the idea that although Latina domestic workers have rights they are still afraid to speak up for themselves due to fear of threats by their employers, doubt in the government, absence support, deportation, and/or lack of knowledge.

What Are Domestic Workers?

The International Labour Organization (ILO) estimates there are at least 52.6 and up to 100 million domestic workers around the world (State Dept). As previously stated the number given by the U.S. State Department is only an estimate and can't be entirely accurate due to the level of secrecy this job entails. A factor such as employers prohibiting domestic workers of communicating with other people plays a big role of why the statistics are not accurate. Furthermore, many people don't know that domestic workers are often neglected and crucially mistreated psychologically, emotionally, and physically by their employers simply because of the job title they have. "In many cases domestic workers are regarded as 'helpers' rather than employees entitled to basic labor rights", claims the Human Rights Watch (Human Rights). However, domestic workers are more than just "helpers" in a home. According to the United Nations Commission of Human Rights Special Rapporteur, Ms. Gabriela Rodriguez Pizarro, she describes a domestic worker/household worker/domestic help as,

"A person employed part-time or full-time in a household or private residence, in any of the following duties: cook, servant, waiter or waitress, butler, nurse, childminder, carer for elderly or disabled persons, personal servant, barman or barmaid, chauffeur, porter, gardener, washerman or washerwoman, and a guard" (United Nations).

Domestic workers in the United States come from all around the world. Many domestic workers in the United States are from a Hispanic descendant. One can make the assumption that with the Hispanic population skyrocketing in the United States, the number of Latina Domestic Workers in the United States will too. However, let us first look at the statistics of the Hispanic population in the United States. According to the 2010 census, "308.7 million people resided in the United States on April 1, 2010, of which 50.5 million or 16 percent were of Hispanic origin" (US Census). Evidently, the Hispanic population has been rapidly increasing. Since 2000, the Hispanic population made up 13 percent of the population. Now, the Hispanic population is 16.3 percent (US Census).

Another fact that will help us understand why so many Latinas choose to become domestic workers is their country of origin. The Hispanic origin that increased the most from 2000 to 2010 has been the Mexican origin, increasing by 54 percent (US Census). Moreover, by knowing the states that have the majority of Hispanics residing in them, it will help determine what states have the most Latina domestic workers and what aid is the state proving for these women. The U.S. 2010 census claims that, "over half of the Hispanic population in the United States resides in just three states: California, Texas, and Florida" (Census 2010). Shockingly, New York came in at number four, Illinois at number five, Arizona came in sixth, New Jersey seventh, and Colorado eighth (Census 2010). Overall, the 2010 Census determined that Hispanics

accounted for over half of the nation's population growth from 2000 to 2010. With the highest percentage of Hispanics in the United States, it is clear to say that Hispanics do play a vital role in the country's population's growth.

Why Women Become Domestic Workers

With the monthly pay of about \$200 dollars a month, many question the reason and driving force behind the millions of women who attain the courage to migrate to a foreign country and work under horrible conditions for such little pay. According to the North Carolina Law Review, "Worker's remittances are a rich source of revenues for their countries of origin, some countries actively encourage their female workers to migrate abroad for domestic work" (Law Review). In other cases the driving force is different. For a poor country, sending domestic workers to other countries to work is a great strategy to balance unemployment problems in their own country while still growing their economy receiving foreign exchange reserves (Swept under the rug). Another reason why women decide to abandon their country and travel thousands of miles to seek employment is simple, they are desperate for money. Their will and desire to help their families financially gives them courage to start a new life away from their family and only hope for the best.

Problems Domestic Workers Encounter

There are many problems Latina domestic workers encounter in the United States due to their vulnerability of moving to a foreign country. A major issue that raises many concerns globally is human trafficking. According to the American Civil Liberties Union also known as, (ACLU), the federal law defines a form of human trafficking as, "The recruitment, harboring, transpiration, provision, or obtaining of a person for labor or

services, through the use of force, fraud, or coercion for the purpose of subjecting that person to involuntary servitude, forced labor, peonage, debt bondage, or slavery" (ACLU-TVPA)". Additionally, the U.S. Department of State estimates that 14,500 to 17,500 people are trafficked into the United States each year" (ACLU). Once again, these numbers are difficult to estimate due to the fact that human trafficking is a hidden crime and victims are afraid to speak up. Additionally, ACLU claims that, "The inequalities women face in status and opportunity worldwide make women particularly vulnerable to trafficking" (ACLU).

These inequalities that women face specifically target Latina domestic workers due to their immigration status. In the United States immigrant women and children are particularly vulnerable to the deceptive and intimidation tactics of traffickers because of their lower levels of education, inability to speak English, immigration status, and lack of familiarity with the United States employment protections. Further, they are vulnerable because they often work in jobs that are hidden from the public view and unregulated by the government (ACLU). The Human Rights Watch states that, "According to ILO, almost 30 percent of the world's domestic workers are employed in countries where they are completely excluded from national labor laws" (Human Rights). Based off these numbers it is crucial to be aware of the high risk of vulnerability, neglect and mistreatment Latina domestic workers have to face.

Therefore, what is actually happening to these women who are forced to work in a foreign country? The Human Rights Watch has conducted many interviews with domestic workers and discovered that, "Domestic workers have reported a barrage and psychological abuse as well as physical violence from their employers ranging from slaps to severe burnings and beatings using hot

irons, shoes, belts, sticks, electrical cords, and other household items. Sexual harassment and violence from recruiters, employers, and employers' family members is also a risk" (Human Rights Watch).

It is crucial to know how the United States Department of Justice defines the violence women encounter. The United States Department of Justice believes that physical abuse is hitting, slapping, shoving, grabbing, pinching, biting, hair pulling etc... It includes rejecting medical care or forcing alcohol and/or drugs upon her. Sexual abuse is attempting to force any sexual contact or behavior without consent. Emotional abuse occurs when an individual's sense of self-worth and/or self-esteem is undermined, or when subjected to constant criticism to diminish their functional ability. Finally, psychological abuse is caused by fear, intimidation, or threats of physical harm to the victim or their family, children or friends. Destruction of property and forcing isolation from family and friends is also included (U.S. DOJ).

Testimonials

Otilia Luz Huayta, a Bolivian mother, arrived with her daughter to the United States to work as a domestic worker. Huayta decided to share her story with ACLU after being rescued by the Casa of Maryland. Otilia Luz Huayta states, *"My daughter and I came with a woman diplomat and signed the contract in Bolivia, not the United States. My salary was \$200 a month and my daughter's was \$15 a month. They mistreated me psychologically. They yelled at me and my daughter. My workday schedule was from 7am and didn't end until 11:30 or 12:00 at night. The food was counted. They didn't account for us. My room was a hallway. What made me very afraid was the son of my employer who always walked around through the hallway half-naked. I was rescued by CASA of Mary-land on June 2nd. The diplomats refused to give my things back.*

My boss kept my passport at her work. It was something very painful, hurtful... I have felt very bad because of all the things that happened" (ACLU, 2007).

Araceli Saucedo was born in California but moved to Mexico when she was a child and returned to the U.S. after getting married. Araceli shared her story with the reporter, Anna Blackshaw and claims that, *"We are all intelligent, but sometimes circumstances define what you do. What I see is that nobody wants this job, that it is seen as the lowest job you can get. People see you just as a housekeeper. I almost immediately began having trouble with my supervisor. I know that she hurt me psychologically because when I would see her I would shake and get cold and sweat. In my country I had dreams of working in a bank or maybe being a lawyer, but when I came here, that all changed"* (Blackshaw).

Sebastiana Flores was born in El Salvador and has worked as a housekeeper in the United States for nine years. Ms. Flores said her health was at risk due to the harsh chemicals she was required to use when cleaning (Blackshaw). *"When I told my former supervisor about this, she wouldn't change the chemicals, and I kept getting worse"* stated Ms. Flores. Additionally, she shared her thoughts toward her employer and said, *"She has told me that I am old and useless to her. I feel terrible because she treats us worse than animals. Initially I would bow my head down and wouldn't say anything. But little by little I have been meeting with people I can talk to about this, and many of us have decided to fight back. We are afraid, but I am tired of being treated like this. I want to fight"* (Blackshaw).

What Is Being Done?

The horrific stories brave Latina women have shared about their experience as domestic workers leave one in shock. It is unbelievable that such cruelty can happen in a country that prides itself on freedom. The question that

comes to my mind after reading such testimonies is what exactly is being done to stop such brutality and protect these hard-working women. Although not all Latina domestic workers are U.S. Citizens or permanent residents, they still deserve protection rights because they are human. Luckily, there are some judicial remedies that are available to victims of trafficking. The Trafficking Victims Protection Act of 2000 also known as, TVPA subjects traffickers to fines and/or detention as a result of criminal prosecution. (ACLU-TVPA22). Additionally, “It criminalizes trafficking with respect to forced labor, involuntary servitude, peonage, and slavery. The TVPA also makes it a criminal offense to confiscate a victim’s documents in furtherance of a trafficking crime” (ACLU-TVPA22).

Along with the punishments the TVPA places upon human traffickers, trafficking victims are also offered civil remedies from the government. Victims have the ability to seek compensations of economic losses and suffering by filing a civil claim against their trafficker for trafficking violations under a civil cause of action added to the TVPA in 2003 (ACLU). Fortunately, the United States also offers relief to trafficking victims by making them qualified to obtain services offered to refugees in the United States. These services include, cash assistance, food stamps, Medicaid, and Supplemental Security Income (ACLU-DOL24). Moreover, some government-funded programs and services are also available to trafficking victims such as, crisis counseling, short-term housing assistance, and mental health assistance for their safety (ACLU-DOL24).

As previously mentioned, many Latina domestic workers or victims of trafficking are afraid to speak up due to the fear of deportation. Traffickers threat the victims through deportation, document confiscation, debt, or restriction of communication (Polaris

Project). However, there is some immigration relief offered to these victims as well. For instance, the continued presence provides temporary immigration relief to victims of trafficking allowing them to lawfully remain in the United States to effectuate trial of their traffickers (ACLU). But this protection is provided only in one-year increments.

Trafficking victims can also apply for a T Visa or a U visa. However, applicants must be willing to cooperate with any requests for assistance in the investigation or persecution of any acts of trafficking (ACLU-Id25). In addition, trafficking victims have the right for Asylum relief. “If trafficking victims fear they may be prosecuted if returned to their home country (ACLU) then an Asylum relief is the best choice for them. Though, it is important to note that according to (ACLU) only 5,000 T visas and 10,000 U visas are available annually and these limits do not apply to family members” (ACLU).

People throughout the world recognize that domestic workers need protection and support. Consistent with this recognition, in June of 2011, the International Labour Organization adopted the International Convention on Decent Work for Domestic Workers. The purpose of this convention is to dictate that domestic workers are allowed the same basic labor rights provided to those employed in the formal economy (Polaris Project). Furthermore, in November 2010, the Domestic Worker Bill of Rights was enacted in New York. This law mandates an 8-hour legal workday and overtime after 40 hours for live-out domestic workers and 44 hours for live-in domestic workers (Polaris Project). California also recently passed a Bill of Rights for Domestic Workers. The California Domestic Worker Bill of Rights went into effect in January 2014. Finally, Governor Brown recently signed SB 666, which helps enforce labor laws prohibiting employers from using

immigration-related threats (California Legislative Information).

Additional Support

In addition to laws that afford protection to potential victims of human trafficking, domestic workers can also receive support and assistance from hot lines. The hotlines available to victims of human trafficking include:

- The Trafficking and Worker Task Force Complaint Line
- Trafficking Information and Referral Hotline of the Department of Health and Human Services
- Wage and Hour Division of the Department of Labor Hotline
- EEOC Hotline, and the
- ACLU Women's Rights Project Hotline

The Domestic Workers United, Domestic Workers Bill of Rights Campaign and the ACLU's Polaris Women's Project are just a few of the organizations and unions that advocate for the rights of domestic workers. These groups have slowly made progressive with the help and courage of Latina domestic workers speaking up for their rights. However,

there are still other struggles that interfere with Latina domestic workers becoming free of "modern slavery."

Struggles Domestic Workers Continue to Face

Although support is offered to domestic workers, it is still not enough. Margaret Huang, the U.S. Program Director claims that, "Unfortunately, those who come forward to seek justice for their abuse find that their bravery is without reward" (ACLU). The reason for this problem is skepticism of the government. These women struggle to trust the government because they are afraid of deportation if they come out of the shadows. Another reason why women do not seek for help is simply because they don't know how. Since their lack of communication with society is absent they are not aware of their rights. Additionally, women are

Concluding Remarks

These women left their homes, families and everything they knew to pursue life, liberty and happiness. Unfortunately, they were not able to find it in the places they worked. These three women and millions of domestic workers like them continue to face disgusting violations from their employers and disturbing economic and psychological abuse from them. If we sincerely believe in opportunity and giving people a chance at a better life, we should ensure that working conditions protect their right to pursue that better life, not allow the work environment to abuse and destroy them.

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Nietzsche's Insight: Conscience as Amoral

Kyle Tanaka

“Whether you turn to the right or to the left, your ears will hear a voice behind you, saying, “This is the way; walk in it.” (Isaiah 30:21) The Bible, Aristotle, Aquinas, Rousseau, and many others in the history of both Western religion and philosophy have described the phenomenon of being guided by a voice. We generally call this “conscience.” Sometimes conscience is interpreted as the word of God, sometimes as the voice of human reason, but it is almost always a voice telling one what one should do. Conscience has had a close association with morality, or the “right” or “appropriate” way of doing things, and we often call it a “failure of conscience” when an individual commits an atrocious act.

This paper will argue that conscience is not primarily a moral guide, but instead a capacity that is responsible for new ways of thinking and living. One way this manifests is in regards to our moral beliefs, but this is only one form of a more fundamental phenomenon. I will ultimately conclude that conscience’s role and importance goes beyond merely the realm of morality and right action.

This analysis will primarily draw from the works of Friedrich Nietzsche. Nietzsche offers a detailed examination of conscience, though he is certainly not the first thinker in the Western tradition to do so. This paper will not attempt to give a history of the concept, however. I am examining Nietzsche in particular because he attempts to save conscience from its moral trappings and emphasize a more fundamental function to conscience. For Nietzsche, conscience is the awareness of our promise to adhere to certain values. The first section of this paper will focus on Nietzsche and the second on the philosophical implications of his ideas.

Nietzsche on Values and Conscience

Human values are a central focus of Nietzsche’s thought. What we deem good and bad, the decisions we make, and how we live our lives are all based on the values we hold. But how are we to evaluate the value of values? Nietzsche’s answer is that values are always the expression of a kind of life, and each kind of life forms values based on one’s relationship to the world. Values are thus always evaluated in terms of whether they inhibit or enhance a particular kind of life. According to Nietzsche, we always posit values; he even points out that we would rather invest in values that devalue ourselves and our ways of life (through negation, nothingness, nihilism) than defer willing any value at all. (*GM III*, 1) Regardless of what particular values we hold, however, what reminds us of what we value is our conscience. For Nietzsche, conscience does not merely tell us what is right or what is wrong; conscience fulfills a much more fundamental, much more important role: conscience is our awareness of responsibility.

Conscience, Bad Conscience, and Responsibility

Nietzsche’s most in-depth analysis of conscience occurs in *On the Genealogy of Morality*. Despite the title, however, there is only a tenuous connection between conscience and morality. It is important to note the ways in which Nietzsche uses the term “conscience” in this work. How Nietzsche discusses conscience—the way and context in which he does so varies from section to section—bears on his message.

This is because there are actually several versions of conscience for Nietzsche. In the text, he refers to them as “conscience” and “bad conscience,” but for clarity, I will use “good conscience” and “bad conscience” to refer to each type specifically. Nietzsche’s analysis of conscience in *Genealogy* starts with good conscience since it represents the positive form of conscience; it posits values meant to express life as fully as possible. Later, Nietzsche will describe bad conscience as a kind of corrupted good conscience, where what once was an ability meant to express human powers becomes a way of containing and repressing certain kinds of human drives.

Nietzsche describes good conscience as a capacity that has arisen out of the development of humankind. It is a late development, but nevertheless an important one. He notes: “The proud knowledge of the extraordinary privilege of *responsibility*, the consciousness of this rare freedom and power over himself and his destiny, has penetrated him to his lowest depths and become an instinct, his dominant instinct...this sovereign human being calls it his *conscience*.” (*GM II*, 2) Good conscience is not merely an ability—it is an instinct and a privilege.

To instill this awareness of responsibility requires overcoming a tremendous force: forgetfulness. To be responsible requires promising to adhere to a certain vow, commitment, etc., but to be able to fulfill such a promise requires, first and foremost, remembering that a promise has been made. Forgetfulness is in direct opposition to such a commitment. As Nietzsche points out, “Forgetfulness is not just a *vis inertiae*...but is rather an active ability to suppress.” (*GM II*, §1) We generally think of forgetfulness as failing to grasp something in such a way that it “sticks,” but here forgetfulness is something active, not merely a failure to remember. Nietzsche points to everyday experience to justify his claim; in everyday experience, we

forget quite a lot—sensations, feelings, experiences, etc. As Nietzsche puts it, forgetfulness “[Shuts] the doors and windows of consciousness for a while,” (*GM II*, §1) giving us a respite, a chance to step back and take a breath. As we go about our day, much of what we sense never enters our consciousness; we are often unaware we sensed anything at all. This is why Nietzsche characterizes forgetfulness as something active: it actively suppresses the background noise of everyday experience, and without it, we would be overwhelmed with the totality of sensations given by experience. Thus, it is necessary to make that which needs to be remembered have sufficient weight to counter the power of forgetfulness.

To do this requires a way of producing an experience that is not easily forgotten, and Nietzsche claims this was done with experiences of pain. “When man decided he had to make a memory for himself, it never happened without blood, torments and sacrifices.” (*GM II*, 3) Pain is used as a means of making man into an individual that will remember his promises. Of course, it is not simply abstract pain or punishment that forms a man's memory: it is associating pain with the failure to adhere to a promise. When man promises, implicit (or explicit) in the agreement is the threat of harm should the promise be broken—otherwise the promise means nothing. By putting something of man's own at stake in the promise, it becomes highly important to him, important enough to be remembered. It is out of this threat that the awareness (or perhaps, more accurately, the remembrance) of responsibility arises.

This description may raise an objection, however. Namely, if a promise is always made between two individuals, and if individual A is to be punished for forgetting his promise, then individual B must remember the promise so that individual A can be appropriately punished. In other words, there must always

already be one individual who already is capable of remembering the promise in every promise; the account of the origin of this memory of responsibility thus presupposes what it is trying to explain. There are two ways to respond to this criticism. First, the key elements here are man remembering some action and being able to associate some experience of pain with that action as its effect. For example, someone may choose to not gather food, starve later, and then see their current starvation as a result of their earlier decision. In this way memory can be reinforced without another individual. We could also say that an individual can make promises to himself. To use the same example, one could promise to gather food to oneself, break that promise, and then see the starvation that results as the effect of breaking that promise. Again, no other individual is needed here.

Out of this painful process, promises gain sufficient weight to counter forgetfulness. This proves to be the inception of Nietzsche's first version of conscience, good conscience. Good conscience is held by what Nietzsche refers to as "the sovereign individual." He states: "Society and its morality of custom finally reveal what they were simply *the means to*: we then find the *sovereign individual* as the ripest fruit on its tree, like only to itself, having freed itself from the morality of custom." (*GM II*, 2) Given that this essay is asserting conscience is *not* primarily a moral phenomenon, caution is needed here. What exactly does Nietzsche mean by "morality" and "custom"? In *Daybreak*, Nietzsche defines morality as: "Nothing other than obedience to customs, of whatever kind they may be; customs...are the *traditional* way of behaving and evaluating." (*D I*, 9) Morality is not anything like a commandment from God, activity of the soul in accordance with virtue, or an imperative based on human reason. To say the sovereign individual has freed himself from the morality

of custom means only that the individual has been freed from obedience to tradition. But if society's "morality of custom" is meant to make man adhere to tradition, it seems odd that what we get is not a truly predictable, responsible man, but instead one who defies his responsibilities to the tradition and history that created him. In fact, the sovereign individual is responsible, and is predictable—not to his history or culture, but to himself. The sovereign individual has his own values, and his predictability and responsibility manifest in his ability to adhere to the rules which he sets down for himself. The awareness of this responsibility to one's own values constitutes good conscience.

A similar process occurs for the other version of conscience, bad conscience. Like good conscience, bad conscience starts as a response to tradition. Unlike good conscience, however, bad conscience does not break free of tradition and posit its own values. Instead, with bad conscience man's instincts are repressed and turned against him. For Nietzsche, bad conscience first appeared when man "finally found himself imprisoned within the confines of society and peace." (*GM II*, 16) For Nietzsche, we are fundamentally guided and motivated by innate desires and drives. Our drives take a variety of forms and vary from individual to individual, but our basic way of existing is one of expressing ourselves and our power.

One can very easily imagine this being the case for an individual living on an island; the only limits on his behavior, what he is willing to do and what he is not, are those he himself sets—no one else is there to tell him "No." But society does not work like this; we have standards, rules, norms, and laws. The awareness of the promise to adhere to these aspects of society, a power that had to be reinforced in man, may be a problem if it clashes with one's fundamental drives.

If we feel driven to do something that is forbidden by our culture, our desire threatens our ability to keep our promise to our culture to stay within its boundaries. When one makes a promise to another individual, there is room for outside expression—what one does outside the terms of the agreement is one's own business. When one makes a promise to culture, there is no “outside the agreement.” Acting in a way deemed illegal by that culture is illegal regardless of where the crime is committed. As a result, the drives man would normally have that go against the terms of the agreement are bottled up and repressed. This is a problem, because for Nietzsche, instincts do not simply dissipate when they find themselves repressed or denied: “All instincts which are not discharged outwardly turn inward.” (*GM II*, §16) The forbidden instincts have to find some route by which they can express themselves, and if that route cannot be outer, then it has to be inner. The destructive tendencies of man, “Animosity, cruelty, the pleasure of pursuing, raiding, changing and destroying—all this was pitted against the person who had such instincts.” (*GM II*, §16).

This is, essentially, man fighting against himself. On the one hand, he has some drive to express himself, to live his life to the fullest extent he can. But on the other, by existing in a culture with others, he has made a promise to adhere to certain rules. This is the origin of bad conscience: man pitted against himself. Nietzsche still uses the word ‘conscience’ because bad conscience is structurally the same as good conscience: there is still a promise and still the association of pain with the breaking of the promise. But this version of conscience has been corrupted; what once was a power that allowed one to express the power of promising has become a way to control and constrain man.

It should be stressed that though man is the inventor of bad conscience, it is only because of others that one’s conscience is “bad.” Man

wants to break his promise because he has some drive that is repressed, but his awareness of his responsibility to keep that promise makes him feel guilty. Or, if he does break his promise to culture and does what he wants, he still feels guilty, since his bad conscience reminds him of his transgression. Bad conscience is a constant reminder of the promises one has made to one’s culture and the fact that one wants to break (or has broken) that promise. “Everything that hurt the herd, whether the individual had willed it or not, gave the individual pangs of conscience.” (*GS III*, 117) Bad conscience is the voice or presence of culture (“the herd”) in the individual and repressing the drives of that individual.

To trace the development of both good conscience and bad conscience from their origins, then, we first have individuals who exist in some basic relationships to each other, but who lack the memory to keep promises, so any kind of structured society based on laws or traditions is impossible. But then we find a few individuals who perhaps were unfortunate enough to suffer due a bad memory, but fortunate enough to survive. These individuals have a better memory than others, and realize that they are capable of both making and keeping promises. From here, we gain the first version of conscience, which posits its own values and keeps them firmly in mind. However, we also gain the second version of conscience, bad conscience, which lacks the strength to posit its own values and so has to repress certain aspects of itself in order to survive.

Development, Evolution, and the Role of Conscience

Giving an account of conscience’s role in Nietzsche’s thought is not an easy task. The prior section indicated that conscience is not merely one phenomenon for Nietzsche, it has two forms: good conscience and bad

conscience. The question then is: does conscience have the same purpose in both its forms or does its purpose differ in each version? This section will argue for the former position; conscience in either case posits values that set new limits on what we can and should do. However, more concretely, good conscience posits values primarily aimed at the fullest expression of life, while bad conscience posits values to inhibit or repress those ways of life it despises.

The previous section referred to “society,” “culture,” and “tradition,” but did so in somewhat loose, vague terms. After all, the individuals with good conscience or bad conscience are themselves part of society, not somehow separate from it. To make matters simpler, let us assume that society is divided into two massive camps, those with good conscience on one side and those with bad conscience on the other. We are, of course, aware that such a division is far too simple and fails to see nuances, but for the purposes of an initial explanation, it will help make matters clearer.

Since good conscience is concerned with the positing of new values and adhering to those, the good conscience camp will naturally posit its own values, while the bad conscience camp, which is essentially reactive, lacks the strength to posit its own values and so merely takes on the values posited by the good conscience camp. But, of course, the interests, strengths, and desires of those in the bad conscience camp will not be completely in sync with those of the good conscience camp. Unfortunately for those in the bad conscience camp, this means the unacceptable drives must be repressed, and this is precisely what constitutes their bad conscience. To cope with their situation, we would naturally assume those in the bad conscience camp might have a variety of responses: resignation, rebellion, trying to rise to the level of the “strong,” perhaps even taking on the mentality of “I

deserve this punishment.” These may all be true, but Nietzsche emphasizes one mode of response in particular: subversion. With subversion, the bad conscience camp rejects the values handed down by the good conscience camp, and instead inverts their values: what was previously good becomes bad, and what was once a sign of strength is now considered weakness.

With this shift in the moral axis, those with good conscience are now at a disadvantage; what previously was their greatest strength is now considered their weakness. One might object that a revaluation of values does not mean the structure of power has changed; those with bad conscience may still be oppressed. This is true, and to respond to this criticism we must add a bit of depth to our model. Since those with good conscience are concerned with positing their own individual values, some of these values may line up with those of other individuals, but given the uniqueness of each individual, there is significant room for conflict and contradiction. As such, the good conscience camp is not quite as homogenous as we first imagined; it is in fact rather fragmented. Further, what reason do those with good conscience have to take those with bad conscience seriously? After all, these are individuals who are too weak to posit their own values. This, combined with the fact that those of the good conscience camp are more concerned with living in accordance with their own values than what others may think, leads to an underestimation of the resentment building in the bad conscience camp.

This set of circumstances sets the stage for a massive upheaval of values. The members of the bad conscience camp now have their own values, their own traditions—and they are antithetical to those previously posited. As these values supplant the old ones, a new culture is established. Now those who previously had a good conscience find their ability to live as they wish repressed. In other

words, they gain a bad conscience. Does this mean that a complete reversal has occurred? Well, no. Good conscience is concerned with positing values for the fullest expression of life, but the values posited by the bad conscience camp are primarily concerned with repressing another group's set of values; they are essentially reactive.

But we take as solace that out of this process there is still a possibility for the positing of new values, rather than the habitual overturning of values. This is why Nietzsche says: "The strongest and most evil spirits have so far done the most to advance humanity: time and time again they rekindled the dozing passions." (GS I, 4) Evil, for Nietzsche, does not mean an individual who is cruel, sadistic, or manipulative, but instead an individual who posits new values that overthrow the old system of values. It must be stressed that this is done not to repress the old values and those who held them, but primarily as an act of creation; the act is done in accordance with one's good conscience. These are the kind of individuals who offer something truly new, who are concerned with the affirmation of life rather than its negation and repression. Unfortunately, as we have seen, even when new values are created without intending to harm, they will nevertheless repress some other individual's ability to live fully, and so sow the seeds of bad conscience once again.

Out of this whole process, we see two tendencies in man. First, we see the tendency towards obsessive, vengeful stagnation. Values are fundamentally the same, but they can be pieced together differently. If one envisions two enemies trying to piece together a puzzle (we could perhaps call this puzzle "morality"), their fight over the pieces may break apart the puzzle again and again, and who knows how long it will take them to finish. In their back-and-forth struggle, they may not notice they are missing a piece of the puzzle. This option is bleak, for it means our

future is just a constant struggle until we reach a state of complacency ("We have done the best we can with what we have"). If it prevails, we become what Nietzsche calls "the last man," a breed of individual who has given up on the possibility of there ever being anything better, and therefore the current state of things is the best possible way of being. On the other hand, we could have the manifestation of "the *free spirit* par excellence." (GS IV, 348) Since bad conscience arises out of repressing some way of living, if we are strong enough and flexible to adapt and change as needed, bad conscience need never come into the world at all. Conscience, in general, is thus a power that carries with it both the possibility of halting human life and progression, and simultaneously a power that can elevate us to new ways of thinking, acting, and living.

Philosophical Implications

What does this mean for us, in terms of how we think about conscience and how we think about the world? To summarize the previous sections, Nietzsche describes conscience as awareness of one's ability to promise, either to oneself or to others, which is most important in regards to the promises made to culture. Ultimately, because of conscience, we are able to posit values that determine what is acceptable and good, and what is forbidden and bad.

What Nietzsche emphasizes is the role of culture in determining how we live. Culture sets the values according to which we either must adhere or suffer the consequences if we decide to break free. What is the norm, what is expected of us, may clash with the way of living that is best for us, or even what would be a better way of living for society as a whole. As such, we need a way to reevaluate and overturn what society has prescribed as the way we should do things.

This is the role, purpose, and function of conscience. Conscience enables us to posit

new values, new ways of thinking and living. Conscience is how we are able to grow, evolve, and change as a species. Unfortunately, conscience is essentially a kind of rebellion. Good conscience posits its own values, regardless of what values one's culture holds, and in doing so rebels against established values. This means that what conscience posits may face opposition from the mainstream way of doing things. We can see this in the growth of new views and ideas in select disciplines, the creation of new disciplines, the evolution of politics and political views, and the advancement of rights for human beings either in select minorities or for humanity as a whole.

Ultimately, we cannot really say that one should "always listen to your conscience," or "let your conscience be your guide." Since conscience does not posit linear, progressive

improvement, it is not necessarily always better either for us or for others than what is already in place. However, we cannot say for certain in advance what the results of positing a new way of thinking or set of values will be.

What is certain is that conscience fills a role far more important than that of mere moral guide. The evaluation of morals, rethinking what is right and wrong, is certainly a significant aspect to human behavior, and the conclusions we draw have a significant impact on how we think about the world and decide what is important. But this is merely one of the ways conscience makes itself known; its influence extends far beyond the realm of mere morality. Conscience is what makes possible the development of human ideas, human actions, and human ways of life.

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California as a Sample Site: How Localized Honeybees Can Help Make Predictions of Nationwide Populations

Philip Gauthier

Through many years of intense labor, California has become one of the more productive agricultural areas in the world. The more prominent agricultural exports from the state include almonds, strawberries and decorative flowers, which represented a total value of \$6.8 billion in 2011 (Tolomeo, 2012). While these crops grow successfully on their own, the quantity and quality of their yield is dramatically improved with the addition of pollinators (Yang, 2006). While there are a number of feasible pollinators, one of the more popular is *Apis mellifera*, the western honeybee.

Why do certain crops need pollinators? Pollination is the process plants use to reproduce. A plant is pollinated when pollen from one plant is placed on the carpel of another. Some plants can self-pollinate, while others use wind and gravity to move their pollen around (Green, 2012). When pollination depends on wind, gravity or self-pollination methods, pollen grains are usually restricted to a relatively small area to which they can travel. By introducing pollinating insects, pollen grains can travel over much larger distances and pollinate plants farther away. This process of mixing helps promote genetic diversity in plants – a trait that is extremely desirable. Increasing the genetic diversity in a population of plants increases the size of fruit and leads to higher levels of resistance to diseases (Booy et al, 2000).

Honeybees and other pollinating insects contribute to pollination by flying in to flowers in search for nectar – a sweet liquid produced by plants for the sole purpose of attracting pollinators. When honeybees land on the flower of a plant to gather nectar, they brush up against strategically placed reproductive organs like stamens. Stamens are tiny branch-

like structures with pollen grains on the tips. Once the bee has gathered its fix of nectar, it flies to another flower to gather more. On this next flower, the bee rubs up against more reproductive organs, this time transferring pollen to the stigma, where it eventually fertilizes an egg and creates a seed for a new plant (Green, 2012).

Trouble with Honeybees

While honeybees are considered beneficial and their presence is welcomed, there are other organisms that are not greeted with such open arms. Many of the insects that visit a plant are predatory or herbivorous in nature, and cause more harm than good to the plant. Some plants have evolved their own self-defense mechanisms, while others are left exposed to threats. For this reason growers use synthetic pesticides, many of which are designed to be generalized killers. The number of different species that can pose a threat to a plant at any given time is astronomical, so growers can have a hard time identifying exactly which pest is causing their ailments. A simple way to guarantee the elimination of all insect pests is to attack a feature that all insects possess – the central nervous system (Vijverberg, van der Zalm, & van den Bercken, 1982). By using pesticides specifically designed to attack and over-stimulate the nervous system, growers can ensure that their insect pests are being controlled. While this system seems like a great solution, problems may arise when pollination season comes around. Pollinators (including honeybees) may come in contact with pesticides or their residues, which can lead to death. While there are application timing systems in existence to help prevent the death of vital pollinators, these systems may not be used by small-level growers, or may be

used incorrectly (*UC IPM* pest management guidelines: Almond, 2012).

For many years, honeybee colonies have been decreasing in size and richness. There are a large number of factors that may contribute to honeybee deaths, including cell phone radiation, disease, global warming, and accidental pesticide exposure. While it is true that pesticides definitely do play a role, they cannot take full blame for the deaths of millions of bees across the country. Finding a correlation between honeybee deaths and use of pesticides can help to serve as a starting point in saving the pollination and honey industry in the United States.

Using California as a Model for Nationwide Population

On a nationwide level, the number of honeybee colonies used in honey production was 2.6 million for 2012 (United States Department of Agriculture, 2013). Huge proportions of these colonies are migratory, and are transferred all around the country as the seasons vary. Tracking exposure of these bees to different threats as they spend their time in various locations can be mind numbing. Rather than examine the entire population, California's honeybees can be used as a sample to make inferences about the entire nation's population of bees. Why use California's honeybee populations? As of March 2013, California is home to the second largest number of honey-producing honeybee colonies, second only to North Dakota (United States Department of Agriculture, 2013). Because of this large share of the nation's honeybees, it can be predicted that California's populations will accurately represent those of the entire nation. Another reason California is ideal for investigating pesticide usage effects is the high level of regulation and legislation around pesticide use in the state. Any correlations or information gathered by analyzing trends in California can be extrapolated to the national level since federal regulations affect all states, and California

places more stringent levels of regulation on pesticide use than other states. Because California's lawmakers have strong environmental interests, online databases have been created that can generate detailed reports on specific applications of pesticides. Using California's detailed records, correlations can be determined within the state, and then extrapolated to the country as a whole.

Methods: How Should It Be Done?

Because the research project at hand has multiple parts and dimensions, it will require large amounts of numerical data from several different sources. To begin, data will need to be gathered on population sizes of honeybee colonies that are native to California. These will then be compared to data on population sizes of honeybee colonies nationwide. If California's population and the nationwide population follow a similar trend, then it can be determined that California can be used as a sample for analysis, and the results will accurately reflect nationwide trends.

Numerical data on population sizes can be gathered from *Honey*, a publication by the National Agricultural Statistics Service. *Honey* is published annually at the beginning of the calendar year, from 1976 to present day. All publications are archived and available online. Within these publications is data on number of honey-producing colonies, yield per colony, and production in pounds. The data is broken down by state and offered as a nationwide statistic. For purposes of the study, only the number of honey-producing colonies will be needed. Data would be analyzed on a graph, with year along the x-axis and number of colonies along the y-axis. California colonies and national totals would be plotted as separate lines on the same graph, and similarities between the lines would be examined to determine whether or not the two datasets fit each other. Statistical analysis using Analysis of Variance (ANOVA) could similarly be used to search for a relationship between the two

sets of data, by comparing a trait such as annual percent change in size.

Once it has been determined that California's honeybees are representative of nationwide populations, statistical analysis can begin between colony numbers and usage of specific pesticides. Using databases created by the California Department of Pesticide Regulation, numerical data can easily be gathered about the usage of the most popular pesticides in modern agriculture. Because each chemical has differing properties and levels of application, it can be predicted that some pesticides will show higher levels of relationship than others. Once each pesticide's use within the state has been individually analyzed for a relationship with California's bees, a relationship can be inferred on a nationwide level. Where exactly is all this pesticide data coming from? Thanks to the large level of legislation in California pertaining to pesticide use, data on each pesticide group can be readily gathered from CALPIP, a database service hosted by the California Department of Pesticide Regulation. CALPIP (California Pesticide Information Portal) contains data from the years 1990-2011, and can be sorted into agricultural or non-agricultural applications. The portal also allows for filtration by location of application and what crop the pesticide was applied to. Data will be screened to provide datasets for only agricultural applications of the specified pesticide on high-value crops, throughout the entire state. Once the data has been gathered, pesticides can be compared to find which one fits best with population trends, and therefore has the largest effect on California's honeybee population. Once a relationship is established between pesticides and California's honeybees, inferences can be made about the effects of pesticide use on a nationwide scale.

Beyond statistical likelihood between California and the United States, individual state legislatures regarding the use and/or

regulation of pesticides should be examined. While it is being generally assumed that California pesticide regulation is stricter than other states, thorough examination of individual state laws needs to be performed. Furthermore, federal laws should be examined, to determine an absolute baseline level of restriction that can be imposed on those states that do not implement their own individual laws.

How Sampling Is Useful

The evidence of statistical likeness between California and the whole nation can also open new shortcuts to fast examination of colony health. Patterns of honey quality can be compared with patterns of survival rates to determine whether honey is a bio-indicator of bee health. If a correlation is found using California's immense datasets, then studies can be carried out quickly in other parts of the country under the same general assumption that honey quality indicates overall colony quality. A simple examination of honey quality from an individual colony could be used as a starting point for inferring the health status of the aforementioned colony.

Concluding Thoughts

Why so much concern over honeybees? Even though it may seem like a menial and pointless question, it is one that affects almost every citizen in the United States. Around 250,000 flowering plants rely on bees for their pollination, and many crops see their yields increased by the presence of honeybee pollination (Benjamin, 2008). Although modern genetic science and GMO corporations are working on creating species of plants that do not require pollinators, a collapse of honeybee populations in the near future would spell disaster for human food supplies, as well as many animals that feed on fruits and nuts in the wild. Monitoring patterns and correlations between pesticide usage and honeybee populations in California could help to lay ground rules for new legislation and guidelines

on pesticide usage nationwide, and slow the downfall of honeybee populations all over the country. By avoiding meltdown of the honeybee community, we could save the food supply, as well as one of the most amazing organisms on earth, *Apis mellifera*.

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Rapid Detection and Identification of Bacteria in Milk Products by Matrix-Assisted Laser Desorption/Ionization Tandem Mass Spectrometry (MALDI-MS/MS)

Nyesa Enakaya

It is essential to be able to identify potentially dangerous pathogens. Although *Bacillus thuringiensis* bacteria are not harmful to humans, a closely related bacteria *Bacillus anthracis*, which is known as anthrax, is capable of causing death [1]. Anthrax exposure has been documented on various occasions; a highly publicized instance occurred 2001, and of the twenty-two people infected, five died [1,10, 11]. It took multiple days to confirm that the anthrax exposure took place [11]. Since such a long period of uncertainty is counterproductive for effective treatment of those exposed, a fast and reliable method for detection is needed. Having the ability to identify anthrax spores and other pathogens is of great importance.

The method that we are using is fast, relatively cheap, does not create much waste, and most importantly, the results are reliable and can be supported with a high level of confidence. Through our research, we expect to be able to readily identify bacteria in the *Bacillus* genus through matrix-assisted laser desorption/ionization (MALDI) mass spectroscopy (MS). A highly used technique in proteomics is peptide mass fingerprinting (PMF). PMF can be used when certain proteins are species-specific; that is, they are only found in a certain species. We can use these species-specific proteins to identify the source of a protein.

Peptide mass fingerprinting is a technique used to identify proteins with ease. In this method, a protein is digested with a protease [8]. A protease is an enzyme that breaks down proteins into smaller peptides [12]. There are many different types of proteases; each breaks

a protein at a specific amino acid. For my research, we use the protease trypsin, which breaks proteins at lysine (K) and arginine (R). After the tryptic digestion, the next step is to determine the peptides through mass spectroscopy. Mass spectroscopy provides the molecular weights of a molecule with very little sample needed. A sample is bombarded by high-energy electrons, which break the molecules into fragments [12]. A plot is made by graphing the abundance versus mass of the fragments. The molecular weights of the fragments and the protease are then used to screen in a database to determine the unknown protein from which the fragments originated. Peptide mass fingerprinting provides a distinct signature of a protein; an amino acid sequence can be obtained from daughter ions in a mass spectrum, these masses are then matched against a database to identify the protein [5]. When we ran our digested peptides and fragmented peptides through the database, we received a positive match for *B. thuringiensis* spores.

After testing the method and showing that the results were accurate, the next step was to test how the results were affected when we place the spores in an organic matrix instead of water. We spiked the *B. thuringiensis* spores into milk to see if we could replicate the same results that we got from placing the spores in water. Attempts to rapidly identify *Bacillus thuringiensis* sbsp. kurstakin with proteomics through MADLI-MS proved to be difficult in milk even though it had been possible in DI water. Species-specific peptide peaks seen in .1 M KOH after a 20-minute tryptic digestion were not seen when digested with milk nor when digested spores were spiked into milk. It

is believed that ion suppression took place and that the milk proteins hindered the *B. thuringiensis* peptides from ionizing. Instead of focusing on peptides for identification, the focus shifted towards using peaks that were seen in DI water, KOH and milk. It is possible that a lipopeptide discovered in 2000 can be used as a biomarker for the *Bacillus* genus but not for species-level identification [7].

Bacillus thuringiensis spores have demonstrated antifungal properties; during sporulation, it produces insecticidal δ -endotoxin proteins and is often used as an active ingredient in insecticides [7 & 9]. The kurstakin lipopeptide, which was noted to be washed off spores with multiple organic solvents, is likely located on the outside of the spores [6 & 7]. Kurstakins has also been detected in six strains of *Bacillus thuringiensis* and *Bacillus cereus* [2]. While kurstakins is not species-specific, it may be a particular to the *Bacillus* genus. Through our future work, we intend to show whether kurstakins is specific to the *Bacillus* genus. If it is, our work could be used as a quick check for food producers to

check whether *Bacillus* bacteria are in their products.

Methods and Procedures

Ten milligrams of *Bacillus thuringiensis* spores were prepared in 100mM KOH at pH 13. They were shaken for 1 minute and allowed to sit for 19 additional minutes so that the δ -endotoxin, *B. thuringiensis*' protein toxin, will solubilize [11]. The pH of the spores was adjusted to eight with .1% trifluoroacetic acid. A 100 μ L aliquot of immobilized trypsin (Lot # NJ178775A) in 100mM of NH_4HCO_3 was prepared and centrifuged for three minutes at 10,000 X g; the supernatant was then removed. The trypsin was washed with NH_4HCO_3 two additional times. The trypsin was added to the spores and allowed to digest for 20 minutes. The digestion was ended by centrifuging the mixture for three minutes at 10,000 X g. The peptides were spotted on a MALDI plate after being desalted with a C_{18} zip tip. The MALDI matrix, consisting of 70% acetonitrile, 1% trifluoroacetic acid and 10mg alpha-cyano-4-hydroxy-cinnamic acid, was then spotted on top of the sample.

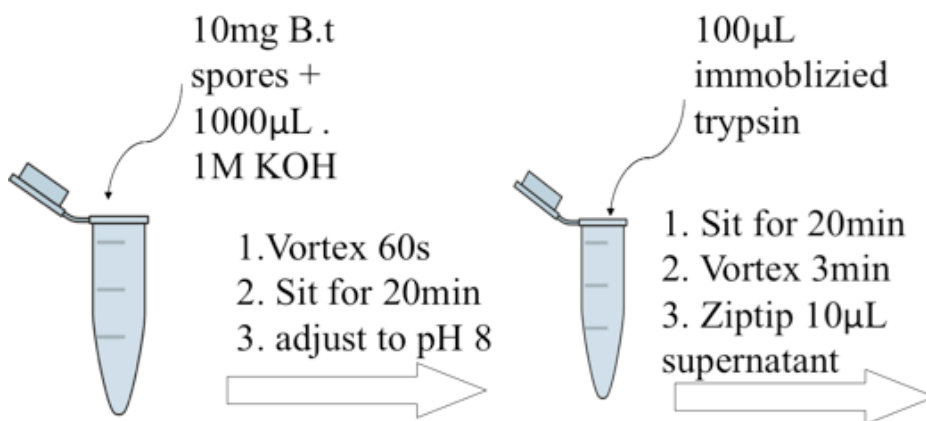


Diagram 1: Flowchart representation of trypsin digestion
For end result, see Figure 1 below.

Out of 233 species-specific peptides, 56 of them proved to be specific to the *B. thuringiensis* toxin. Of these 56, at most thirteen of them have been present in our tryptic digestions [11]. The peaks and their respective fragments were run through the MASCOT database. A significant match to *Bacillus thuringiensis*' insecticidal crystal protein was found with a protein score of 146 and an expected value of 4.1×10^{-8} . The very same digestion was spiked into a sample of milk in a 4:1 ratio. No digestion peaks were seen in the mass spectrum. When trypsin was added simultaneously to the spores and the milk, milk proteins were seen; however, no spore peptides were seen. This is attributed to ion suppression. In order to overcome these problems, chromatography would most likely be needed. While this would aid in solving the ion suppression dilemma, it would slow down the process of detection. Relying on tryptic peptides for identification in milk became problematic. Instead of focusing on digestion peaks, the direction shifted to a peak seen from the spores that was visible in the milk.

A peak at 924.3 had been visible in every spectra of tryptic digestions. This peak had been identified as a lipopeptide, called kurstakin, in 2000 and has been further explored since its discovery [7]. It is possible that it is a biomarker for the *Bacillus* genus as it has been located in other species such as *Bacillus cereus* [2]. Hathout identified four $[M+H]^+$ ions m/z 879, 893, 893 and 907 which differed by 14Da which led to the belief that they were homologous lipopeptides [9]. Each lipopeptide differs by the fatty acid chain to which it is attached. The four proposed fatty acid chains are methyl-decanoic, dodecanoic, 10-methylundecanoic and 11-methyl-dodecanoic acids. The amino acid

sequence of the lipopeptide is Thr-Gly-Ala-Ser-His-Gln-Gln [6]. Another isoform of kurstakins has a lactone ring connecting serine and the C terminus of the ending glutamine [bechet].

To show that the source of the 924 peak seen in our digestions was kurstakin, undigested spores were placed in .1M KOH and a solution containing NH_4HCO_3 buffer adjusted to pH 7. A matrix blank was also prepared; no peak at 924 was observed. While no peak at 924 was seen in undigested milk nor digested milk, alpha casein peaks were observed in milk digested with trypsin.

In .1M KOH, hydrolysis of the lactone occurs; the gain of water shifts the peak to 924.27. The sequence of kurstakins was identified as R-CO-Thr-Gly-Ala-Ser-His-Gln-Gln [7]. When the two glutamines are allowed to hydrolyze overnight, the peak shifts to 927, as they are converted to glutamic acids.

After fragmenting the 924.27 peak, we matched the sequence of the lipopeptide to five peaks. The peak at 778, b_6 , corresponds to R-CO-Thr-Gly-Ala-Ser-His-Gln. Each R group is a straight chain fatty acid consisting of twelve carbons ($\text{C}_{12}\text{H}_{25}$). The peak at 650 results from the loss of the two glutamines. The sequence Gly-Ala-Ser-His-Gln-Gln corresponds to the peak at 627 while the peak at 499 originates from the sequence Ser-His-Gln-Gln. The last peak, seen at 412 comes from His-Gln-Gln.

In the buffer solution, a peak at 906.36 was seen. This represents the closed form of lipopeptide before hydrolysis of the lactone. The peak was fragmented and some of the resulting fragments were the following: 760, 632, 609, 481 and 412. After hydrolysis of the lactone, the addition of 18Da shifts the peaks to the ones labeled as b_4 , b_5 , y_1 , y_2 , y_3 in Figure Three, respectively. The only peak that does not shift is the 412 (y_3) peak; this fragmented sequence does not contain the lactone. Since

the peak presented itself without the trypsin, it cannot be a tryptic peptide. This supports the conclusion that the peak comes from kurstakin.

Procedures:

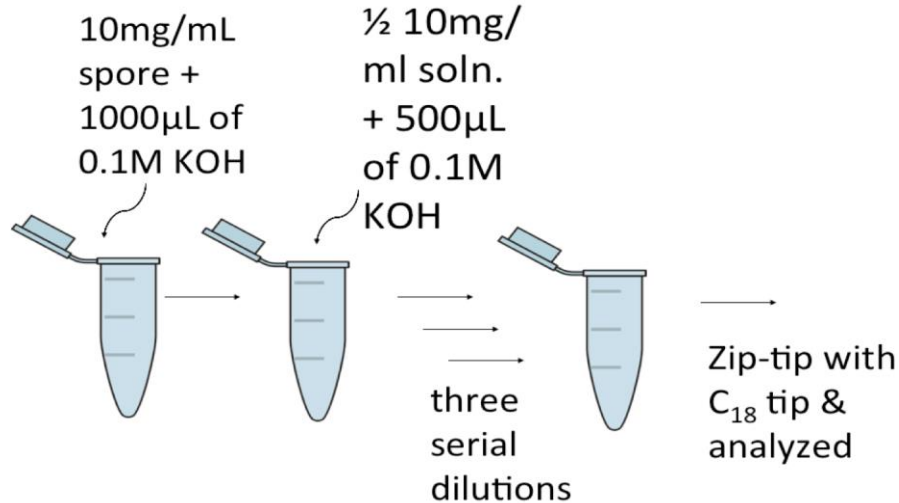


Diagram 2: Flowchart representation of dilutions in KOH

Undigested Spores in Milk. Ten milligrams of *Bacillus thuringiensis* spores were added to 1000µL of milk. The molarity of the sample was adjusted to 100mM with 6M NaOH. The spores were vortexed for one minute and the pH was lowered to below 4 with HCl. While some samples were centrifuged for 3 minutes at 10,000 X g, no significant difference in the results were found when the sample was not centrifuged. The spores were then zip tipped and spotted on a MALDI plate.

Undigested Spores in KOH. Ten milligrams of *Bacillus thuringiensis* spores were added to 1000µL KOH. The molarity was adjusted to 100mM with HCl. The spores were vortexed for one minute and the pH was lowered to below 4 with HCl. While some samples were centrifuged for 3 minutes at 10,000 X g, no significant difference in the results were found when the sample was not centrifuged. The spores were then desalted with a C₁₈ zip tip and spotted on a MALDI plate.

MASCOT Search. Species-specific peptide peaks that matched the tryptic digestion and the resulting fragment peaks were ran through the NCBIInr database using the MASCOT MS/MS ion search (matrixscience.com). The peptide tolerance was set to ± 0.6 Da while the MS/MS tolerance was set to ± 0.6 Da. Modifications that were allowed were carbamido-methyl (C) and oxidation (M). The taxonomy group was restricted to Bacteria (Eubacteria) and no missed cleavages were allowed.

Dilutions in Milk. Ten milligrams of spores were placed in 1000µL of milk and 17µL of 6M NaOH was added to bring the concentration of NaOH to approximately .1M. To create a 5mg/mL solution, 500µL of the 10mg/ml solution was removed, placed in a separate vial and diluted to 1000µL with milk. 6M NaOH was again added to the solution to adjust the concentration back to .1M. Other dilutions were performed in the same manner;

the resulting concentrations were 2.5mg/ml, 1.25mg/ml, 0.625mg/ml and 0.3125mg/ml.

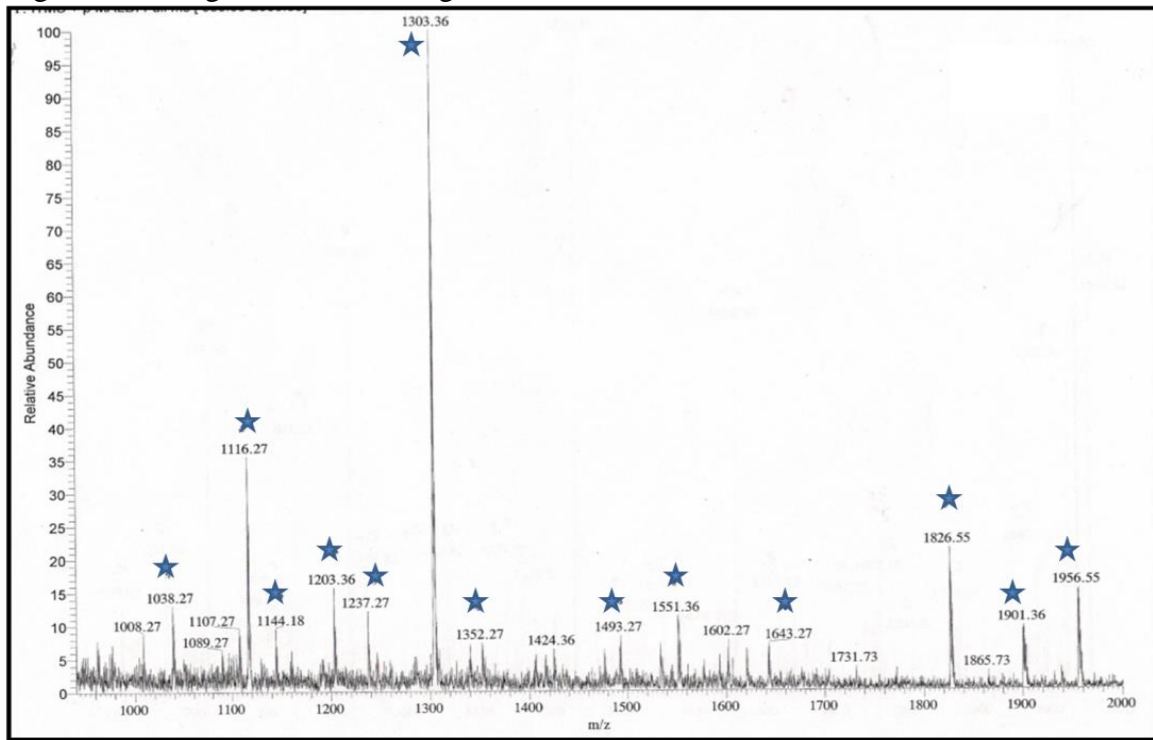


Figure 1: A tryptic digestion of the spores; the starred peaks are species-specific peptides.

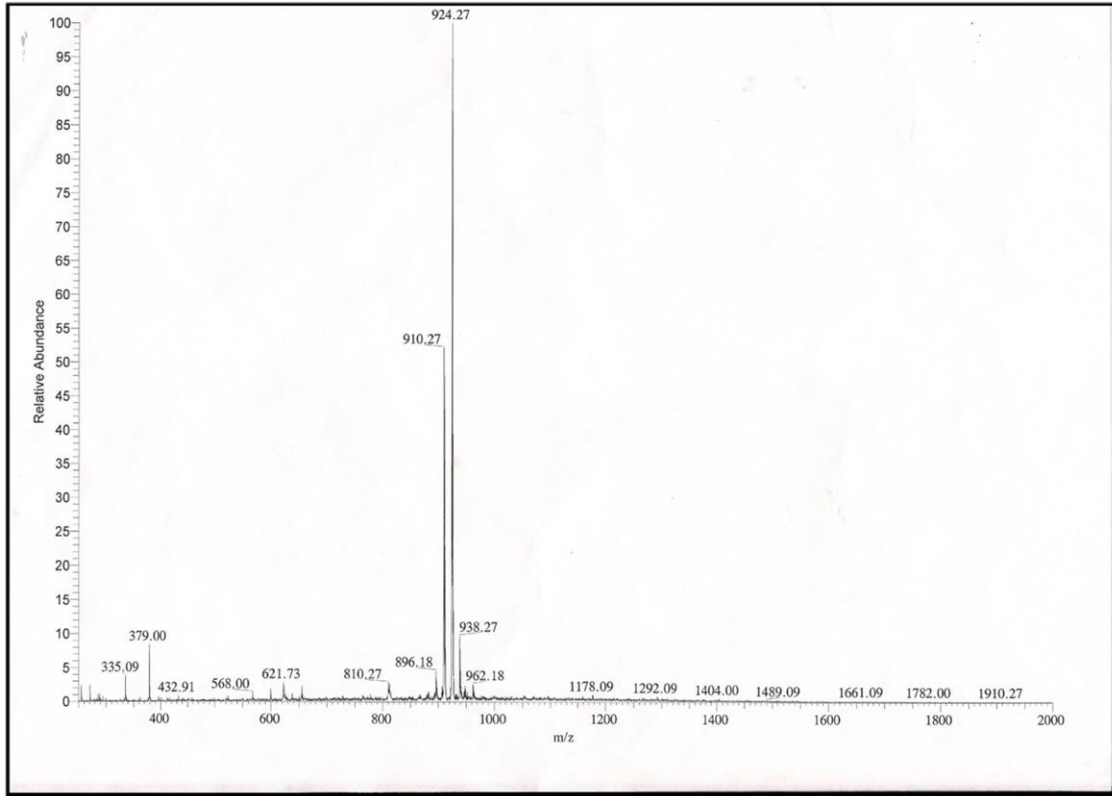


Figure 2: The spectrum of *Bacillus thuringiensis* spores after hydrolysis of the lactone by .1M KOH.

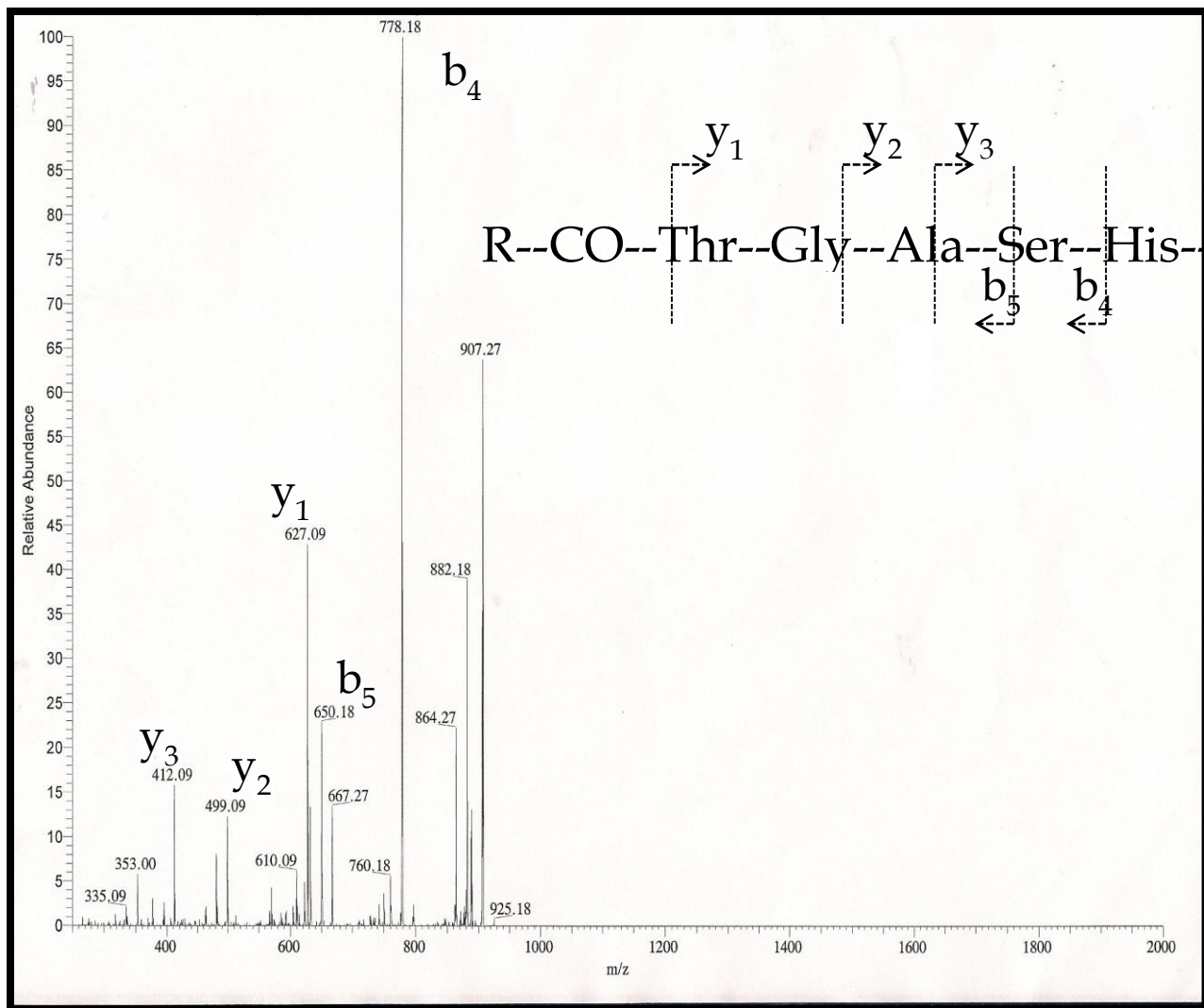


Figure 3: A fragment of the 924.3 peak after hydrolysis of the lactone. The sequence of kurstakins is shown along with several identifiable peaks.

Conclusion and Discussion

While the kurstakin peak was readily identifiable in a 10mg/ml solution of *B. thuringiensis* spores, it was important to find out if the signal was still strong in dilute solutions. We created five solutions by serial dilution of a solution containing 10mg of spores in 1ml of .1M KOH. The resulting concentrations were 5mg/ml, 2.5mg/ml, 1.25mg/ml, 0.625mg/ml and 0.3125mg/ml. In

all solutions, a peak at 924 was seen. When the same dilutions were performed in milk, only the 10mg/ml and 5mg/ml spectra had a peak at 924. This demonstrates that, while kurstakin is more detectable in DI water, identification in dilute samples of milk is also possible. Further research will include efforts to determine if kurstakin is present in other *Bacillus* species.

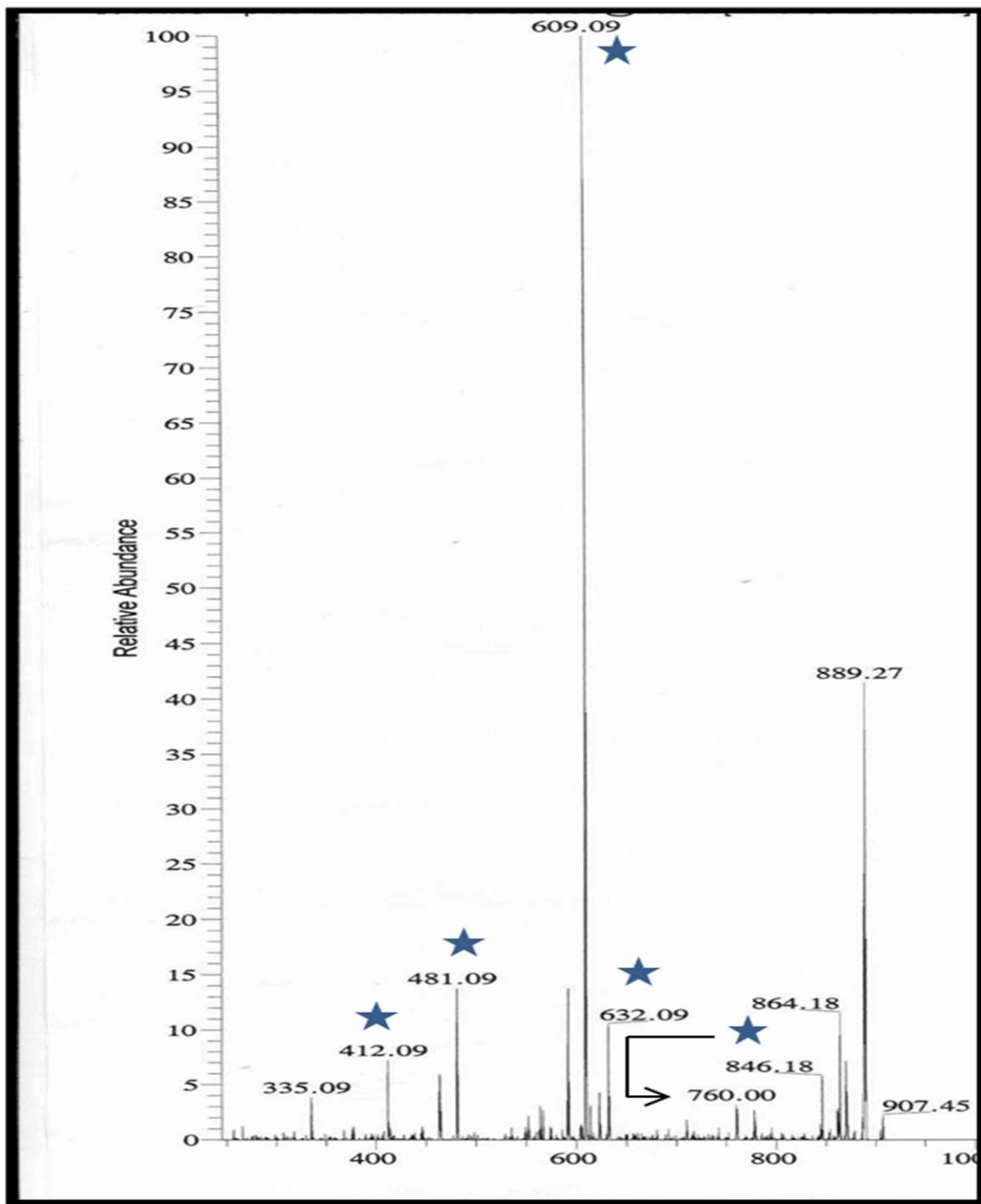


Figure 4: Spores in a NH_4HCO_3 buffer adjusted to pH 7. The starred peaks show the original peaks before hydrolysis of the lactone. Each starred peak, with the exception of the peak at 412, gains 18Da after the addition of water during hydrolysis.

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FK506 Synthesis through Sigma Factor Enhancement: Pathway to Improving Affordable Access to Viable Organ Transplants?

Shiva Niakan

Hearts, kidneys and livers are the most common organs transplanted. If an organ transplant is to be successful, the patient receiving the transplant must take immunosuppressive medication to prevent the immune system from attacking the new organ. There are numerous challenges for patients who require organ transplants. There are limited numbers of organ donors, and successful transplants require finding a donor who matches the recipient. If the donor does not match the recipient, the recipient's body will likely reject the organ, even with immune-suppressant medications. But even with a good tissue match, successful organ transplants often require immune suppressants, and these, too, are in limited supply and costly to produce, which serves to restrict patient access to organ transplants.

Organ donors may be living or dead. Donors who are deceased generally die from the cessation of brain activity. Most tissues and organs must be recovered within 24 hours of heart failure. Once recovered, organs must be transplanted quickly. Tissues, on the other hand, can be preserved for up to five years and kept in storage. In addition, a number of grafts can be retrieved from just one sample of tissue. For these reasons, tissue transplants are much more common than organ transplants. The need for organ transplants is often more urgent than tissue transplants, and for a variety of reasons they can also be more problematic to pull off successfully.

The kidney is the most commonly transplanted organ. With the increased incidence of diabetes and obesity, the need for organ transplants has increased dramatically. Type II diabetes and obesity are prevalent health issues and can lead to problems like

heart disease and kidney failure. Because of this, we can see why efforts to increase our access to viable organ transplants are a growing and critical focus of contemporary medicine.

Because the demand for replacement organs surpasses available supply, scientists are investigating possible ways to grow organs and tissues from stem cells. These stem cells can be embryonic or harvested from the recipient's own body. Use of tissue and cells from the recipient will greatly reduce the potential for problems caused by the patient's immune system. However, stem-cell science is still developing and has not yet established viable options for patients in need of new organs. In the meantime, we rely on organ and tissue donors to provide our available supply. This leaves us with the problem of organ rejection, which occurs when a patient's immune system attacks the transplanted organ. Immune suppressants are utilized to lower the activity of the patient's immune system, increasing the success rate of organ transplants. FK506 is a key component of these immune suppressant drugs, but supplies of this component are limited and can be expensive to produce. The challenge of finding an affordable way to synthesize increased quantities of FK506 also offers the prospect of improving affordable access to organ transplants, at least until breakthroughs in stem cell science can support viable efforts to generate new organs and tissues from a patient's own stem cells. The following research project aims to address this challenge by identifying a cost-effective process for producing FK506 synthesis.

The soil bacterium *Streptomyces tsukubaensis* produces FK506, a polyketide

with immunosuppressant properties. FK506 (Tacrolimus) is used to prevent organ rejection after a transplant surgery. It accomplishes this by lowering the activity of the patient's immune system. Tacrolimus is also used for treatment of atopic dermatitis, an autoimmune disease. This type I polyketide is commercially available at a cost of roughly US \$100,000 per kilogram, and its production is only available through fermentation.

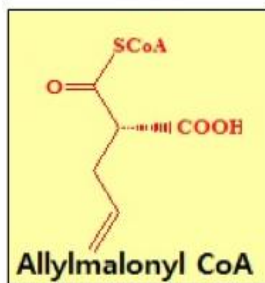
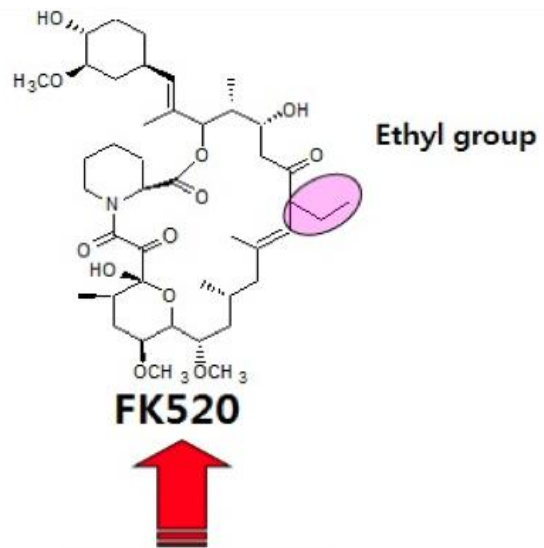
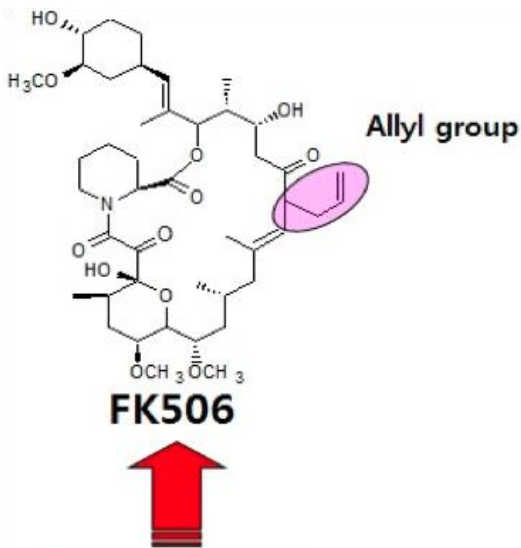
In the early years of transplant activity, the patient's immune system made transplantation impossible except in identical twins. In the 1960's a medication was developed that helped suppress the immune system, but rejection rates were still at a high rate (generally 70-80%). As more medications like Tacrolimus were discovered, rejection rates were gradually lowered, and now run around 10-15%. But because production of FK506 has not kept pace with demand, medications like Tacrolimus have been prohibitively costly. With increases in the synthetic production of FK506, the cost of Tacrolimus could be lowered and the supply increased, making organ transplants a viable option for more people in need.

Strains of *Streptomyces tsukubaensis* known to produce FK506 also produce FK520, which is a structural analog of FK506. The research project I have been involved with aims to increase FK506 production through combined inactivation of ICM and overexpression of sigma factor. Another goal of the project is to confirm that overexpression of sigma factor actually increases FK506 and FK520 through up-regulation of the FK506 biosynthetic gene cluster.

FK506 (Tacrolimus) is an important 23-membered polyketide macrolide with immunosuppressant activity. *Streptomyces* sp.

KCCM 11116P, the FK506 producer, is isolated from 10,000 library strains. The FK506 biosynthetic gene cluster from *Streptomyces* sp. KCCM 11116P (wild type) contains four putative allylmalonyl-CoA biosynthetic genes *fujA*, *fujB*, *fujC*, and *fujD*, which were identified by protein homology search. We also noticed that there exists a putative gene for ECF σ -factor at the beginning of the cluster, which may initiate and enhance the transcription of the cluster with RNA polymerase. Extracytoplasmic function (ECF) sigma factors have different protein sequences compared to most other sigma factors, and they are known to function in cell signaling. As soon as an extracellular signal triggers the receptor, ECF sigma factor activates and commences transcription. We noticed that these genes were actively expressed in *Streptomyces* sp. KCCM 11116P by RT-PCR. When we overexpressed the ECF σ -factor in a replicate plasmid, we noticed that transcription levels of the genes inside the cluster increased substantially. This result suggests that putative ECF σ -factor regulates the transcription of the FK506 gene cluster in *Streptomyces* sp. KCCM 11116P and may play an important role in producing higher amounts of FK506.

FK506 and FK520 are structural analogs of one another, the difference being that the substituent present on Carbon 21: FK506 has an allyl group whereas FK520 has an ethyl group. During FK506 synthesis, ethylmalonyl-CoA and allylmalonyl-CoA compete with each other to produce either of 2 possible products. We hypothesize that by decreasing the ethylmalonyl-CoA quantity, the production of FK506 will decrease, leaving only allylmalonyl-CoA to react and synthesize the desired product.



In the biosynthesis pathway of ethylmalonyl-CoA, a crucial enzyme is present, called ICM. If this enzyme is deactivated, then the synthesis of ethylmalonyl-CoA cannot take place. If the synthesis of ethylmalonyl-CoA is halted, then allylmalonyl-CoA will not have its competitor, resulting in the production of more FK506. Prior research has shown that when ICM deactivation was achieved by in-frame gene deletion, FK520 production decreased by 35% and FK506 production increased by 220%.

Transcription has three crucial parts: initiation, elongation and termination. RNA polymerase complex, with many subunits, is the primary component during transcription. However, the sigma factor is the only component that can initiate transcription.

Extracytoplasmic function (ECF) sigma factors comprise a sequence that differs from most other sigma factors, and they usually

outnumber all other types of sigma factors combined. ECF sigma factors are small regulatory proteins. We found that when these proteins were overexpressed in FK506 and FK520, the result was an increase yield in both polyketides: FK506 synthesis increased by 150% and FK520 synthesis increased by 100%. To achieve optimum FK506 synthesis, we combined ICM inactivation and ECF sigma factor overexpression. This was accomplished in three steps:

Step I: Overexpression of ECF RNA polymerase sigma factor in the ICM inactivated FK506 producer. The overexpression vector of ECF RNA polymerase sigma factor was transferred into the ICM inactivated FK506 producer using the *E. coli*-*Streptomyces* intergeneric conjugation method.

Step II: Quantification of FK506 production in the ECF RNA polymerase

sigma factor overexpressed-ICM inactivated FK506 producer. To quantify FK506 production in the ECF RNA polymerase sigma factor overexpressed-ICM inactivated FK506 producer, this strain was fermented for 5 days, its culture broth will be extracted by methanol, and the extracts will be analyzed by HPLC (High Performance Liquid Chromatography).

Step III: Confirmation of the function of ECF RNA polymerase sigma factor as an upregulator in the FK506 biosynthetic gene cluster. To confirm whether ECF RNA polymerase sigma factor induces the FK506 biosynthetic gene cluster, the gene expression level of PKS (Polyketide Synthase), which is located in the FK506 biosynthetic gene cluster, was checked and compared in wild-type and ECF RNA polymerase sigma factor overexpressed FK506 producer by RT-PCR (Reverse Transcription-PCR).

The wild-type strain was cultured in production medium, and the transcription levels of allylmalonyl-CoA biosynthetic genes were confirmed at 16h, 20h, 24h, 48h, and 72h by RT-PCR. Each primer for RT-PCR was designed to produce 500 bp of DNA band. RNeasy Mini Kit (Qiagen) was used to isolate

total RNA from samples, and Maxima first strand synthesis kit was used to make cDNA. 500 ng of RNA template used for cDNA synthesis, and 1ul of cDNA was used for PCR. PCR was performed for 38 cycles.

ECF σ -factor was cloned into integrative plasmid pSET152 with constitutive *ermE** promoter introduced into *Streptomyces* sp. KCCM 11116P by *E. coli*-*Streptomyces* conjugation. As controls, we also included strains with or without the plasmid pSET152. Each strain was cultured in R2YE medium, and the transcription level of each gene was confirmed at 72 h by RT-PCR. Primers for RT-PCR were designed to produce approximately 500 bp of DNA band. RNeasy Mini Kit (Qiagen) was used to isolate total RNA from samples, and Maxima first strand synthesis kit was used to make cDNA. 500 ng of RNA template was used for cDNA synthesis, and 1ul of cDNA was used for PCR. PCR was performed for 31 cycles.

For this study, the transcription level of biosynthetic genes (*fujA*, *fujB*, *fujC*, and *fujD*) of the FK506 wild-type was analyzed and compared. As a result, the transcription level of biosynthetic genes was enhanced with ECF σ -factor overexpression, relative to wild-type. These results also show that gene cluster productivity is enhanced by the ECF σ -factor

ALL EYES ON US: A Documentary Film Project

About Stockton's Violence and Crime Prevention Strategies

Luis Alcazar

For over a decade, Stockton California has struggled with an inconsistent battle with crime, which included violent crimes such as murders and rapes (fig. 1.1), but in 2012 it had reached a record-breaking level in homicides. Forbes Magazine listed Stockton number eight in their 2012 annual report "The 10 Most Dangerous U.S. Cities," and listed it as the second most dangerous city in California. Although there are many contributing factors to the violent crime spree, it was the local government's lack of financial management that has taken most of the blame.

I propose to make a documentary film that will show the struggle and tribulations of a community that is in desperate need of change, and their fight to regain a sense of security. The film will consist of first-hand accounts from people living in the midst of a city that is overwhelmed by violence. I intend to interview politicians, law enforcement officers, victims, residents, and criminals. This will give a number of community members an opportunity to voice their opinion on issues such as; what contributed to the increase of violence, the impact crime has

Crime rates in Stockton by Year													
Type	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Murders (per 100,000)	32 (13.1)	30 (12.0)	30 (12.1)	36 (14.2)	37 (13.9)	40 (14.6)	41 (14.6)	37 (12.8)	29 (9.8)	24 (8.2)	33 (11.3)	49 (16.8)	58 (19.7)
Rapes (per 100,000)	130 (53.4)	114 (45.5)	144 (58.0)	141 (55.8)	155 (58.4)	108 (39.3)	109 (38.7)	102 (35.2)	105 (35.3)	112 (38.2)	82 (28.1)	107 (36.6)	90 (30.5)

Figure 1.1 (from City-Data.com)

In the summer of 2012, Stockton became the largest city to file bankruptcy in American history. With no money, the city was forced to undergo major budget cuts, including cuts to law enforcement. The decision to cut back on policing, according to many sources, only intensified Stockton's long-standing problems with violence. By the end of 2012, over 1,400 violent crimes were reported; 71 of those were homicides (Anderson 01). In 2013, the state of California intervened and supplied additional support to Stockton's much needed law enforcement efforts.

make a change in their community. I also plan to go in-depth into Stockton's crime prevention plan, which has had a positive impact during their 2013 crime intervention campaign. Although it is too early to acquire and compare 2012 and 2013 statistical data from law enforcement agencies, I have found mapping reports illustrating homicide cases (fig. 1.2 and 1.3). This will show a significant change in homicide rates and provide a better understanding of why there is a need to capture such transformation on film.

had on their lives, and what they are doing to



1.2 A 2012 homicide mapping report (from recordnet.com)



1.3 A 2013 homicide mapping report (from recordnet.com)

Literature Review

Long before Stockton declared bankruptcy, it already had an alarming history of crime that only kept on intensifying year by year. So what exactly happened that escalated the violence in this city? In order to answer this question we have to understand violence; identify cultural factors that could have contributed to the violence; get a basic understanding of gangs; and see what actions (or failures to act) on the city's part may have contributed to the high 2012 crime rates. The focus of the documentary will be centered on violent crimes, so it is important to properly identify violent behavior and how it is developed. Elizabeth Englander, author of *Understanding Violence*, points out that violence and aggressive behaviors are two separate behaviors/actions:

Violence must be distinguished from aggressive behavior. *Violence* is aggressive behavior with the intent to cause harm (physical or psychological). The word intent is

central; physical or psychological harm that occurs by accident, in the absence of intent, is not violence.... The first step in understanding risk of violence must come in understanding where and when violence occurs. We are coming to realize that by far the most common type of violent behavior may occur not in the streets, but in the family. (Englander, 4)



Englander suggests that violent behavior is learned at home and that victims of abuse,

broken homes, and poverty, commit most of the crimes. While Domestic violence is rarely reported and even more rarely punished, it clearly plays an influential role in molding young minds and behavior.

Most experts agree that violent behavior is a learned behavior. The authors of *Cultural Factors in Delinquency* write, “it is now largely agreed that delinquent behavior, like most social behavior, is learned, and that it is learned in the process of social interaction” (Gibbens and Ahrenfeldt 94). But violence is not always learned at home. It is important that parents be involved in their children’s everyday life. But it is not enough to instill proper behavior at home; when children step out of the house they are in danger of learning bad behavior from their peers. Adolescents tend to hang out with kids they can relate to, for instance, those with similar interests or of the same ethnic background. Some teens may join an athletic team, some join an after school program in order to find others they can connect with; unfortunately, many of them find this connection within street gangs.



Gangs have been the largest contributors in violent crimes for the city of Stockton. A study based on a 1994 census showed that Stockton, with a population of 210,943 had 140 different gangs. In comparison with the city of Chicago, which had a population of 2,783,726 only had 125 different gangs (Landre, Miller, and Porter

27,28). The authors of *GANGS: A Handbook for Community Awareness* argue that in order to reduce gang activity, a community-based control is needed:

No single group or organization has the scope to prevent all of these factors, but combined with other organizations, some degree of control can be exercised over gang activity and growth. Many anti-gang programs around the country do succeed in reducing and controlling gang problems. The most successful programs tend to be:

1. *Community-based*, involving up to eight “special interest” subgroups: Service groups, parents, youth, schools, business, government, law enforcement, media.
2. *Long-term*. These programs are not short term or dependent upon discretionary annual funding.
3. *Need-based*. Programs should address and meet the realistic needs of youth in the community and be inclusive of all groups and activities (Landre, et al., 202).

Community members claim that Stockton failed to fully implement any of the programs listed above prior to the 2013 intervention. According to one of my participants, instead of spending money on drug and gang task units, the city spent millions of dollars trying to revamp downtown, which later forced the city to go bankrupt. In *Leisure as a context for youth development and delinquency prevention* the authors highlight the importance of leisure as a context for human development as well as for prevention of risky behavior, including crime and delinquency (France and Homel 271). Stockton, on the other hand, closed many of the leisure programs and recreation centers, which included several parks, a YMCA, and other community programs.

Research Methods

Through documentary filmmaking I will try to explore the crime intervention program or tactics being used by the city of Stockton, in order to share it with other cities. My study will be based on qualitative research. The main method that will be applied to collect the data will be through qualitative research interviews. The interviews will allow the viewer to gather better understanding of human behavior by getting different opinions from participants

that are living within such conditions. Applying this method allows the viewer and the interviewee to connect in a more personal level as it gives the viewer insight into subjective understanding. According to Seidman “The best stories are those which stir people’s minds, hearts, and souls and by so doing give them new insights into themselves, their problems and their human condition” (Seidman, 8).



1.4 Screen shot while editing preliminary research footage

Methods/Procedures/Participants

My study utilizes the documentary film format and will employ several different methods of investigation. Five different approaches will be used in order to collect the essential information I need for the film. The methods in use to collect my data include:

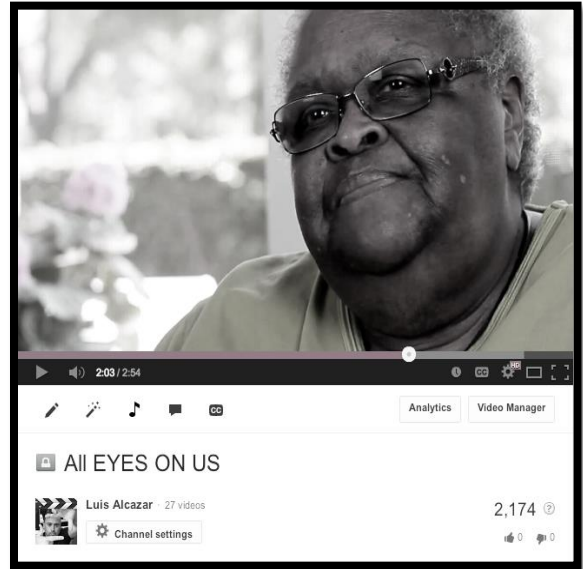
1. Interviews
2. News media recourses
3. Official reports, articles and libraries/librarians
4. Law enforcement interaction
5. Community observation

For the interviews, participants will be selected from groups defined by one of the following criteria:

- (1) Participants must be residents of Stockton or have moved away during 2012 or 2013 due to the violence.
- (2) Participants must be employed by the city of Stockton (government officials, law enforcement, or educators).
- (3) Participants must be from other law enforcement agencies that were brought in to help with crime reduction (CHP officers or Marshals).

The objective is to interview a variety of participants with different backgrounds and perspectives in order to get a broad representation of the problem. Once they are chosen they will be asked a series of fixed, and open-ended questions, which could be modified according to the participant. The questions will be asked as followed:

- a) What is your name (if the participant chooses not to be anonymous) and how long have you lived in Stockton?
- b) In your opinion what was the cause of 2012's crime escalation?
- c) Have you or someone you know



- a) been a victim of crime?
- d) In what way has the violence affected the community?
- e) What do you think needs to be done in order to reduce the crime?
- f) What efforts are being implemented in order to lower crime?
- g) What advice do you want to give the viewers watching this film?

Since most of the filming will take place after 2013, news and media reports will be of significant importance for collecting stories and reports prior to this production. Official reports, statistics and articles will be gathered from the Stockton Police Department, the FBI Unified Crime Report website and academic resources. Police interaction will involve recording tactical meetings and riding with police while on patrol and/or serving warrants. Capturing police activity on film will be crucial in order to understand the crime prevention interventions that are being put into practice. The final method that will be used in the movie is to observe the community, which entails collecting secondary footage. B-roll footage as it is known, will include town hall meetings, church gatherings, city landscapes, and neighborhood scenery that will be

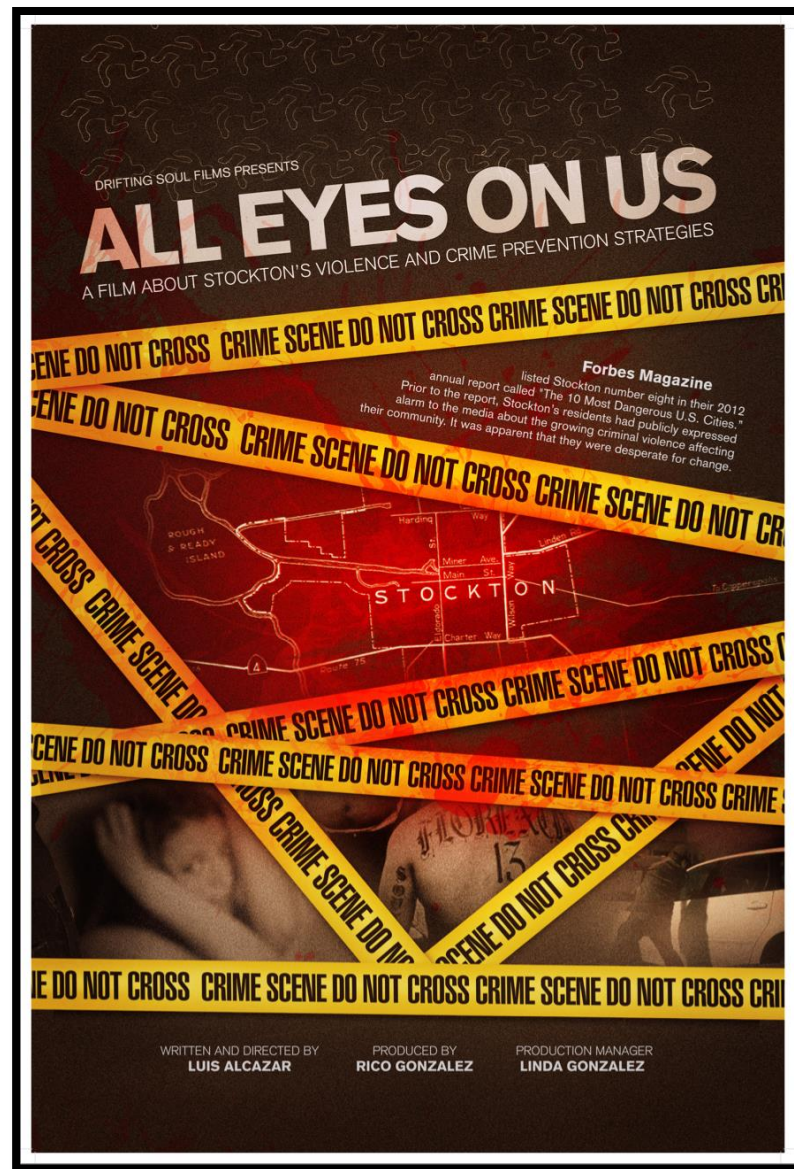
incorporated into the interviews.

Relevance

Modesto also made the Forbes' list "10 Most Miserable Cities in the U.S. to Live in." It is a matter of time before it makes it to the most dangerous list. I feel that my research on Stockton is important because other cities, like Modesto, can take the documentary and apply it as an effort to prevent similar circumstances. According to many experts, crimes follow similar patterns, yet it takes billions of taxpayers' money to come up with solutions that do not work. I believe that a well-documented plan that can be easily accessible and modeled by other cities is needed. For instance, San Jose California, which is listed as one of the safest cities in America, has no written model of their crime prevention strategies in which other cities can possibly follow.

Scope Of Project

The research proposal is to develop a documentary film that can be easily attainable to the masses. The documentary will constitute a different exploration into the relationship between Stockton's crime and its residents. I hope my findings will reinforce the importance of the opinions of its residents and that national policy makers will recognize the role ordinary folks play in aforementioned issues such as violence, crime prevention and law enforcement. In producing this documentary, I will attempt to demonstrate a significant reduction in violent crimes as the city of Stockton, its residents, and the state of California all work together in order to finally change its history of criminal violence. With the help of social media I hope this film reaches millions of viewers and that it will perhaps serve as an educational tool. To get an idea of the possible response this film would receive, I uploaded a three minute rough trailer on Youtube. The results were astonishing, after one week the short video received over 2100 views before switching it to private viewing.



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Bereavement: Exploring The Effects of Losing A Loved One

Ashley Amarillas

Abstract

According to the National Mental Health Association, in 2002 there were about 8 million people in the United States who had an immediate family member die. As a result, thousands of people become widows/widowers and many young people are left grieving. According to previous studies, there are a variety of ways that bereavement can affect individuals. The present correlational study examined seven different outcome variables in bereaved and non-bereaved participants. All participants were presented with a demographic survey and six instruments to measure depression, positive mood, negative mood, alcohol and drug use, recent life events, behavioral issues, and grade point average. It was found that bereaved participants were more likely to have engaged in alcohol and drug use than were non-bereaved participants. In regards to the other 5 outcome variables, no statistically significant differences were found. However, results showed a negative pattern among the bereaved group in the variables of depression, negative mood, and positive mood. Linear regression analyses of data from bereaved individuals revealed a negative relationship between participants' age at the time of loss and the number of behavioral issues. For future studies, researchers could do a longitudinal study with participants to be able to track behaviors as they occur rather than having participants reflect back.

Walking down a hallway of a hospital is the last place you would expect to see a little girl, about five years young, walking alone. She had left the waiting room, where her and two of her brothers were sleeping. It was only a few minutes after sunrise so the sun shined brightly through the window over the horizon. The little girl was in such a trance. The hustle and bustle of the hospital life, doctors and nurses walking fast through the hall way and patients slowly making circles around the halls, had barely seemed to faze her. It was still quiet hours at the hospital so there was not much extra noise around, so the littlest things made such a loud echo in the halls. She ignored them. She finally reached her destination; her brother's hospital room: room number 362. The little girl muttered hello to her oldest brother laying in the bed and her parents who were sitting in his room. They were completely overwhelmed with tears filling in their eyes. The dad questioned the little girl while trying to hide the tears in his eyes. "What are you doing up so early? Did you walk down here by

yourself?" The little girl stood there knowing that her dad was not doing a good job to hide them and she simply said that she could not sleep. "Go back to the waiting room," her father said. Not knowing what was happening, she did not understand why her parents asked her to go back to the waiting room. But she shrugged her shoulders and said okay. Her daddy told her to first give her brother a hug and a kiss and to say good night. The naïve little girl walked up to the side of her oldest brother's bed, stood up on her tippy toes, as high as she could in her pink fuzzy bunny slippers, and gave him a hug, a kiss on the forehead and said "I love you James. Good night." The next time she saw James was the day of his funeral at his viewing. This is Nicholle's story and her vivid remembrance of the night her eldest brother died. Although it is only one person's story, stories similar to this one happen every day around the world.

Introduction

Death is an inevitable part of life. It is unavoidable and inescapable. And sometimes, it happens too soon. The typical circle of life starts with a person being born, having kids, watching them grow up and have kids of their own and then entering old age where one dies of natural causes. If only we lived in that perfect world. Reality check, we do not. There are diseases such as cancer, homicides, auto accidents, work accidents, and even rare accidents that can kill people every day. Life for some people can be cut drastically short. When someone dies, people of all ages, are left to grieve.

Grief, also known as bereavement, is a response to a death of someone. This can include distress of many types including, physical distress, emotional distress, physiological distress and even psychological distress. According to the Centers for Disease Control and Prevention, there were 799.5 deaths per 100,000 people of a population in 2010. In 2002 there were about 8 million people in the United States alone who had an immediate family member die. With numbers like that, that means that millions of people are grieving. Those million people include children, teens and adults of all ages. While there are many people grieving, everyone grieves differently, however there can be many common reactions to someone who has just lost someone. Studies have shown (retrospective and prospective studies) that parentally bereaved children are at a risk for a number of psychological problems including depression, substance abuse, and health risk behaviors (Brent, Melhem, Masten, Porta, & Payne, 2012, p. 779). These are just some of the many effects that bereavement can cause.

One of the major complications that can be associated with grief is depression and anxiety. According to Spuij et al. (2012) there is an increasingly amount of evidence that psychopathology, including depressive and

anxious symptoms, may be different in those who have experienced the death of a loved one. In a study by Spuij et al. (2012), the researchers hypothesized that children who are bereaved would have higher scores on the Children's Depression Inventory and Child PTSD Symptoms Scale (CPSS) and it would correlate to functional impairment due to the loss of a loved one. They examined data from about 332 children and adolescents who were between ages eight to eighteen years old. Of those 332 individuals roughly half of them were bereaved and recruited from health care workers. The remaining individuals were recruited through outpatient mental health clinics. In order to make the participants feel as comfortable as possible, assent forms were given to the children and consent forms were given to the parents and adolescents. Information was then collected from the bereaved about the person who died, including the relationship with the deceased (mother, father, sibling, or other relative) and how the person died (illness, accident, suicide, homicide, unexpected medical cause such as heart attack). All participants completed a twenty-seven item Children's Depression Inventory (CDI) and a twenty-four item Child PTSD Symptom Scale (CPSS). The data was collected and then analyzed. The researchers found evidence that supported their hypothesis. Participants who were identified as bereaved were found to have higher levels of depression and anxiety when compared to the non-bereaved participants.

Another factor that can be effected by bereavement is alcohol and substance use. One study conducted by Hamdan, Melhem, Porta, Song, and Brent (2013) explore the effects parental bereavement has on bereaved youth. The researchers hypothesized that children who had a parent die would engage in more alcohol and drug use. Additionally, they hypothesized that these individuals would also have an earlier onset of drug and alcohol use. This study was a longitudinal population-

based study that was conducted between 2002 and 2012. Researchers examined 235 children whose parents died of suicide, accident, or sudden natural death. These bereaved children were compared to 178 similar children who were not bereaved. The researchers examined data covered a five year period after the death and they found their hypothesis was supported. They found that youth who had lost a parent had more incidences with alcohol and drug use. Furthermore, bereaved children had an earlier onset of alcohol and drug use than those who had not lost a parent.

Additionally, a child who has lost a parent can go through a variety of behavioral issues. According to Draper and Hancock (2011), one in five children who lost a parent is likely to develop a psychiatric disorder. Their study examined delinquent behavior in children who lost a parent. They hypothesized that children who lost a parent would be more vulnerable and would engage in more delinquent behavior. Researchers used secondary data collected from National Child Development, which identified children who were parentally bereaved before the age of sixteen. The Rutter Behavior Scale was used and emphasized children who had exhibited delinquent behavior. Also, the Pearson Chi Square was used. In this study, the researchers found their hypothesis to be true. Children who were parentally bereaved by the age of sixteen were more likely to engage in delinquent and negligent behavior than those who were not (Draper & Hancock, 2011). Bereaved individuals can also have the domino effect, meaning that one problem can lead to the next. For example, when a child engages in delinquent behavior in schools, grades tend to suffer.

Essentially, previous research has been done to look at how bereavement affects children. It is shown that bereavement can have a variety of effects on individuals. Most

research has focused on parental loss while this current study focused on loss in general. The present correlational study examined seven different outcome variables in bereaved and non-bereaved individuals. All participants were presented with a demographic survey and six instruments to measure depression, positive mood, negative mood, alcohol and drug use, recent life events, behavioral issues, and grade point average. It was hypothesized that individuals who were bereaved would be currently more depressed than individuals who were not bereaved. Also, it was hypothesized that individuals who were bereaved would respond differently than non-bereaved individuals in regards to positive mood, negative mood, alcohol and drug use, recent life events, behavioral issues, and grade point average.

Method

Participants. 135 California State University, Stanislaus students recruited via participated in this online study. The age range of participants was 18-61 years ($M=23.31$). The 135 participants were composed of 117 females and 18 males. Participants were not directly given compensation from the researchers for participating in this study, but may have received incentives from individual professors (such as extra credit) in agreeing to participate in the study.

Materials. Participants were required to have access to a computer and internet connectivity to participate in this study. The core of the study consisted of a demographic survey and utilized six instruments to measure the outcome variables. All surveys were given in the same order to all participants.

Design. This study had no true independent variables. It consisted of two quasi-experimental variables which are also known as participant variables. The two participant variables were whether or not the participant had lost someone (bereaved vs. non-bereaved) and if a loss did occur, the age of the participant at the time of the loss. The dependent variables included depressive symptoms, mood, drug and alcohol use, behavioral disturbances and grade point average in college. Each were scored and measured differently.

Procedure. This study was conducted fully online. Once participants were recruited via SONA, they were redirected to Qualtrics (an online questionnaire software). At the beginning of the study, participants were given a consent form. Once they clicked “agreed,” they were advised to print the consent form for their records. After consent was given, each participant had to verify they were a CSU Stanislaus student. Once participants clicked “Yes, I am a CSU Stanislaus student,” they were taken to a demographic questionnaire. This demographic questionnaire asked the participant about age, gender, major, grade in school and if someone in the family died. If someone in the family had died, participants were asked seven additional questions. They were first asked how many people had died in their family; and if there was more than one loss, participants were asked to answer the remaining questions based on the most impactful lost. They were then asked who died, how the person died, how close they were to that person on a scale of 1-5, how often the participant had had contact with the family member before he or she died, how old the participant was at the time of the loss, and who the primary caretaker was at the time the loss occurred.

At this point, the survey instructions were given to each participant. Participants were told that each survey would have its own instructions, and they were told to follow them

carefully. The first survey given was the 21-item Beck’s Depression Inventory. Participants were told to answer the questions to the best of their ability in regards to the past year. Next, participants were given the 20-item Positive and Negative Affect Schedule (PANAS), and the participants were instructed to reflect back on the past six months. After that, participants were given the 50-item Inventory of Drug Use Consequence where all participants were instructed to answer over the period of their whole life. Next, participants were given a 41 item Recent Life Event Survey. Participants who had lost someone were asked to answer the questions in regards to six months after the death, and if a participant had not lost someone, they were asked to answer the questions in regards to high school. Following, participants were then given the 41-item Behavioral Inventory. Participants who had lost someone were asked to look back on a year after the death and if no death occurred, participants were asked to look back on high school. Lastly, the participants were then given the grade point average survey, which asked for their major, grade in school, last semester GPA and cumulative GPA.

No time limit was placed on completing the surveys; participants were able to take as long as they like. Once participants finished the questionnaires, they were directed to a debriefing form and asked to print the form for their records.

Results

This study examined effects of bereavement on individuals. I predicted that individuals who were bereaved would currently be more depressed than individuals who are not bereaved. I predicted that individuals who are bereaved would respond differently than non-bereaved individuals in the areas of positive mood, negative mood, drug and alcohol use, recent life events, and behavioral issues.

An independent T-test was conducted on each outcome variable. This allowed us to compare the means of the bereaved group versus the non-bereaved group to determine if there was statistical significance. None of the variables showed statistical significance except for the drug- and alcohol-use variable, $t(133)=1.96$, $p=.052$, two-tailed. A comparative means was also conducted to determine what the mean was for each dependent variable in relation with each participant variable. The means and standard deviations of each dependent variable were calculated and are shown in Figure 1. The drug- and alcohol-use means are shown in Figure 2.

Linear regression analyses were conducted on the bereaved group and all the dependent variables. This was done to determine if there was a relationship between the age of the participant at the time of the loss and any of the dependent variables. This analysis revealed a negative relationship between the participant's age at the time of loss and the number of behavioral issues. In particular, it was determined that the younger the participant at the time of the loss, the higher the ensuing number of behavioral issues. No other relationships were discovered between age at loss and the other dependent variables.

Discussion

Again, it was hypothesized that individuals who have lost someone will currently be more depressed than those who have not lost someone. Additionally, it was hypothesized that individuals who have lost someone would respond differently than those who have not lost someone in positive mood, negative mood, alcohol and drug use, recent life events, behavioral disturbances, and grade point average. Several of my hypotheses were supported. I found that individuals who were bereaved engaged in more drug and alcohol use than those who were not bereaved. While I found no additional statistical significance in

the means of depression, positive mood and negative mood, I did discern some significant patterns. The depression mean was higher in the bereaved group, the "positive mood" mean was lower in the bereaved group, and the "negative mood" mean was higher in the bereaved group. While none of these patterns were statistically significant, they do seem significant in so far as they exhibit some of the effects on bereavement on individuals.

There are some limitations to my study. Since all that was needed for this study was a computer (or mobile device) and access to internet, it could be done anywhere. This may cause the environment for the survey to be inappropriate. There could be distractors present, peers present who may influence answers, and participants could not designate an appropriate amount of time to the study. Also, this current study requires participants to look back on the loss of a loved one. Since they are reflecting back on a time, memory issues can arise. For future studies, I would search for ways to reduce these limitations. I would recommend that researchers conduct this study in-person rather than online to ensure the environment is appropriate. I would also recommend that researchers conduct a longitudinal study. This would be beneficial in allowing researchers to observe these behaviors as they happen, over time.

	Depression	Positive Mood	Negative Mood	Drug Use	Recent Life Events	Behavioral Inventory	Last GPA	Cumulative GPA
Bereaved (Mean, SD)	11.70, 10.3	34.83, 8.76	24.80, 9.01	6.64, 8.61	71.68, 22.11	53.13, 43.49	3.27, .61	3.46, 2.76
Non-Bereaved (Mean, SD)	9.03, 7.25	36.24, 8.52	23.17, 7.50	3.41, 4.04	68.93, 20.06	53.90, 49.26	3.22, .59	2.96, .72

Figure 1. The means and standard deviation of each dependent variable in correlation with each participant variable.

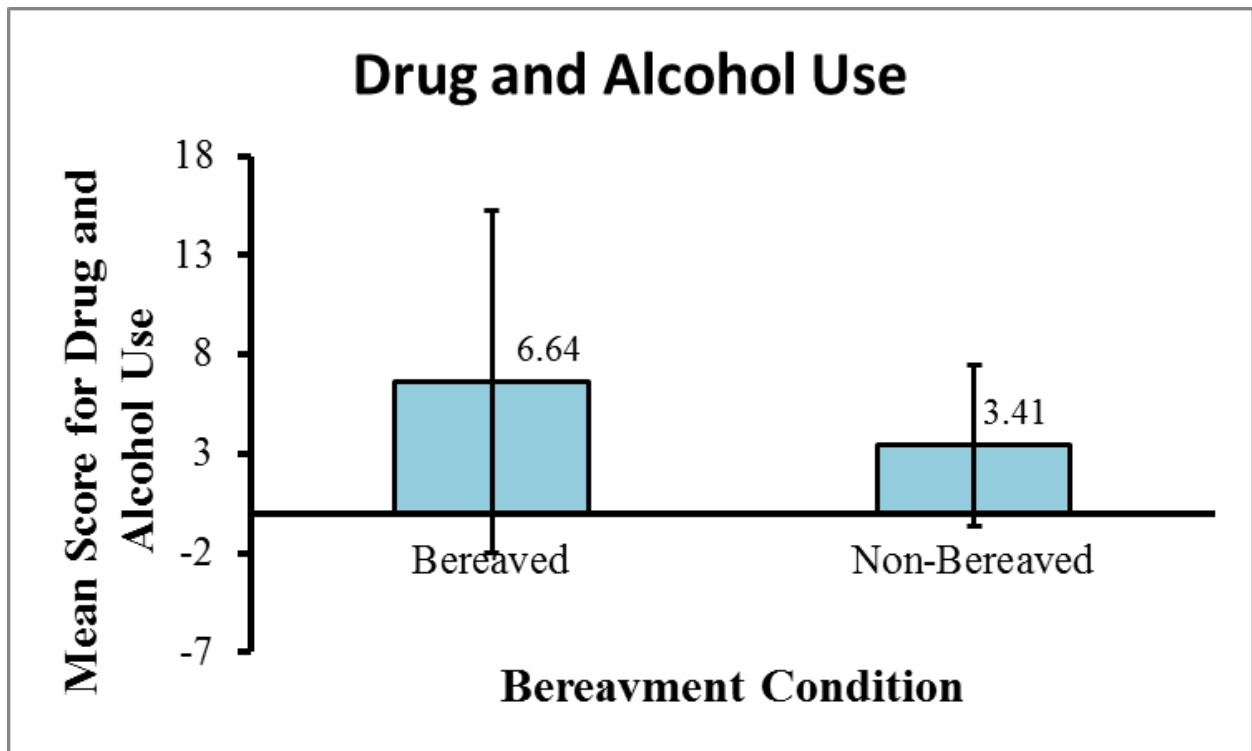


Figure 2. The means scores for the drug and alcohol use variable for each group. Error bars represent the standard deviation.

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Storm Water Pollution at CSU Stanislaus

Amber Deming

The Issue: Storm Water Pollution

Storm drains are an ever-present part of the urban city structure. The drainage of water from a city is crucial to its functioning. Without proper drainage, areas are subject to flooding, and the collection of water. Stagnant water pools are not only dangerous to motor vehicles that cannot drive through deep puddles of water, but also pose a health threat. Bacteria and other toxins can gather in pools of water and become breeding sites for hazardous germs.

A storm drain's role is to be an entry point for water runoff to enter storm drain tunnels that flow to bodies of water. It is important to understand that water that flows into storm drains does not go to a water treatment plant. All of the pollutants that water picks up as it flows down the street into the drain is carried with it to its destination. Sediment is the number one pollutant in the country¹. Sediment clouds up water and can suffocate aquatic life. It also has the potential to deteriorate fish and plant habitats by settling out of water. In this case the most damaging pollutant is not something that would necessarily be considered a toxin or chemical. Fertilizer is another major pollutant of storm water. Nitrates and phosphates from fertilizers promote algae growth, which can crowd out aquatic life and remove oxygen from water. Fish and other aquatic animals need oxygen to live.

In terms of litter, almost a third of all litter found in storm drains are cigarette butts. Cigarette butts are often thrown on the ground

because that is the easiest way to dispose of them. Oftentimes, appropriate receptacles are simply not present for consumers to utilize. Cigarette butts are damaging when they find their way into an environment and become harmful to inhabitants. Nitrates and other damaging chemicals found in cigarette butts can be absorbed by water. Cigarette filters are made from a type of plastic that does not easily biodegrade. While paper litter soon breaks down, plastic litter remains.

The "Pacific Trash Vortex" is an extreme example of the effects of plastic litter polluting the water. This "vortex" is an accumulation of debris held together by ocean currents. Debris accumulation in this vortex is estimated to be twice the size of the continental United States.² When divers working with the international environmental organization Greenpeace explored the site of the trash vortex, they found bodies of waterfowl, fish and other mammals floating in with the trash. These animals got caught up in the debris of the vortex, most likely when exploring the trash for food. Extreme examples like this should serve as cautionary illustrations of what can happen when water pollution is not properly addressed.

Why Focus on CSU Stanislaus?

Every day there seems to be more talk about the growing issue of pollution in the media, in government, and in the homes of citizens. In almost every industry, greater focus is placed on developing sustainable practices in an attempt to combat pollution. One area with a strong focus on sustainability

¹ Clean Water Education Partnership." - *Why Is Stormwater a Problem?* Clean Water Education Partnership, n.d. Web. 20 Dec. 2013.

² Marks, Kathy, and Daniel Howden. "The World's Rubbish Dump: A Tip That Stretches from Hawaii to Japan." *Environment News Futures* (2012): n. pag. 5 Feb. 2008. Web. 20 Dec. 2013

issues is higher education. Universities often change their practices and implement new programs in order to achieve recognition as a “green” campus. For a 4th consecutive year, California State University (CSU) Stanislaus has been recognized by *The Princeton Review* as one of the nation’s more environmentally responsible campuses.³ In addition to being a focus of the University’s administration, the importance of sustainability is an important priority for the students of the CSU system. The California State Student Association (CSSA) is the official representative for over 400,000 CSU students. Sustainability issues have become among the CSSA’s most pressing priorities. Policies and resolutions have been implemented to establish requirements and recommendations calling on CSU campuses throughout the state to improve their sustainable practices.

The Central Valley provides a very unique environment amongst the various locations of the 23 CSU campuses. The regions served by CSU Stanislaus, Fresno and Bakersfield have agricultural, environmental, and water-related issues unique to the Central Valley. In November 2013, the official student groups representing these three CSUs collaborated at the Central Valley Leadership Conference. At this conference, the goal of a continued and renewed focus on sustainability was collaboratively set for the Central Valley campuses. Clearly there is recognition among campus student leaders of the irreparable harm caused by pollution.

The environmental concern for sustainability on so many levels is one of the main reasons CSU Stanislaus is a great location for this research project. The University also reflects many of the characteristics of city environments overall.

³ Leonard, James. "CSU Stanislaus a 'Green College' for Fourth Consecutive Year University's Sustainability Efforts Recognized Again by the Princeton Review." *Csustan.edu*. California State

The University experiences a large amount of people travelling through it every day. The foot traffic from students, faculty, employees and visitors simulate the concentrated populations of cities larger than Turlock. The University’s structure is not overly unique to the point that the results of this study could not be applied elsewhere. The combination of many impervious surfaces with grass areas provides for a compromise of environment types.

On the civic level, the city of Turlock addresses issues of storm water pollution on their website. The page outlining preventative suggestions highlights its “*Only Rain Down the Drain*” campaign and identifies the potential pollutants to manage carefully, including motor oil, yard waste, fertilizers and pesticides, and pet waste. They also explain how the water that goes into storm drains does not go through a water treatment plant. It travels directly into the San Joaquin River. Turlock will soon be looking into addressing its storm water drainage plan. With a population that has grown steadily from approximately 13,000 to 70,000 currently in just 40 years,⁴ Turlock continues to embrace its potential for growth. It is important to note that once Turlock reaches a population of 100,000 residents, it will be subject to stricter storm water regulations. Turlock already has issues with flooding during heavy rains. The proper drainage of rainwater will need to be addressed in the near future for the environmental safety of its residents and surrounding region.

Methods

To properly evaluate the storm water pollution on campus, the types and sources of pollution must first be identified. To do this, a visual sweep of campus was conducted to predict potential pollutants. The identified

University, Stanislaus, 18 Apr. 2013. Web. 20 Dec. 2013.

⁴ City of Turlock website:
<http://www.turlock.ca.us/aboutturlock/>

sources of potential pollution include: cigarette butts, fertilizer runoff, litter, bird waste, yard waste, construction debris and gravel and dirt. The cigarette butts and litter are a result of careless and improper disposal. Yard and bird waste are natural debris that, when improperly removed, can flow into drains. The yard waste could also be from lawn mowing and other landscaping (or “softscape”) that has been improperly disposed of. The same issue arises in the course of construction activities. Un-utilized or under-utilized Best Management Practices (BMPs) in the construction or occupancy phases can potentially release debris into storm drains. Fertilizer runoff would be a result of over-fertilizing, over-watering or faulty sprinkler systems that direct water into storm drainage systems. One major issue is that the sprinklers are set to run during off-hours when people are not generally present to notice problems.

To further investigate the issue, an understanding of the master plan of the campus is needed. A discussion with the facilities personnel will reveal the set-up for landscaping and water drainage on campus. This will help determine which pollutants are making their way into gutters, down storm drains, and eventually into the San Joaquin River. A campus plan that adequately targets this issue should have some version of an environmental program or Storm Water Pollution Prevent Plan (SWPPP) in place and detailed maps highlighting the key areas of concern. The plan should also list identified risks of potential pollutions on the campus. Along with these plans, educational resources should be directed to the people who have relevant duties or spheres of responsibility that can impact the university’s environmental practices. Depending on the infrastructure, “end of pipe” or “outfall” testing might reveal the “total output” of pollutants from the

campus property and could also offer a better characterization of the elements comprising campus storm water discharge.

Impact

The impact analysis of this study is projected to show that there are a number of suspended solids in the water that runs to storm drains on campus. Per confirmation from the University facilities department, water that flows to campus storm drains is expected to flow to the same location as Turlock city drains, which flow to the San Joaquin River. The San Joaquin River is home to many different types of wildlife, including geese, riparian woodlands, brush rabbits, eagles, hawks, elk, waterfowl, songbirds, deer and numerous other species. In addition to the risk of damage to the habitat and drinking water for these creatures, there is an agricultural aspect to the San Joaquin River. Water from the river is diverted for agricultural purposes to thousands of farmers throughout the Central Valley. Contaminants in the water will travel with the water into the irrigation systems of farmers across the valley, potentially impacting the quality of the food they produce for us.

Preventing Further Pollution

The University can prevent pollution from human sources through educational outreach. By educating those who utilize the CSU Stanislaus campus, faculty, employees, students and local visitors can work to reduce, the contamination from litter. The University can also reevaluate management practices for improvement to encourage more effective prevention of pollutants. The EPA has established *Six Minimum Control Measures*⁵ that the University can appropriate to address storm water pollution on campus. These six measures include:

1. Public education and outreach

⁵ Stormwater Phase II Final Rule Fact Sheet Series." EPA -. N.p., n.d. Web. 20 Dec. 2013. <<http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>>.

2. Public participation/involvement
3. Detection and elimination of illicit discharge
4. Control measures to manage construction site runoff
5. Control measures to manage post-construction runoff
6. Pollution prevention and good housekeeping practices

By utilizing these six important control measures, the University can enhance its current storm water management plan and improve the quality of water that flows from the campus into the surrounding environment.



Conclusion

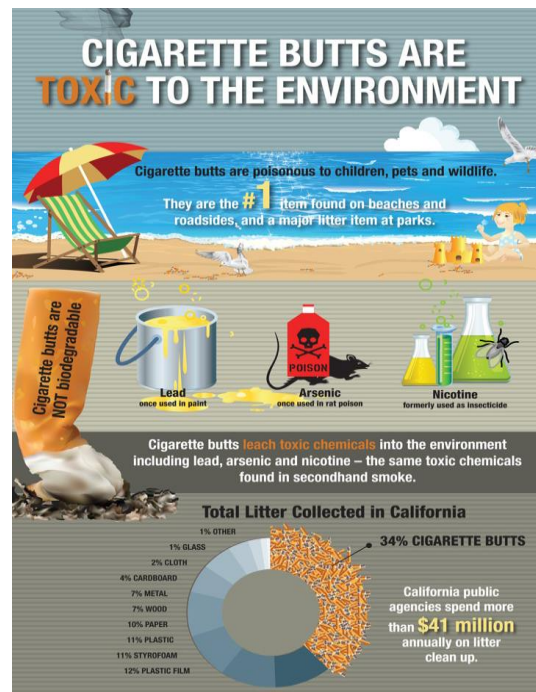
I anticipate deficiencies will be discovered in campus sprinkler systems. Faulty sprinkler systems misdirect water onto streets, often at night when few people are around to notice and report these conditions. Correcting this problem should become a pressing priority for the campus as a critical first step to address runoff issues. Addressing avoidable pollution that mixes with storm water runoff should be the next priority.

While there is often room for steady improvement when it comes to protecting and preserving our environment, in this instance the room for improvement calls for immediate attention. CSU Stanislaus has a special role to

play in addressing issues within its power to solve, in ways that help to educate the region.

The point of this study is not to leave the impression that CSU Stanislaus is negligent in addressing storm water runoff, but to identify significant areas for possible improvement. I predict a more thorough study conducted along the lines outlined here would show that storm water prevention practices at CSU Stanislaus are in line with current regulations, yet still manifest considerable room for improvement.

CSU Stanislaus is clearly an innovative university. But while it remains ahead of the curve in regard to implementing many sustainability practices, the campus continues to fall short of viable standards of sustainable practice in the areas of water runoff and avoidable pollution. By acting more aggressively to meet its own achievable goals, the CSU Stanislaus can provide key leadership for the Central Valley in showing how to address subtle yet far-reaching issues of water pollution impacting the surrounding region and beyond.



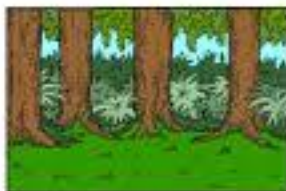


ALL STORMDRAINS LEAD DIRECTLY TO OUR PONDS, RIVERS & BAYS



HOW MUCH STORMWATER RUNOFF DOES ONE INCH OF RAIN PRODUCE?

When it rains, about 5% of the rain water runs off wooded areas and about 95% of the rain water runs off a parking lot. During a one inch rainstorm . . .



1,361 gallons of water runs off a one-acre wooded area



25,800 gallons of water runs off a one-acre parking lot



Margins II