AGATHAI

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Editors' Introduction

This school year's first issue of the *Agathai Quarterly Journal* features selected works by past and present Mortar Board at UCLA members. The works in this issue examine themes of history, biochemistry, sociology, linguistics, and psychology. In the spirit of scholarship, we encourage you to read this publication to learn about a variety of topics, to provoke new thoughts, and to challenge existing ideas.

In the article, "Garum: The Material Culture of Rotted Fish-Paste," author Ilona Gerbakher examines how knowledge a fermented fish dish can give insight into understanding a culture.

In the article, "Discovering the Characters and Functions of Turnip Peroxidase," author Grace Ji examines the properties of turnip peroxidase under a wide range of pH and temperatures and in the presence of a competitive inhibitor.

In the article, "Piecing Together the Modern Family," author Anderson Nguyen discusses the transition from the traditional nuclear family to the more contemporary modern family.

In the article, "The Effect of the Rwandan Genocide on Governing Identities and Norms," author Melanie Sie uses the lens of globalization to explore the tensions between transnational, national, and group identities in the Rwandan Genocide..

In the article, "Gendered Emoticon Used in Public and Private Online Conversation: =(, :o), >:(," author Avani Vachhani investigates the gendered use of emoticons in both private and public conversations.

In the article, "Major Depression over the Life Cycle," author Golmah Zarinkhou explores the factors related to major depression in order to increase understanding and, in turn, improve treatment.

The cover features a photograph taken by Erika Drazen.

Garum: The Material Culture of Rotted Fish-Paste

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Introduction: Food as an Item of Material Culture

Patterns of food production and consumption are a wonderful vehicle for understanding the material culture of a region and an era. Tracing the production, consumption and evolution of one food product in particular-*garum*-allows the reader the examine the way that food can be a symbol of social status, can effect economic growth, and can be a symbol of political ascent and decline. *Garum* in its simplest form is a fermented fish product, where the scraps of whole fish (such as innards, gills and tails) are salted, placed in jars, and kept out in the sunlight for days or sometimes months.[1] *Garum* begins to be used in the cuisine of Athens in the fourth and fifth centuries BCE, and at the dawn of the Roman Empire it is the single most important condiment of the classical world.[2] As the Roman empire spread into North Africa, Spain, the Middle East and to the Black Sea, so too did the use of *garum* as a major condiment. However, the fall of Rome heralds a rejection of this type of condiment, and in the early Islamic period this fermented fish sauce is a relatively minor aspect of the many new regional food cultures that arose in that time period.[3] This paper will examine *garum* from the period of antiquity until late Antiquity in three different ways. First, the paper will examine *garum* in the Roman empire-how it was used, how it was produced and who produced it. Second, *garum* will be examined as an aspect of the material culture of the period spanning the second through ninth centuries AD. What role did it play in the Roman and Byzantine economy? How did the use of *garum* indicate social status? Can the use of *garum* be seen as an indicator of the political ascent and decline of the Roman Empire? In the conclusion, the mysterious 'disappearance' of *garum* during the Early Islamic period will be analyzed, and an explanation for this seeming disappearance will be attempted.

Part 1: *Garum* and the Roman Empire

The Romans began to use *garum* as a condiment in the third century BCE, probably around the end of the Punic wars in 241.[4] For them it served several major purposes-it was used as their primary condiment, in much the same way that the West uses salt,[5] it was used as a medicine for many maladies of both the physical and emotional variety,[6] and it was also made into a kind of savory alcoholic beverage. Perhaps the most important use of *garum* is the use of *garum* as a condiment. In order to examine this use, it is first important to understand that *garum* is a generic term for four different types or classes of fermented fish sauce in the Roman empire; these four different classes are *garum, liquamen, allec,* and *muria.*[7]

According to Edmonson, a 20th century historian of food during the period of late antiquity,

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[1] Kurlansky, Mark. *Salt: a World History.* New York: Walker and, 2002. Print.

[2] *Ibid., page 70.*

[3] *Ibid., page 78.*

[4] *Ibid., page 68.*

[5] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print.

[6] Curtis, Robert I. *garum and Salsamenta: Production and Commerce in Materia Medica.* Leiden: E.J. Brill, 1991. Print.

[7] Edmondson, J. C. *Two Industries in Roman Lusitania: Mining and Garum Production.* Oxford, England: B.A.R., 1987. Print.

"*Garum* derives from *garos,* the fish originally used by the Greeks to make a sauce of the same name. The sauce was made by combining the intestines, tails, and sundry parts of whole fish, packing them in containers full of salt, and leaving the containers in the sun for up to nine months, in order to ferment the fish. The sediment that remained behind after the fermented liquid had been drawn off

was *allec*, which was used as a fish past or savory. The brine itself-the water drawn out of the fish by salt...was called *muria....Liquamen,* so called because the

small fish liquefy in the pickling brine... tended to be a generic term for all such fish sauces, and seemingly was considered a fish sauce in its own right."[8]

The precise production process of these four types of sauce, and recipe for the sauce, will be discussed in the next part of this paper. However, here the focus is on culinary usage, and a rather good discussion of the ubiquity of this sauce comes from the history of salt written by Mark Kurlansky. He writes "the Romans used *garum* in much the same way that the Chinese use soy sauce. Rather than sprinkling salt on a dish, a few drops of *garum* would be added to meat, fish vegetables, or even fruit.[9]"

The use of *garum* in Roman cuisine was widespread among all levels of Roman society, from the highest to the lowest.[10] Edmondson notes that "the oldest cookbook still in existence, *De Re Coquinaria*-which is credited to Apicius-gives far more recipes with

garum than with salt. *Garum* was much more expensive than salt but Apicius preferred it, as did most Romans who could afford it...[11]" For a modern eater, the usage of rotten fish paste as a major adornment to food is, perhaps, difficult to understand. However, Robert Curtis, a classicist and one of the most prolific living writers about *garum*, gives an explanation for the culinary delights of the rot. He explains, "although for hundreds of years it was commonly thought that humans can experience only four tastes-salty, sweet, bitter and sour, in the last decades Japanese scientists have discovered a fifth taste: Umami, or 'savoriness.'[12]" It is this fifth taste, Umami, that *garum* provided for its avid consumers, because the process of fish-juice fermentation produced monosodium glutamate, (commonly known as MSG) which is the most common source of the Umami

taste[13].

Garum in all of its myriad forms was not only used as a condiment in the ancient world-it was also important for its medical uses, so much so that the Galen, perhaps the most influential physician of the Roman era, dedicated a chapter to it in his medical textbook <u>*Materia Medica*</u>.[14] Physicians saw in *garum* many benefits, and it was especially used for the treatment of "digestive disorders, sores, sciatica, tuberculosis and migraine headaches.[15]" According to Galen's medical treatise, *garum* and its cheaper cousin *allec* could be used to "cure scabies in sheep and is also a good antidote for the bite of a dog or sea dragon. *Garum* heals burns...ulcers, and the bites of crocodiles...it can be prescribed as a laxative...and used to purge afflicted mares of pleghm or spavin."[16] Roman veterinary authors such as Pelagonius and Vegetius, writing in the fourth century AD and copying remedies from earlier sources, also recommended treatments using *garum* and *liquamen*.[17] *Garum* was also used as a kind of cocktail-mixer with wine: one recipe from the *De Re Coquinaria* of Apicius

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[8] *Ibid.*, page xxii
[9] Kurlansky, Mark. *Salt: a World History*. New York: Walker and, 2002. Print. Page 73.
[10] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print.
[11] Edmondson, J. C. *Two Industries in Roman Lusitania: Mining and Garum Production*. Oxford, England: B.A.R., 1987. Print. Page 80.
[12] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print.
[13] *Ibid.*, page 235
[14] Ascani, Karen, and Jens Erik. Skydsgaard. *Ancient History Matters: Studies Presented to Jens Erik Skydsgaard on His Seventieth Birthday*. Rome: "L'ERMA" Di Bretschneider, 2002. Print.
[15] Kurlansky, Mark. *Salt: a World History*. New York: Walker and, 2002. Print. Page 71.
[16] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print. Page 237.
[17] *Ibid.*

suggest that *garum* be mixed with "wine, *liquamen*, pepper and various other spices and herbs...and then honey should be added." This sweet, salty, pungent mixture was sometimes drunk at the table, and the remains were used as a dressing which we might recognize as vinegar, and which the Romans called "*oenogarum*[18]."

The ways in which *garum* was produced in the Roman world, and the kinds of people who produced this culinary marvel gives insight into the nature and extent of the

food economy of the Roman period and the period of late antiquity. First of all, it should be noted that the production of *garum* was so odiferous as to be outlawed in urban areas- no private production of this sauce was possible in the heart of major cities of the Roman empire.[19] The reason for this odor is made very clear when a recipe for the production of *garum* is provided:

> "The so-called *liquamen* is made in this manner: the intestines of fish are thrown into a vessel and salted. Small fish....are all salted together and shaken frequently and fermented in the sun. After it has been reduced in the heat, *garum* is obtained from it in this way: a large, strong basket is placed into the vessel of the aforementioned fish, and the *garum* streams into the basket. In this way, the so- called *liquamen* is strained through the basket when it is taken up. The remaining refuse is *allec*...[20]

The reader can only imagine the subsequent fragrance of thousands of urns of small, salted fish, rotting away merrily in the Roman sunshine! The law (quite sensibly) forbidding the production of *garum* in urban areas pushed *garum* production to the margins of the Roman empire; in fact, any where there was a major salt-work, a network of *garum* producers would spring up. For example, Sardinia, Gades in Spain, Byzantium (present-day Istanbul), Sicily, sites on the Dnieper River in Ukraine, Tyre, Gaul, and Accra in modern-day Israel are all places where *garum* factories are found side-by side with the major saltworks of the Roman empire.[21] Many of these locations lie on the periphery of the empire, and the empire of *garum* itself stretched from the far shores of Britain and to the upper reaches of Ukraine, to the south of Egypt and into the northern hinterlands populated by Germanic tribes.[22] According to Kurlansky, *garum* was the primary condiment of a geographic area that extended across some 1,698,849 square miles.

To be a producer of *garum* was a way for the bottom of Roman society to achieve some kind of upward mobility-freedmen, slaves and women benefitted particularly from their participation in the process of producing and selling *garum*. There are three monographs on the subject that are particularly helpful when looking at *garum* production as a source of power for the powerless: The work of Evan Haley on L. Iunius Puteolanus, a freedman, Piotr Berdowski's monograph on Roman Businesswomen in Pompeii, and Vicki Leon's discussion of the Sestiis, a family of slaves who ascended to the very height of the Naples elite. Before beginning this discussion, it is helpful to note that the production of *garum* was relegated to the very bottom of acceptable Roman occupations, or what Cicero called "*mercatura sordida.*" It was an occupation almost as lowly as the occupation of street-sweeping or handling dead bodies.[23] The association with stench, rot and death tainted the professions of *garum* production and distribution. However, never has the phrase "money never stinks" been more appropriate than when considering the case of wealthy *garum* producers, especially L. Iunius Puteolanus.[24]

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[18] *Ibid.*, page 235.

[19] Berdowski, Piotr. "Roman Businesswomen 1: The Case of the Producers and Distributors of Garum in Pompeii." *Analecta Archeologica Ressoviensia* 3 (2008): 251-72. Print.

[20] Kurlansky, Mark. *Salt: a World History*. New York: Walker and, 2002. Print. Page 70-71

[21] *Ibid.*, pages 70-77

[22] Berdowski, Piotr. "Roman Businesswomen 1: The Case of the Producers and Distributors of Garum in Pompeii." *Analecta Archeologica Ressoviensia* 3 (2008): 252-72. Print.

[23] Haley, Evan W. "The Fish Sauce Trader L. Iunius Puteolanus." *Zeitchrift Fur Papyrologie Und Epigraphik* 80 (1990): 72-78. Print.

[24] *Ibid.*

Haley writes that Puteolanus began his life as the slave of the landowner Augustalis Puteoli in Campania. Like many nobles of the Roman era, Augustalis produced *garum* on his country villa. Puteolanus, working as his factor (manager of the household industry) managed to turn this small domestic *garum* production into a major empire of fish sauce, earning the estate of Augustalis culinary acclaim and attention from emperors Claudius and Nero. In return for this excellent management, Augustalis made Puteolanus a freedman. In Roman society this put him just one step above the very bottom of the social hierarchy, which was occupied by women and slaves. However, Puteolanus became extraordinarily wealthy-not just because he controlled the process of producing *garum* itself, but because he also was astute enough to control other, lucrative parts of the process-particularly, the making of the clay *amphorae* in which *garum* was shipped throughout the Roman world.[25] So far did Puteolanus ascend the ladder of class mobility that his villa in Roma was "organized on two levels, and had three atria, perystyl with a small fish pond and a private bath...mosaics, and three reception halls.[26]" He was wealthy enough to put up statues to Neptune, God of the sea, an honor that was given to the very noble and to the very rich. He was able to sponsor his sons at the college of Augustales at Suel, and his eldest son even ascended the political ranks in Rome-he served as an aedile and duovir. In the case of Puteolanus, and others like him-such as Umbricius Scaurus, Pompeii's leading *garum* exporter and also a former slave, the production of *garum* was one of the few ways that slaves and freedmen could ascend to the height of Roman society.[27]

If freedmen were at the second rung from the bottom of the Roman social order, then women are at the very bottom of the hierarchy. Largely devoid of marital rights, property rights, education and opportunities for upward mobility, women were in some ways even more disenfranchised than male slaves. However, several laws passed by Augustus in the beginning of the first century CE reformed property and inheritance laws in favor of women, and for the first time, Roman women entered the sphere of enterprise.[28] The enterprise most amenable to women in at least the first century was clearly the *garum* trade. Freedwomen worked primarily as distributors of *garum,* and were particularly important in marketing the products of major producers such as the Sestii and Scaurus. *Garum* jars were advertised primarily by the use of *tituli picti*, painted inscriptions on *garum* jars that had four main elements: "The name of the product, with the additional information about fish species and production. Second we have epithets as to the utility of the product. This obviously served a 'marketing' function...thirdly, information about the producers, and fourthly the names of the distributors of the fish sauce.[29]" Women such as Umbricia Fortunata, Eutyches, Caesi Helpis, and Vibia Agathopus are mentioned in these *tituli picti* as distributors, and there is evidence that Scaurus at least had Umbricia Fortunata head his 'marketing' division by having her create all of his 'epithets on utility.[30] ' These women obtained great wealth and a share of the industry that was comparable to their masculine counterparts; for example, Umbricia was the largest distributor of *garum, liquamen, muria and allex* in the first and early second centuries AD, beating out all masculine competitors. Clearly, the production and distribution of *garum* was an important vehicle for class mobility during the Roman period, and helped slaves, freedmen and women alike ascend the ladder of the Roman class system.

The role that *garum* played in the Roman empire was undeniably a large one-it was perhaps the most important culinary condiment, it was considered an important medicine, and even used as a pleasurable imbibement. The production of *garum* extended across the entire length of the Roman

[25] Leon, Vicki. *Working IX to V: Orgy Planners, Funeral Clowns, and Other Prized Professions of the Ancient World*. New York: Walker and, 2007. Print.
[26] Haley, Evan W. "The Fish Sauce Trader L. Iunius Puteolanus." *Zeitchrift Fur Papyrologie Und Epigraphik* 80 (1990): 72-78. Print.
[27] *Ibid.*
[28] Berdowski, Piotr. "Roman Businesswomen 1: The Case of the Producers and Distributors of Garum in Pompeii." *Analecta Archeologica Ressoviensia* 3 (2008): 252-72. Print.
[29] *Ibid.*, page 255
[30] 30 *Ibid., pages 263-365*

empire, and was an important source of social mobility for slaves, freedmen and women. However, looking at the role that *garum* played in the

Roman empire is a more shallow analysis than what is called for. It is now helpful to turn to looking at *garum* as an artifact of the material culture of the Roman world and of the period of late antiquity. To look at *garum* as an aspect of "material culture" is to look at how the production, distribution, and consumption of *garum* fits into the larger social, political and economic context of the Roman era, and of the era of Late Antiquity. Therefore, we will now look at *garum* not in terms of its primary usage, but what the usage of *garum* can tell us about the world in which it was used.

Part 2: Garum and Material Culture

Moving into the second section of this paper, we will embark on a discussion of the material culture of *garum* as it affects three areas of analysis: *garum* as a symbol of social status, *garum* as a symbol of the Roman economy, and *garum* usage as a symbol for the political ascent and subsequent decline of the Roman empire. *Garum* as a food item was both one of the most luxurious and expensive of upper-class purchases, and yet at the same time it was also the most common staple of every Roman's diet. When discussing *garum* as a luxury item reserved for the upper classes, it is helpful to use the definition of a luxury good provided by Xinru Liu in <u>Silk and Reliigon.</u> He writes that a luxury good has the following characteristics: "it must be restricted in number, difficult to obtain, obtaining it must send a social message, the obtainer should have 'special knowledge' as a prerequisite for consumption, and there should be a connection between consumption and the body of the user."[31] *Garum* in its most highly prized form fulfills all of these conditions. For example, Kurlansky notes that Apicius, the famous Roman gourmand, spent one tenth of his "considerable fortune" on a particularly find batch of Spanish *garum*, and that he "committed suicide because, having spent this money, he realized he could not long continue to eat in the style that he had chosen.[32]" *Garum* was the staple of haute cuisine for the apex of Roman society, and most of the great Roman writers-Pliny, Seneca, Martial- touched on the sorrows and joys of this condiment. Pliny called it "that liquid of putrefying matter," and Seneca called it "expensive liquid of bad fish." And yet the very best *garum*, called *garum socorium*, or "*garum* among friends," commanded astronomical prices and was considered a suitable gift for emperors.[33] In fact, the poet Martial once sent his emperor a gift of *garum* with the note "accept this exquisite garum, a precious gift made with the first blood spilled from a living mackerel.[34]" This particular type of *garum socorium* was made exclusively from mackerel in Spain. A single small urn could cost a laborer's yearly wages, and producing Spanish *garum* at one's table was a sign of wealth and power.[35]

However, as the market for *garum* grew, mid-priced and low-priced brands began to appear on the market. The largest mid-priced market for *garum* was, surprisingly, the Jewish market in Roman occupied Israel. Called *castimoniale*[36], it was guaranteed kosher, and "was made only from fish that accorded with Jewish dietary law.[37]" *Garum*-even non Kosher *garum*, was commonly made from tuna, sardines, anchovies or mackerel, all of which are themselves Kosher fish. However, the certificate of *kashrus* helped producers justify higher prices, and eventually Christians and members of Roman mystery cults preferred Kosher *garum* for its supposed "purity.[38]"

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[31] Liu, Xinru. *The Silk Road in World History*. Oxford: Oxford UP, 2010. Print.
[32] Kurlansky, Mark. *Salt: a World History*. New York: Walker and, 2002. Print. Page 70-71
[33] *Ibid.*, pages 74-75
[34] *Ibid.*, page 74
[35] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print. Page 235.
[36] "The Garum Debate: Was There a Kosher Roman Delicacy at Pompeii? - Biblical Archaeology Review." *Bible History & Archaeology Published by the Biblical Archaeology Society | Biblical Archaeology Review.* Web. 20 Jan. 2011. <http://www.bib-arch.org/scholars-study/the-garum-debate.asp>.
[37] Kurlansky, Mark. *Salt: a World History*. New York: Walker and, 2002. Print. Page 70-75
[38] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print. Page 235.

Having Kosher *garum* at one's table proved to be an acceptable middle ground between the exorbitant prices of *garum socorium* and its much more pungent low-priced relatives. It was proof that the owner "had a certain delicacy of sensibility, an interest in spiritual matters, or merely an appreciation for fine foods.[39]" In other words, *castimoniale* was the perfect condiment for middle-class Roman strivers; it gave its eaters the ability to ape Roman nobles without bankrupting themselves. The fish pastes used by the lower classes, most Roman taverns and Roman slaves were not legally given the name *garum*. To be called *garum* or *liquidamen*, a condiment had to be made of young, fresh, whole fish. But the fish-condiment eaten by the lower classes and in public houses were made of household fish scraps, and many of these sauces must have crossed the line between pungent and rotten[40]. No self-respecting member of the upper classes would eat these sauces, called *muria* or *allec*. From this analysis, it is clear that the ability to purchase certain kinds of *garum* was an indicator of social status until the fall of the Roman empire.

The economy of *garum* production and consumption can be analyzed in order to understand the larger economy of the Roman empire itself. As has been previously mentioned, *garum* production was found mostly next to the major saltworks of the Roman empire. Major centers of *garum* production included: Sicily, Byzantium, Pompeii, southern Spain (really the entire Strait of Gibraltor), Leptis Magna in Libya, Clazomenae in Asia Minor, Britain, Israel, Manilius, Lusitania, Cetobrigia, Baetica, and Mauretania in Morocco. Euxia, or the Black Sea region, modern-day Bordeaux, New Carthage-these are all cities that and even major geographic regions whose economy was mostly based upon the production of salted fish products, the most important of which was *garum*[41] The importance of *garum* production and distribution to the economies of Roman- controlled Spain, Portugal, much of coastal North Africa, and many of the islands off the coast of mainland Italy cannot be over-stated. Many of the major cities in Tunisia-Neapolis, Bulla Regio, Dougga, El-Jem, Haidra, Sbeitla and Thurbubo-Majus sprang up like flowers at the height of the *garum* craze in the between 200 BCE and 300 AD, and withered away after the fall of the Roman empire brought about an end to the wide-spread use of *garum* in the sixth and seventh centuries AD[42]. Even to this day, Neapolis has temples and museums dedicated to the salt production and *garum* processing that was centered in the region, and mosaics of fish and *garum* pepper the many Roman ruins of *garum* factories[43].

The reason that *garum* production was so central to the economy of the coastal regions of the Roman empire was that *garum* production and distribution, as an industry, created entire industrial zones. *Garum* factories had to be close to major saltworks, and also had to be either on a river mouth or an ocean, for easy transportation. This necessitated the building of shipyards near *garum* facotories; also, *garum* was transported in clay amphorae by the thousands, so *garum* factories were often surrounded by factories producing clay amphorae and other clay products.[44] Ships carrying thousands upon thousands of amphorae of *garem* and *allec* have been found off the coast of Northern France, Morocco, Turkey, and in the Black Sea[45]. Kurlansky claims that throughout the second and third centuries, *garum* was the fourth most important consumer product sold in the Roman empire, behind grain, wine, and olive oil[46]. However, as the Roman empire declined, so too did the production and distribution of *garum,* and the economies of the coastal industrial zones which were supported by *garum* manufacture were largely destroyed in the aftermath of the fall of Rome[47].

[39] *Ibid.*

[40] 40 Kurlansky, Mark. *Salt: a World History.* New York: Walker and, 2002. Print. Page 70-75

[41] Curtis, Robert I. *Garum and Salsamenta: Production and Commerce in Materia Medica.* Leiden: E.J. Brill, 1991. Print. Book

[42] Ham, Anthony, and Abigail Hole. *Tunisia.* Footscray, Vic.: Lonely Planet, 2004. Print.

[43] *Ibid.,* page 28.

[44] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print. Page 239.

[45] *Ibid,* page 239.

[46] Kurlansky, Mark. *Salt: a World History.* New York: Walker and, 2002. Print. Page 78.

[47] Toussaint-Samat, Maguelonne. *A History of Food.* Chichester, West Sussex, U.K.: Wiley-Blackwell, 2009. Print.

As Rome fell, so too did the use of *garum* as an important food condiment fall into a decline. When thinking about *garum* as a symbol of the political decline of the Roman empire, it can be helpful to look at the sales of *garum* by amphorae before and after the fall of Rome in 476. In 117 AD, 80,000 amphorae of *garum* are recorded as being transported from southern Spain and into the rest of the Roman empire by Sestimus, a Roman consul in the region[48]. By AD 242, this number has more than tripled. However, in 455, records cease being kept, and modern archaeologists believe that less than 10,000 amphorae were produced and sold in the region for the entire decade of the 450's[49]. There is a clear link between the political might of Rome, from the first century BCE and into the third century AD, and the widespread use of *garum* throughout the empire. However, Kurlansky writes,

> "after the fall of Rome...*garum* was often though of as just one of the unpleasant, hedonistic excesses for which Rome was remembered. Leaving fish organs in the sun to rot was not an idea that endured in less extravagant cultures...Anthimius, living in sixth century Gaul, in a culture that was leaving Rome behind, rejected garum 'from every culinary role.[50]'

As the yoke of Rome faded from various locales, regional cuisines re-asserted themselves in Gaul, Britain, throughout the Mediterranean and in North Africa. In fact, the entire Mediterranean region lost its importance as a salt fish producer after the fall of Rome[51].

From this discussion of the material culture of *garum* we can gather three major ideas-*garum* usage can help us understand the Roman social hierarchy, *garum* distribution and production can hep us understand the extent and nature of coastal economies, and the swift decline in the consumption of *garum* after the fall of Rome can be seen as a political referendum on the excesses of the empire, and an attempt of subjugated regions to re- assert their own cuisines.

Conclusion: The Great Mystery of Garum

Joseph Niedham, the mid-twentieth century historian of China, writes a wonderful chapter on the uses of fish paste in Asian cuisine in his book on <u>Science and Civilisation in China.</u> In this book, he makes a very interesting assertion-that "the decline and disappearance of Garum as an important condiment from the Mediterranean region, when it was held in such high regard in the first and second centuries, is a major unsolved problem in the history of food culture.[52]" It is true that it is very difficult to find evidence of the use of fish paste in the cuisine of the early Caliphs, and that the evidence which exists is certainly not as abundant as what is available during the Roman era. However,
the fish-paste of the Roman lower classes, or *muria,* does indeed continue to be used by the Sasanians throughout the seventh centuries, and in early Islamic Egypt[53]. Niedham is wrong to cite the disappearance of Garum as a major unsolved problem, because in point
of fact the name changes, but fermented fish paste does indeed live on in early Islamic food cultures. Called alternatively Murri or Muria, it was produced by brining fish with grain, and it was a "bitter black, fishy liquid similar to soy sauce.[54]" Under the Abassids, a popular poor-man's dish was "small

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[48] *Ibid.*, page 401

[49] *IbidI.*, page 4-1.

[50] Kurlansky, Mark. *Salt: a World History.* New York: Walker and, 2002. Print. Page 78.

[51] *Ibid.*, page 79.

[52] Needham, Joseph, and Ling Wang. *Science and Civilisation in China,.* Cambridge [Eng.: University, 1954. Print.

[53] Simpson, St. John. "From Mesopotamia to Merv: Reconstructing Patterns of Consumption in Sasanian Households of." *Grifitth Institute Publications* (2003): 250-80. Print.

[54] *Ibid page 256*

fish brined in salt and eater with bread, such fishes were known as *rubaytha...*[55]" This meal, brined small fish with bread, would have been a familiar one for every Roman fisherman or day-laborer.

Perhaps when Niedham laments the disappearance of *garum* from prominencewhat he is really lamenting is the lack of *garum* in the 'high culture' of the period; after the decline of Rome, fish paste becomes the food of the lower classes, and "is seldom touched by people of elegant taste.[56]" It seems then, that food in general, and *garum* in particular, can give the reader a good appreciation for patterns of food consumption as a symbol of larger social developments. As high Roman culture, and indeed the Roman social enterprise fails, the *garum* economy and fish paste as an important condiment for the wealthy declined precipitously, and the early Islamic upper class tables are littered with salts and spices, rather than amphorae of *garum*. However, there is a continuity of food cultures across the lower social classes-just as Roman laborers ate *muria,* so too did the Muslim every-man eat his or her bread with *murri.*

In summation, this paper has examined fermented Roman fish paste, or *garum*, as an aspect of the material culture from classical antiquity to late antiquity and into the early Islamic period. The first part of the paper concerns itself with the role that *garum* played in Roman society-how it was used and produced, and who produced it. The second part of this paper analyzes *garum* as a symbol of Roman material culture-how the use of *garum* denoted social standing, how *garum* affected the coastal economies of Rome, and how the fate of *garum* was tied to the political fate of Rome. The paper concludes with an attempt to solve one of the 'great food mysteries,' which turns out to be less of a mystery than an indication of the way that culture may shift dramatically among the upper classes, and yet food culture among the lower social strata retains similar elements despite major cultural and political changes. It is the hope of the author to one day imbibe of this "precious liquid," as Seneca once wrote, and to "be transported to the heavens by the pungent bliss," in the words of Martial[57]!

[55] "Amazon.com: Social Life Under the Abbasids, 170-289 Ah, 786-902 Ad (Arab Background Series) (Web. 17 Mar. 2011. <http://www.amazon.com/Social-Abbasids-170-289-786-902-Background/dp/0582780799>.
[56] *Ibid.,*page 305.
[57] Curtis, Robert. "In Defense of garum." *The Classical Journal* 78.3 (1983): 232-40. Print. Page 240.

Discovering the Characters and Functions of Turnip Peroxidase

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Peroxide catalyses the reaction to turn the harmful hydrogen peroxide into water and oxygen. We performed this experiment to examine the properties of peroxidase extracted from a turnip root under wide different range of pH and temperature and in the presence of a competitive inhibitor. We tested the properties of peroxidase by using dye-coupled reaction and observed absorbance using a spectrophotometer. The results of this experiment may reveal the parameters in which we can use turnip peroxidase commercially. This experiment showed that turnip peroxidase has optimal temperature 28°C and optimal pH 6.3: at optimal temperature and pH, turnip peroxidase has the highest activity. We found that boiling turnip peroxidase results in no enzyme activity. The conditions, in which turnip peroxidase function, determine the possible commercial applications.

Introduction

Turnip peroxidase is a basic enzyme, which is from the root of *Brassica napus*[1]. It is currently used in the medical field for a variety of purposes. In an ELISA test, it is attached to an antibody in order to check for a particular antigen. This can be used to check for some health risks, such as bladder and prostate cancer[2]. In order to understand the potential uses of turnip peroxidase, we must understand the conditions in which it can function. An enzyme increases the rate of a particular reaction. This amount of increase can be affected by temperature, pH, and the presence of a competitive inhibitor[3]. According to Fernandez et al.[4], some enzymes function very poorly at a particular temperature and are impractical for use in large quantities. We performed an enzyme lab with turnip peroxidase to figure out the reactions of the enzyme under the influence of the different factors: a wide range of pH and temperature, denaturation, and presence and absence of the competitive inhibitor, hydroxylamine. We wanted to find the effects of these factors on turnip peroxidase activity in order to find the optimal conditions. We believe that turnip peroxidase will be relatively tolerant to being boiled; however, a deviation from a particular optimal temperature and pH and the addition of competitive inhibitors will hinder it. Finding the parameters in which we can best use turnip peroxidase will shed light on potential commercial applications.

Materials and Methods
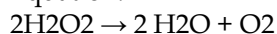
Equation:
$$2H_2O_2 \rightarrow 2\,H_2O + O_2$$
We used the procedure from on our lab manual pages 73-86, "Biological Investigations" by Dolphin,

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[1] Liu et al., 1999

[2] Mohsina Hamid and Khalil-ur-Rehman, "Potential applications of peroxidases," *Food Chem* 2009, *115*, 1177

[3] Neil Campbell and Jane Reece. 2005. Biology. 7th ed. San Francisco. Pearson education, Inc.

[4] Fernandez-Lafuente, R., Hernandez-Justiz, O., Mateo, C., Terreni, M., Fernandez- Lorente, G., Moreno, M.A., Alonso, García-Lopez, J.L. and Guisan, J.M. (2001) Biomacromol. 2, 95-104.

Warren D., 2008. The following are the modifications to the procedure:

1. Extract enzyme from turnip root.

-We used 1g of turnip in 50mL cold phosphate buffer.

2. Calibrate rate of reaction Enzyme lab was performed on June 30th 2009 at Pasadena City College Biology 1B.

-We performed the extract calibration in order to find the sample that is closest to the ideal slope. We started with 0.5 ml and 1.0mL extract solution, and then 2.0 ml extract solution.

3. Experiment temperature, pH, and a com-petitive inhibitor factors.

-We tested our sample solution at 4°C, 23.7°C, 42°C, 64.6°C, and 100°C (boiling).

4. Find optimal temperature and pH.

Results
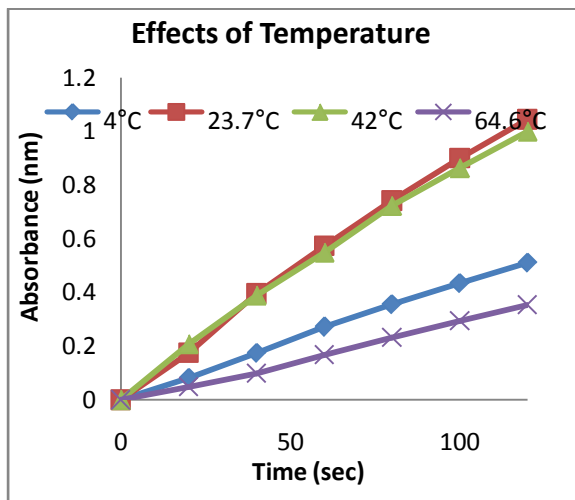
Figure 1 *Effects of temperature graph shows how turnip peroxidase reacts with different temperature ranges-4°C, 23.7°C, 42°C, 64.6°C. Each temperature gives different speed of turnip peroxidase reaction with increasing slope.*
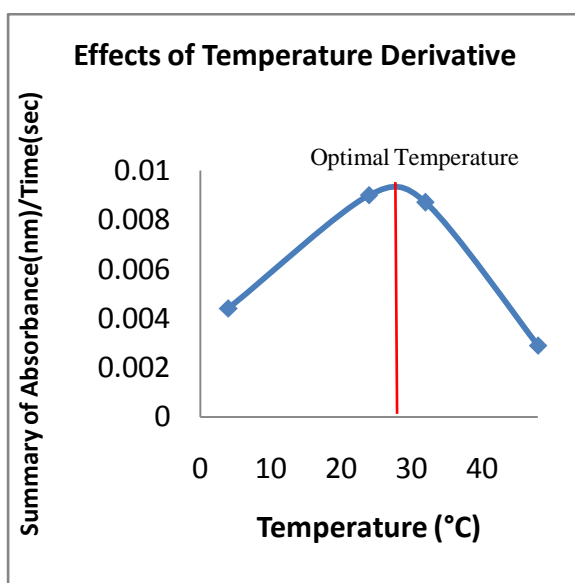
Figure 2 *Taking of the derivative of the data from figure 1 shows the rate of reaction from 4°C to 64.6°C. The rate of reaction increases until temperature reaches 28°C and decreases after 28°C. The turnip peroxidase has the highest activity at its optimal temperature, 28°C.*
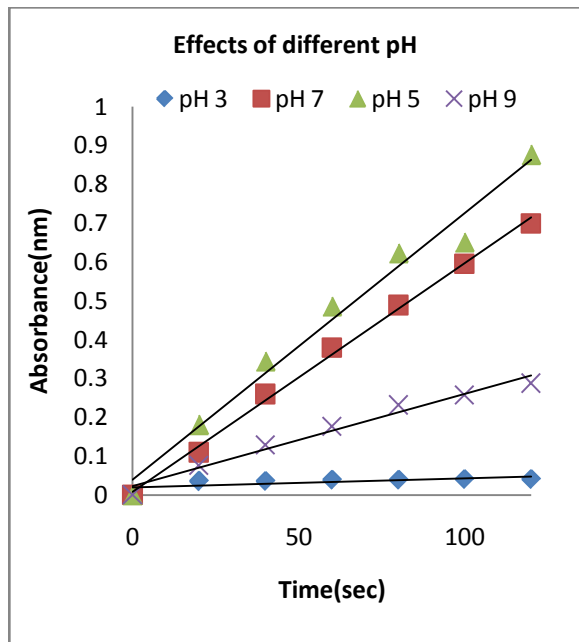
Figure 3 This shows the different rates of reaction in the pH ranges-pH 3, 5, 7, 9. Among these, pH 7 shows the most turnip peroxidase activity.
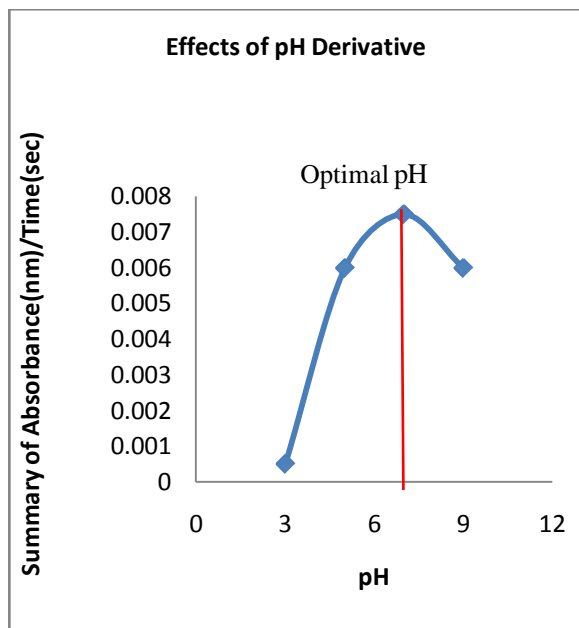

Figure 4 Taking of the derivative of the data from figure 3 shows the rate of reaction from pH 3 to 9. Before ph 6.3, the rate of turnip peroxidase reaction rises slowly; however, after pH 6.3 the rate decreases fast. The turnip peroxidase has the highest activity at its optimal pH, 6.3.
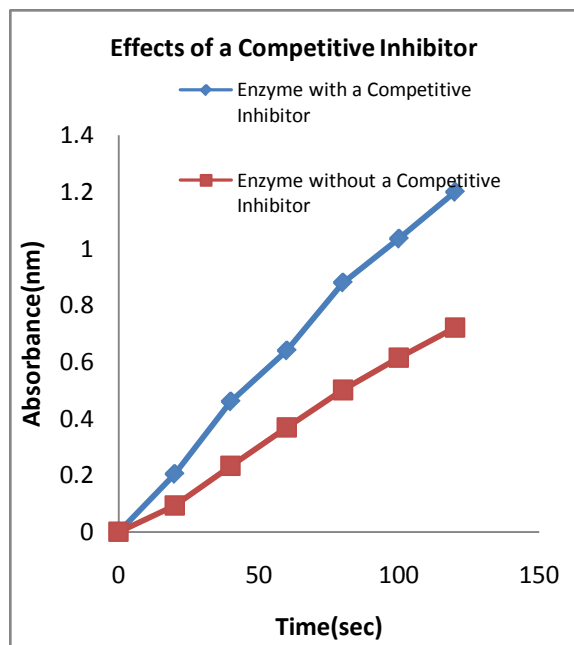
Effects of a Competitive Inhibitor

Figure 5 *This shows that rate of reaction in the presence of a competitive inhibitor and absence of a competitive inhibitor (control). Turnip peroxidase activity is greater without a competitive inhibitor.*

Discussion

In this laboratory, we examined the properties of turnip peroxidase under different pH and temperature and in the presence of a competitive inhibitor.

Figure 2 shows the change in rate of reaction as temperature changes. Our result shows that turnip peroxidase functions from 4°C to 64.6°C. The rate that turnip peroxidase reacted was the fastest at 28°C. Our results are consistent with the study by Z. L. Li et al.[1] and confirm our hypothesis: deviation from the optimal temperature results in a decrease in rate of reaction.

After boiling turnip peroxidase, we couldn't find any enzyme reaction. For example, when trypsin isoforms enzyme is boiled, most of protein is inactivated and activities was reduced[2]. Similarly, the turnip peroxidase's structure was altered sufficiently to stop its function. Consequently, we reject our hypothesis: boiling would have no effect on enzyme activity.

The rate of reaction was highest at pH 6.3 (Figure 4). Our hypothesis, pH has an effect on enzyme activity, was accepted. Turnip peroxidase reacts the faster in a mildly acidic environment.

A competitive inhibitor effect ex-periment also confirmed our hypothesis: a competitive inhibitor would have an effect on enzyme activity. Figure 5 shows that rate of reaction in the presence of a competitive inhibitor is slower than the normal extract, which has no competitive inhibitor. Turnip peroxidase normally binds to a particular site on the substrate; however, the com-petitive inhibitor, hydroxylamine, blocks this site and stops the enzyme reaction[3].

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[1] ZL Li, W Liu, XF Chen, and WL Shang, "Research on the application of horseradish peroxidase and hydrogen peroxide to the oil removal of oily water," *Water Science & Technology*, 59, no. 9 (2009): 151-9,

[2] Proteomics, 2007

[3] Neil Campbell and Jane Reece. 2005. Biology. 7th ed. San Francisco. Pearson education, Inc.

According to Maroof and Qayyum[4], the turnip peroxidase's optimal temperature was at 30°C and optimal pH was at 5.5, which was similar to our experiment results. The reason for the slight discrepancy may be due to an incomplete extraction of the enzyme, leading to a lower concentration than used to obtain the literature value. For future experiments, we need to be more careful with the extraction of turnip peroxidase.

We found that the optimal tem-perature is 28°C and optimal pH is 6.3. However, the turnip peroxidase deactivated when it was boiled. With the knowledge of the range of and optimal conditions in which turnip peroxidase functions, we can understand why they are currently being used for medical purposes in the human body. Other commercial applications with similar conditions should be looked into such as removing toxins from soil and water [5].

[4] Maroof Husain & Qayyum Husain (2007): Applications of Redox Mediators in the Treatment of Organic Pollutants by Using Oxidoreductive Enzymes: A Review, Critical Reviews in Environmental Science and Technology, 38:1, 1-42
[5] Mohsina Hamid and Khalil-ur-Rehman, "Potential applications of peroxidases," *Food Chem* 2009, *115*, 1177

Piecing Together the Modern Family

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Fifty years ago, one could sit down, turn on the TV, and come across a program such as the *Donna Reed Show* in which the mother and father were found working together to raise their children in a perfectly happy household. Nowadays, one turns on the TV and finds shows that represent the "modern" family such as the *Family Guy* where the father is a lazy bum, the mother is an incessantly nagging control freak, and the son (Stewie) has a mad obsession with taking over the world, all of which contribute to making the modern family appear as anything but jubilant. Imagine that! What has happened to cause this evolution from the once happy family which had to deal with relatively few problems, to the present family which tries to be, but is not quite the perfect traditional family. This evolution is a direct result of the complexity of the modern lifestyle. *Six Feet Under* redefines the modern family; in contrast to the traditional family, the modern family accommodates for financial instability, has a flexible structure with interchangeable roles, and lacks communication among family members. However at the same time, like the traditional family, the modern family uses the power of love to hold the family together.

Today, modern families no longer have the financial stability that the traditional family once possessed. This financial instability is the result from the increase in the cost of living. Modern families, such as the Fishers have more of a financial burden on their hands and have to consider finances when making decisions. For instance, Stephanie Coontz that the traditional family was relatively economically stable and that back then one could pay the closing costs on a new house with just one day's earnings[1].In today's world, it takes eighteen weeks to earn enough money to cover the closing costs on a new house[2]. Purchasing valuable investments such as a car, or rather a Hurst in the Fishers' case, requires careful planning. Many factors must be taken into account before actually investing in the asset, such as pricing, appearance, and durability. Financial burdens are an additional complexity that adds another factor to the list contributing to the differences between the modern family and the traditional family.

Another new factor the modern family has to deal with is flexibility. On one hand, the Fisher family is similar to the traditional family in that both include a parental figure and children. However, this modern family can accommodate for a change in the structure of its members. Barely ten minutes into the pilot episode, a tragic bus accident kills the patriarch and almost immediately, the Fisher family is sent into a state of disarray as depicted by Ruth Fisher littering the floor with everything that was on the kitchen counter. However, the moment of disarray is short lived as the death quickly brings the members of the Fisher family together to come to the aid of Ruth, their lone parent figure left. Each family member looks to take on a new role left vacant by the death of the father. Traditionally, a household is led by two parents with children, where the father either works or runs a business, the wife would be the housewife, and the oldest son would take over the family business. However, Nate shies away from the role of the traditional brother/oldest son and takes on the role of the parental figure, as Ruth and Claire both look to Nate for reassurance and comfort with their respective problems. Claire comes to Nate about her problem with drugs and Ruth goes to Nate after she confesses her infidelity to the family. Furthermore, it is the younger son, David, who untraditionally takes over the role of the patriarch by sacrificing his dream of attending law school in order to care for and attempt to provide financial stability for his family. The son demonstrates the flexibility of the modern family to accommodate for death because he successfully keeps the family business running. The show seeks to define the structure of the modern family as that with children and at least one parent, because the Fisher family is still the Fisher *family* despite the death of the father. Likewise, Gary Soto's family depicted in his article presents a similar standpoint as that of the Fisher family: that is both families are able to exist with one parental figure and children. Death was not an issue portrayed on television during the 1950s even though it undoubtedly affected families in reality. In contrast, *Six Feet Under's* representation of

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[1] Stephanie Coonntz, "What We Really Miss About the 1950s", 43
[2] Coontz, 43

the modern family perceives death as reality instead of avoiding the subject as the traditional television family such as the *Donna Reed Show* did. While the traditional family includes two parental figures and children, the modern family is able to accommodate for external factors, such as divorce or death, factors which the strict structure of the ideal traditional family did not allow for.

Just as the flexibility of the Fisher family distinguishes it from the traditional family, the inability to communicate is another aspect which sets the two types of families apart. The traditional household has a happy atmosphere to it, as reflected by all the smiles from the family in Norman Rockwell's image *Freedom from Want*. Soto describes the traditional family as living "comfortable lives" with "no beatings, (and) no rifts in the family"[3]. At the end of the day, the traditional family returns home "to a warmly lit living room"[4]. While the Fishers have rifts, they have no experience with physical abuse. The ability to communicate has a very significant influence on the family. The modern family has a difficult time communicating with one another stemming from a variety of different reasons. One such reason may be insecurity as in Claire's case. In the scene where Nate confronts Claire about her drug abuse problem, she retaliates by saying "You're not my father….you don't even know me so don't start thinking you could tell me what to do, ok?" Claire does not accept Nate's advice because she has grown up her entire life without his presence and feels insecure around Nate as a result. The Fisher family indulges itself by constantly having arguments with one another. The constant bickering between the family members stems from the fact that the Fisher family members are all initially detached from one another. Nate's sudden reintroduction into the family along with the death of the leader of the household creates unbalance, which hurts the ability to communicate. In another instance, David bluntly tells Nate to leave the family because he feels that Nate is trying to them apart, saying "You had a responsibility to this family and you ran away from it and you left it all for me……you got out, stay out." In contrast, the traditional family has never lost its ability to communicate effectively with one another. As with the *Father Knows Best* show, the father makes all the decisions within the household and what he says goes because he knows best with no questions asked. The lack of a leader/father-figure within the Fisher household results in a lack of the ability to communicate with each other, an ability which the traditional family holds strong.

Although family members nowadays tend to be more unhappy with one another than family members from the traditional family, love is still the prevailing factor that holds a family like the Fishers together. During one of the first scenes, Ruth, representing the modern wife, constantly reminds her husband about his health during a telephone conversation. However, this reminder shows that Ruth cares enough about her husband to be concerned about his health. Despite their dysfunction, the Fishers' love for one another allows them to continue on as a family. Each Fisher family member has his or her own problems as Nate describes his family to Brenda, "my mother's a whore, my brother wants to kill me, and my sister is smoking crack," and Nate himself is a "fucking mess."[5] However, despite all their differences, it is this love that allows a family member to come to each other at the end of the day. Despite their initial conflicts and arguments, Claire comes to Nate as she collapses, crying into Nate's arms at the grocery store. The death of Nathaniel Senior appears to initially tear the Fisher family apart. Eventually however, the family members resolve and become closer to one another as a result .All the family members except David seemingly come to Nate for their problems. Claire discloses her drug abuse problem to him and Ruth allows Nate to comfort her after revealing that she had been unfaithful to Nathaniel Senor for a number of years. Meanwhile, David also reflects the ideal of love holding a family together by retreating to his lover, who is a part of his extended family, for emotional support. It is love that held the traditional family together, and it is love that holds the modern family together.

The modern family has come a long way from the traditional family. Although similarities between the two are still prevalent, the modern family stems further and further away from the traditional one with each passing day as more diversity within the family is introduced and more complicated issues such as divorce come into play. Nevertheless, one important element has defined both the traditional family as well

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[3] Gary Soto, "Looking for Work" in <u>Rereading America.</u> Ed., 29

[4] Soto, 29

[5] <u>Six Feet Under.</u> Dir. Alan Ball. Perf. Peter Krause, Michael Hall, Frances Conroy, and Lauren Ambrose. Videocassette. HBO, 2001.

as the modern family .Despite their dysfunctional problems, the Fishers' feelings of love for one another hold their family together.

The Effect of the Rwandan Genocide on Governing Identities and Norms

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Due to globalization, non-state actors have become highly influential in creating new global norms in governance. As "heroes and villains in different narratives of international politics," non-state actors and their rise in prominence have led to increased friction between transnational, national, and group identities, creating "sovereignty-sensitive political systems" that exist in the present-day.[1] The ever-evolving ideas of transnational, national, and group identity "shape international agendas, […] show that non-state actors play a major part in shifting the assumptions that constitute international society, [and promote] new shared principles and norms."[2] While the identities of these non-state actors "act as the shapers and supporters of [the modern state] system," they simultaneously react to these changing norms; this complex, causal relationship is not unidirectional, but mutual and flux.[3] In this essay, I will use a case study of the Rwandan Genocide to argue that there exists a nexus between changes in the norms of governance and increased conflicts between transnational, national and group identities. I will explore and discuss the implications of the ethnic conflict on the jurisdiction of a transnational governing authority of the ICC, and show how the lack of security has created a role for mercenaries in governance.

The Rwandan Genocide is an example of the extent to which ethnic, national, and international identities can both result from and cause changing norms in global governance. Genocide is defined as carrying out "the intent to destroy, in whole or in part, a national, ethnical, racial, or religious group" through acts such as "killing, causing serious bodily or mental harm to members of the group, or deliberately inflicting on the group conditions of life"[4], among other inhumane acts. By this definition, the two ethnic groups of Rwanda, the Hutu and Tutsi, have been engaged in genocide against one another since 1994. Beliefs about the origin of the Rwandan Genocide are divided into two schools of thought, the first of which argues that Belgium implementation of indirect rule in Rwanda led "a small group of Tutsi administrators to oppress the Hutu majority, and thereby polarized and hardened ethnic identities"; the opposing school of thought argues that "Tutsi rule even before the arrival of the Europeans imposed a discriminatory two-tier system that the colonial powers formalized and institutionalized."[5] Though the exact beginnings of the polarization between the Hutus and the Tutsis may remain debatable, it is inarguable that both schools of thought mark a hierarchical distinction between the Hutu and Tutsi ethnic groups as the starting point for conflict. After longstanding civil wars between the Hutu and Tutsi, the genocide began on April 6, 1994 with the death of "moderate" President Habyarimana in a plane crash, after which "Hutu extremists blamed the Tutsi rebels for the attack and […] within hours, they commenced the genocide of Tutsi," and later "established a new 'interim' government that would oversee the killing of Tutsi."[6] The Rwandan genocide is an example of how issues in governance, such as "the struggle for political power in Rwanda [and] physical insecurity during periods of civil war," served as incentive for conflicts between two

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[1] Daphne Josselin, and William Wallace, *Non-State Actors in World Politics*, (Houndmills, Basingstoke, Hampshire: Palgrave, 2001), chap. 1, 10.

[2] Josselin and Wallace, Non-state Actors, 12.

[3] Josselin, Non-state Actors, 15.

[4] Stanton, George H. "What is Genocide" *Genocide Watch,* n.d. Web. 14 May 2011.

[5] Kuperman, A. 2001 *The Limits of Humanitarian Intervention*. Washington, DC: Brookings Institution Press. Chapter 2: Roots of the Rwanadan tragedy, 6.

[6] Kuperman, A, *The Limits of Humanitarian Intervention*, 12.

ethnic identities.[7]

On an international level, the Rwandan Genocide raised concerns about the transnational sovereignty of the United Nations, and its Convention on the Prevention and Punishment of the Crime of Genocide, in carrying out its jurisdiction against cases of genocide. Adopted on December 9, 1948, the Convention was "a major pillar in the evolving framework of international humanitarian rules [that] condemns genocide."[8] Its signatories agreed, "the crime of genocide is a justiciable offence under the Rome Statute of the International Criminal Court" (ICC).[9] However, the provisions of the Convention limited the authority of the ICC, stating " the Court may only exercise jurisdiction if the accused is a national of […] a State […] accepting the jurisdiction of the Court, the crime took place on the territory of a State […] accepting the jurisdiction of the Court, or The United Nations Security Council has referred the situation to the Prosecutor, irrespective of the nationality of the accused or the location of the crime."[10] Because these limitations indicate that the ICC has no authority to bring claims of genocide against states that have not signed the Convention, the ICC cannot completely fulfill its function as a transnational judicial authority. For example, China, Russia, and the United States have not signed the Convention; these states not only lack an obligation to appear before the court, but as permanent members of the Security Council, but also also have power to veto proposed UN Security Council referrals to the ICC. Additionally, "the ICC's biggest opponents are in Africa […] which is the scene of all cases currently being investigated or prosecuted."[11] This makes clear that ICC's weakness is that the success of its objectives is contingent on the cooperation of non-signatory states that are identified as the most prominent violators of humanitarian laws. This weakness illustrates one way in which conflicting transnational and national objectives for sovereignty exacerbate governance under globalization.

The establishment of The Convention on the Prevention and Punishment of the Crime of Genocide also represents a turning point in the notion of sovereignty and responsibility in global governance. To begin with, participating nation-states have willingly given up their national sovereignty to the transnational sovereignty of the Convention. In traditional IR theory, each state "decides for itself how it will cope with its internal and external problems"; the state existed as a sovereign political entity.[12] However, the establishment of the Convention shows that governance is moving away from state-centric theory, with nation-states enabling the UN and the ICC to enforce international jurisdiction to hold higher governing powers that itself. Additionally, sovereignty was used by the nation-states in the traditional IR system "to create a new identity that would legitimize the enhancement of state power and the coordination of policy."[13] Thus, submission of sovereignty to the UN also indicates that the identity of the nation-state is moving away from traditional identities focused on the primacy of state, and towards an identity that is increasingly dependent on its fulfillment of social responsibilities and decreasingly dependent on military and economic power. This "Logic of Appropriateness" is visible in the international community's responsibility to take legal action when the term "genocide" is used to describe widespread killing; Condolezza Rice retracted a statement after she had mistakenly used the word "genocide," because its usage would warrant a response from the international community.[14] Therefore, the Rwandan Genocide has contributed to the evolution of new transnational and national governing norms in which nation-states have resigned their national identity as a sovereign state, and turned power over to a transnational governing body. The evolution of these norms of governance rests upon their causal relationship to the friction caused by the changing transnational and national identities and responsibilities of the UN and nation-states.

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[7] Mamdani, M. 2001 *When Victims Become Killers*. Princeton: Princeton University Press. Chapter X: The civil war and the genocide, 209.

[8] "Convention on the Prevention and Punishment of the Crime of Genocide." *United Nations*. Web. 9 December 1948.

[9] "Jurisdiction and Admissibility" *International Criminal Court*, n.d. Web. 15 May 2011.

[10] "Jurisdiction and Admissibility" *International Criminal Court*, n.d. Web. 15 May 2011.

[11] "The International Criminal Court bares its teeth" *The Economist* 12 May 2011. Print.

[12] K. Waltz, "Globalization and Governance," *PS: Political Science & Politics* 32, 3 (December 1999), 267.

[13] "The Great Globalization Debate: An Introduction." D. Held and A. McGrew, ed., *The Global Transformations Reader* (Malden, MA: Polity Press, 2003), 14.

[14] Burgos, Robert. "Congo Crisis." 4 May 2011.

Beyond its representation as a source of conflict for transnational and national identities, the Rwandan Genocide also symbolizes the security trap that inflicts Sub-Saharan Africa. In Sub-Saharan Africa, traditional interstate violence has been replaced by intrastate conflicts usually directed by the government against its citizens. State-directed violence creates the security trap, in which the state whose primary function should be the enforcement and protection of its citizens' securities takes on the paradoxical role as the predominant abuser of its citizens' human rights. In this situation citizens are prevented from receiving personal, community, political, and other nontraditional securities from the corrupt state, whose national interest does not coincide with providing security for its citizens. For example, Mugabe's government in Zimbabwe has "maintained its assault on the media, the political opposition, civil society activists, and human rights defenders," clearly rejecting security and human rights as a national interest, thereby subjugating its citizens to a security trap.[15]

Furthermore, the lack of security has led to the structural failure of Sub-Saharan Africa under globalization, as its combined unstable political, social, and economic climate has deterred foreign direct investment and prevented economic development. Because states either "cannot, or will not protect citizens, […] individuals and groups [are] taking up arms for self-protection, or to defend interests that their state can no longer guarantee."[16] The demand for security has led to a profitable market for mercenaries, private companies for hire that "are foreign to the conflict […] motivated chiefly by financial gain."[17] In Sub-Saharan Africa, private security force Executive Outcomes "fills a special security void: most African governments lack a capable combat force, and until, or unless, government-sponsored intervention becomes a reality, some market will remain for EO's services."[18] This shows that the "provision of public service [by] private actors" such as EO represents a shift in new market norms; security is now a commodity available to all individuals that do not receive protection from the state.[19] As organizations that remain unaffiliated with a single state, mercenaries represent the larger influence of "transnational economic actors […] that transmit […] influence and […] external intervention" within the state.[20] Mercenaries have also led to changes in governance, as their capacity to make war dispels the "monopoly on the legitimate use of physical force in the enforcement of [state] order" that was characteristic of the state under IR theory, and extends governance beyond the state level to non-state actors.[21] Mercenaries that provide security in Sub-Saharan Africa represent the increasing "influence of transnational private actors in international and domestic politics."[22]

This shift in the norms of governance can be seen in change in legitimacy of mercenaries from the time of the Katanga Secession in the 1960's, to the use of Executive Outcomes by the government of Sierra Leone in 1995. This change in legitimacy simultaneously exemplifies the rising friction between the nation state's identity as a war-making power, and changing identity of mercenaries as producers of coercion. The Katanga Secession took place during "a period of turmoil in the First Republic of Congo that began with national independence of Belgium and ended with the seizing of power by Joseph Mobutu."[23] As the region with the richest copper and gold in the First Republic of Congo, Katanga was an area of interest for several Belgian mining businesses, and a key contributor to the economic assets of both countries. In July of 1960, leader Moise Tshombe led the Katangi secession using "several hundred European mercenaries, many of which were recruited in Belgium" as "the core of the Katangan forces" and defenders of independence.[24] Because state centrism and the primacy of the nation-state in the international system was a stable norm

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[15] Human Rights Watch "Zimbabwe: Events of 2006" *World Report 2007.* Print.

[16] Brayton, S. 2002. Outsourcing war: mercenaries and the privatization of peacekeeping. *Journal of International Affairs* 55, 304.

[17] Brayton, S, Outsourcing war, 306.

[18] Howe, H. 1998. Private security forces and African stability: the case of executive outcomes. *Journal of Modern African Studies* 36, 326.

[19] Mamdani, M. 2001 *When Victims Become Killers*. Princeton: Princeton University Press. Chapter X: The civil war and the genocide, 191.

[20] Josselin, Non-state Actors, 1.

[21] Mamdani, M., When Victims Become Killers, 191.

[22] Josselin, D. 2001. Non-state Actors in World Politics. Chapter 1, 12.

[23] Burgos, Robert. "Congo Crisis." 4 May 2011.

[24] Burgos, Robert, "Congo Crisis".

during the time of the Katanga Secession, the UN refused to recognize the secession and deemed it unlawful because it relied heavily on the work of mercenaries, not political entities.

In contrast to the mercenaries of 1960 that were deemed illegitimate by the UN, Executive Outcomes is arguably "the most deadly and efficient army operating in Sub-Saharan Africa today" and boasts a history of employers that include the governments of Angola and Sierra Leone.[25] In the case of Sierra Leone, EO was contracted in 1994 by the state "to help its faltering four-year campaign against the Revolutionary United Front," which had caused its "economy [to] lay in shambles," and "one and a half million of Sierra Leone's 4 million people [to] become refugees."[26] When Sierra Leone contracted EO, The Republic of Sierra Leone Military Forces (RSLMF) only had "14,000 soldiers, two-thirds of which had been hastily recruited, and lacked basic military professionalism."[27] EO provided RSLMF with "technical services, combat forces, and limited training," which led to a cease-fire that significantly "aided Sierra Leone's economic and political situation."[28] EO's success was so profound that UN negotiator General Ian Douglas acknowledged, "EO gave us this stability [in Sierra Leone]. […] I'd be loath to say they have to go just because they are mercenaries" (181); his statement is significant because, as a representative of the UN, he recognized the extent to which EO effectively ended conflict in Sierra Leone. The employment of EO by the African governments shows that nation-states not only accept the legitimacy of mercenary groups, but also actively participate in and perpetuate the market for private security forces. The ability of mercenaries to "start up to deploy faster than multinational forces, […] carry less political baggage, [… possess] a clearer chain of command […], and [possess] greater experience working together" gives it an advantage of state-centric militaries that may be attractive to the state.[29] Further, mercenaries embrace their identity as a profit-oriented organization acting upon a new economic, rather than political, logic for violence. Though it is argued, "EO will never gain full political acceptance," in the present day, the EO and other mercenaries and private military companies have already gained more legitimacy from the international community and expanded the war-making identity of the nation state to the private market.[30] Thus, as the market for mercenaries and private security forces continues to change, the identities of both the mercenaries the nation-state employs and those it opposes should be expected to continue to evolve and create new norms.

The advent of transnational actors such as the ICC and the legitimacy of mercenaries specializing in security and war-making power, commodities once exclusive to the sovereign state, have led to shifts in international norms of sovereignty, responsibility and governance. Because these actors' transnational and group identities conflict with the national identity of the state, the ICC and mercenaries have caused, and continue to cause new "major definitional, historical, and normative issues" in governance. In the larger scheme of globalization, the continued engagement in governance of non-state actors such as the ICC and mercenaries, and beyond to TNCs and NGOs, may lead to an international community where the primacy of the state is overwhelmingly replaced by a global society with a heightened sense of responsibility for the protection of human rights, and an economic logic rather than militaristic logic for power.

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[25] Howe, H, Private security forces and African stability, 308.
[26] Howe, H, Private security forces and African stability, 313.
[27] Howe, H, Private security forces and African stability, 313.
[28] Howe, H, Private security forces and African stability, 313.
[29] Howe, H, Private security forces and African stability, 308.
[30] Howe, H, Private security forces and African stability, 328.

Gendered Emoticon Used in Public and Private Online Conversation: =(, :o), >:(

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I investigated the gendered use of emoticons in online public and private conversations to determine whether males or females used more emoticons online as well as to determine how their usage differed. My interest in this field was fueled by observations in my online conversation with my friends. I noticed that my female friends used more emoticons than my male friends. Data was collected from three males and three females and each participant provided two online conversations with males and two with females. They also provided their most recent walls posts to two females and two males. The results of this study were consistent with my hypothesis and indicated that females tend to use emoticons more frequently than males in their private conversations. Males used emoticons when speaking with females more than when speaking with males. Females tended to use more emoticons when speaking to other females. In public wall posts, males were less likely to post emoticons than females. The use of emoticons by males in public postings was even lower than those recorded in private conversations. This study found that society's perception of the role of males and females directly affects their behavior and their willingness to be expressive.

Introduction

With the dawn of the technological age, new modes of communication have been introduced to society. Verbal communication and letters are not the only way to communicate anymore. Nowadays, people also use the Internet to communicate by writing emails, using instant messenger, and conversing with others in chat rooms. With the introduction of Facebook, an online social networking website, people can also communicate with others publicly by posting messages on friends' Facebook walls. The telephone and face-to-face verbal conversations allowed for the addressee to understand the attitude of the speaker because the addressee could hear the change in tone. The Internet has allowed for a new place for conversations to occur; however, these are written conversations. Similar to face-to-face conversations and telephone conversations, these Internet conversations are dialogues between two people where the two individuals can actively type to each other and respond to one another. Unlike verbal conversations however, there is no tone in the speaker's voice or change in pitch to convey the writer's attitude when typing a statement. This has lead to the invention of a new Internet language that is composed of emoticons, or symbolic ideograms that portray the writer's mood or facial expressions. Emoticons allow the emotions or attitudes that the speaker wants to convey to be seen in written text. For example: there are emoticons that depict happiness, like this smiley face :D. There are also emoticons that convey sadness like =(and some that convey anger >:(.

In many languages around the world a gendered use of lexicon has been observed, where women are found to use certain phrases or words either exclusively or more often than men are. The focus of this study is to determine if a gendered use of emoticons occurs in private Internet conversation and if the use of emoticons to convey emotions differs in conversations between same-sex individuals and opposite-sex individuals. This study will also look at how the use of emoticons in private online conversation differs from the use of emoticons when writing to someone in a more public setting on Facebook.

My interest in the gendered use of emoticons was triggered when I began to notice that my females' friends tended to use emoticons more frequently than my male friends. When I asked people around me to indicate whether a male or a female wrote the statement, "Hi =)" many more people speculated that the writer was a female. It is a very simple statement with only one word; however many people did not hesitate to state the writer was a female because of the presence of the emoticon. This led me to wonder if the use of emoticons actually varied between males and females.

The effects of online emoticon usage have been studied only minimally. Past research on the online use of emoticons concentrates on their use in more public settings. For example, Calvert and Huffaker did a study on the gendered use of emoticons in online blogs, or Internet journals. The study looked at blogs that were not directed at an audience of a specific gender and they found that there is not a significant difference between male and female writers in the use of emoticons in this case.[1] However, is there a measurable difference in the type of emoticons and the frequency of emoticon use among male and female writers when the audience is a specific gender? Although there is minimal research on this, similar concepts have been applied to more general types of interactions. For example, it has been widely accepted that disclosing emotions establishes a sense of camaraderie. It causes two people to bond and connect on a more personal level. According to previous studies, women have developed a sense of camaraderie in all female-groups, but in mixed groups where males are present this camaraderie breaks down.[2] There is also a sense of camaraderie in all-male groups, but this camaraderie is a result of sharing jokes and talking about common interests. On the other hand, the instances of camaraderie between women are a result of embracing and sharing confidences to one another. Lakoff's study concluded that women are more likely to bond by sharing how they feel whereas men bond by talking about similar interests. Since emoticons convey emotion, I speculated that my study would find that women would be more likely to use emoticons when having same-sex conversations than males would be.

According to many studies, the lexicon of women differs significantly from what is considered the male lexicon. Descriptive words and adjectives have neutral forms and forms that are considered more feminine because they convey more emotion. For example, Lakoff concluded that there are neutral adjectives like great, terrific, cool, and neat and there are woman's adjectives that include words like adorable, charming, sweet, and lovely.[3] Although both men and women use adjectives in the neutral category, very few men use adjectives that fall into the category that Lakoff labeled as woman's adjectives. According to Lakoff, this was because these adjectives are more expressive and society labels women as more expressive than males. Applying this concept to online conversation, women would be expected to use emoticons more than males. Not only this, but males would be less likely to use them in a public setting where many individuals can see that they have been used.

In terms of topics discussed, women tend to talk about activities that are more likely to include expressive information. For example, Zemskaja observed in their research that women tend to talk about general or humanistic topics like nature, animals, daily life, whereas men tend to talk about technology, sports, hunting, and professional matters.[4] In the latter group, there is very minimal opportunity for males to convey emotion and be expressive because their topics of discussion are more concrete.

There has been a significant amount of research done on the expressive nature of male and female conversation, but how does this apply to online internet conversation? There are many different emotions males and females can express from happiness, sadness, anger, frustration and worry. With the creation of emoticons, most of these emotions can be expressed online. Keyboard symbols have been used in different combinations to express almost every simple emotion. The current body of literature concludes that females are more expressive in their conversations than males. Balswick and Peek suggest that inexpressiveness is a

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[1] Sandra L. Calvert, and David A. Huffaker, "Gender, Identity, and Language Use in Teenage Blogs ," *Journal of Computer-Mediated Communication*, 10, no. 2 (2005),

[2] Robin Lakoff, *Language and Woman*, (New York: Octagon Books, 1976), 52-7, 64-83.

[3] Robin Lakoff, "Language and Woman's Place," *Language in Society*, 2, no. 1 (1973): 45-80,

[4] Zamskaja 1993

culturally induced trait that is characteristic of many males.[5] They suggest that females, on the other hand, are encouraged to be expressive by being gentle and responsive. With a new location for conversation, the findings of past research needs to be examined to determine if their results are consistent with occurrences in online interactions. My research question for this study is: How does emoticon use in online private conversations differ amongst males and females between the ages of eighteen and twenty-two at University of California-Los Angeles and how does this compare to differences in emoticon use between males and females in public wall postings on Facebook? In this study, my hypothesis is that males will use emoticons less frequently in their private conversations than females. Males will also tend to use more emoticons when chatting with their female friends than when chatting with their male friends. On the other hand, females will be more prone to using emoticons when talking to other females than when talking to males. In addition to this, females will display emoticons in public posts more often than males. The purpose of this study is to determine if there is a quantitative difference between the number of times males and females use emoticons in private conversations with people of the same sex and with people of the opposite-sex. It also aims to determine if there is a difference in the types of emoticons used and if these differences are also present in more public conversations.

Methods

As previously mentioned, with the introduction of the technological age, conversations found a new home in internet 'chat rooms' and this has led to the creation of a new language, a language with emoticons. Emoticons are images formed by the use of symbols on the keyboard. They are icons that typically depict the emotion of the user. In a conversational setting where tone and facial expressions of the speaker cannot be discerned from the text, emoticons provide information to the addressee on the emotions the writer wants them to perceive.

The methodology designed to test the hypothesis examined transcripts of private Internet conversations and public wall posts collected from carefully selected participants. In this study, I collected data from three males and three females. Each participant provided me with four private Internet conversations: two 'chatting' with someone of the same-sex, and two 'chatting' with someone of the opposite-sex. This information was provided to me as a transcript and any names that were present in the conversation were removed. I instructed the participants to do this so fear of disclosure of any information in the conversations would not skew the language and use of emoticons in the conversation. All of these conversations occurred online using messengers like MSN messenger, iChat and AOL Instant Messenger because they provided private locations for two individuals to have conversations and all of these programs allowed the use of emoticons. In addition to this, the participants provided me with their last two wall posts to their male friends and last two wall posts to their female friends. All of these forms of communication occurred on the Facebook website. This website was chosen because it is widely used amongst the population being studied.

Online Internet conversations were considered private conversations in this study because only those involved in the dialogue were able to see the conversation. Wall posts, on the other hand, were considered public because they are also visible to the other users of Facebook and not specifically those involved in the conversation and therefore both sexes can see the posts. All the participants of this study were twenty to twenty-one year-old heterosexual students that attend the University of California, Los Angeles. This age range was chosen because people of this age are avid users of online messengers for private conversations and social networking websites. All participants were from Los Angeles to prevent location-specific lexicon from altering my data. Also, all individuals in this study were heterosexual in order control for any sexual-orientation specific lexicon. The participants were chosen based on their use of Facebook and an online messaging service as well as willingness to provide transcripts of their

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[5] Jack Balswick, and Charles Peek, "The Inexpressive Male: A Tragedy of American Society," *The Family Coordinator*, 20, no. 4 (1971): 363-8,

conversations. No two participants were friends in order to ensure that multiple conversations in this study did not involve the same two individuals.

After the collection of data, I analyzed the number of times emoticons appeared in the private online messenger conversations as well as the public wall posts. I tallied the number of times emoticons were used into three categories: same-sex male conversations, same-sex female conversations and mixed-sex conversations. The total number of words exchanged electronically in the female same-sex conversations, male same-sex conversations as well as the mixed-sex conversation was also determined (one emoticon was considered one word). I then divided the number of emoticons by the number words and multiplied this by one hundred in order to normalize the length of data and determine what percentage of the written conversation were emoticons. This was done for both same-sex categories and the two percentages were compared to determine which gender used emoticons more frequently in private conversations. The mixed-sex conversations were further analyzed by determining the number of emoticons used by females and males respectively in these conversations. The number of emoticons used by females was divided by the total number of emoticons present in these conversations and multiplied by one hundred to calculate what percentage of the overall emoticons used in private mixed-sex conversations was a result of female use.

In addition to this, emoticon placement and emoticon type were analyzed. Conversations were analyzed to determine in which part of the conversations emoticons were most concentrated in both same-sex and mixed-sex conversations, respectively. Emoticons were divided into three categories: positive, negative and neutral. Positive emoticons were considered those that expressed joy, happiness, or affection. For example: =) (smiling face) and <3 (heart) were considered positive emoticons. Emoticons that expressed anger and grief were considered negative. For example, =((sad face), =/ (worried face), and </3 (broken heart) are negative. Neutral emoticons are those that resemble objects (example: ---> for an arrow). The number of positive emoticons, negative emoticons and neutral emoticons were determined for female same-sex and male same-sex conversations (Refer to Appendix C for a list of commonly used emoticons). The type of emoticons used in mixed-sex conversations by males and females was also determined. In addition to this, the topics discussed in each conversation were documented to see if the topic of conversation in all-male and all-female conversations affected emoticon use.

The data collected on the use of emoticons in public wall posts was analyzed similarly. Wall posts written by the males in the study on a female's wall and a male's wall were tallied separately. This was also done for wall posts written by the females in the study. The numerical data was then compared to determine if males or females used more emotions in public postings. The data was also used to determine if females used more emoticons when posting on the walls of females or males. These results were compared to the results found from private conversations to determine if there were any significant discrepancies.

Results

Section 1: Emoticons Used In Private Conversations

The conversations collected from the two males and two females in this study were analyzed in the following categories: Same-sex female, same-sex male, and mixed-sex. When analyzing all the data, regardless of the category, this study found that amongst the twenty-four conversations analyzed a total of 197 emoticons were exchanged in conversation. Of the 197 emoticons, 177 were used by women and 20 were used by men. Using statistical analysis, this indicates that females accounted for 89.85% of the emoticons used. This data was further analyzed in 3 subcategories: Same-sex females, Same-sex males, and Mixed-sex conversations.

Section 1.1: Same-Sex Females in Private Conversations

The table below shows the breakdown of negative, neutral, and positive emoticons used in each same-sex female conversation in this study.

Table 1: Same-Sex Female Private Conversation Emoticon Usage

	Negative Emoticons	Neutral Emoticons	Positive Emoticons	Total Number Used	Emoticons Per Word Used
Female 1 with AF1	15	0	2	17	17/628= 2.7%
Female 1 with AF2	9	3	30	42	42/1162= 3.6%
Female 2 with AF1	15	0	5	20	20/940= 2.1%
Female 2 with AF2	2	1	3	6	6/126= 4.8%
Female 3 with AF1	2	0	9	11	11/924= 1.2%
Female 3 with AF2	4	1	5	10	10/703= 1.4%
Totals:	47	5	54	106	106/4483= 2.4%

Note: AF stands for anonymous female

Table 1 shows the data recorded for all same-sex female conversations in this study. Within the same-sex female private conversations, the females were just as likely to use positive emoticons as negative emoticons. The difference between the total number of positive emoticons used (54) and negative emoticons (47) did not vary significantly. The number of neutral emoticons was significantly lower than positive and negative emoticons used as they appeared only five times in over 4000 words. The number of emoticons used per word of text sent varied from 1.2% to 4.8% depending on the individuals in the conversation. The overall percentage of emoticons used was 2.4% which is a sizable portion of the conversation given that the word count of all the individual conversations exceeded one hundred words and went as high as 1162 words.

Based on the fact that 106 emoticons were used in same-sex female conversations and 177 emoticons total were recorded being used by females, 59.88% of all female emoticons appeared in same-sex female conversations.

Section 1.2: Same-Sex Male Private Conversations

The table below shows the breakdown of negative, neutral, and positive emoticons used in each same-sex male conversations in this study.

Table 2: Same-Sex Male Conversations Emoticon Usage

	Negative Emoticons	Neutral Emoticons	Positive Emoticons	Total Number Used	Emoticons Per Word Used
Male 1 with AM1	0	0	0	0	0/83= 0.00%
Male 1 with AM2	0	0	0	0	0/89= 0.00%

Male 2 with AM1	0	0	3	3	3/861= .35%
Male 2 with AM2	0	0	0	0	0/123= 0.00%
Male 3 with AM1	0	0	0	0	0/1567=0.00%
Male 3 with AM2	2	0	0	2	2/117= 1.7%
Totals:	2	0	3	5	5/2840= .18%

Note: AM stands for anonymous male

Table 2 shows the data recorded for all same-sex male conversations in this study. Within the same-sex male conversations, there is a marked decrease in the number of emoticons used. The same-sex male participants had conversations where absolutely no emoticons were exchanged between the 'chatters.' Four out of six of the conversations between two males had zero emoticons used. In the remaining two conversations with emoticons, there did not appear to be a preference for the use of positive or negative emoticons. There were a total of five emoticons used in all same-sex male conversations. In terms of emoticons per word, it was calculated to be .18%, which is a very insignificant portion of the words used in conversation.

Section 1.3: Mixed Sex Private Conversations

The table below shows the breakdown of negative, neutral, and positive emoticons used in each mixed-sex conversations in this study.

Table 3: Mixed-Sex Conversation Emoticon Usage

	Negative Emoticons	Neutral Emoticons	Positive Emoticons	Total Number Used	Female/Total Emoticons
Male 1 with AF1	F: 2 M: 0	F: 0 M: 0	F: 2 M: 0	F: 4 M: 0	4/4= 100%
Male 1 with AF2	F: 0 M: 2	F: 0 M: 0	F: 4 M: 0	F: 4 M: 2	4/6= 66.7%
Male 2 with AF1	F: 0 M: 0	F: 0 M: 0	F: 3 M: 1	F: 3 M: 1	3/4= 75%
Male 2 with AF2	F: 3 M: 0	F: 0 M: 0	F: 3 M: 0	F: 6 M: 0	6/6= 100%
Male 3 with AF1	F: 1 M: 1	F: 0 M: 0	F: 2 M: 0	F: 3 M: 1	3/4= 75%
Male 3 with AF2	F: 0 M: 1	F: 0 M: 0	F: 3 M: 0	F: 3 M: 1	3/4= 75%
Female 1 with AM 1	F: 5 M: 0	F: 1 M: 0	F: 3 M: 1	F: 9 M: 1	9/10= 90%
Female 1 with AM 2	F: 3 M: 0	F: 1 M: 0	F: 9 M: 0	F: 13 M: 0	13/13= 100%
Female 2 with AM 1	F: 3 M: 0	F: 0 M: 0	F: 1 M: 1	F: 4 M: 1	4/5= 80%
Female 2 with	F: 5	F: 0	F: 6	F: 11	11/19= 57.9%

AM 2	M: 3	M: 0	M: 5	M: 8	
Female 3 with AM 1	F: 1 M: 0	F: 3 M: 0	F: 2 M: 0	F: 6 M: 0	6/6= 100%
Female 3 with AM 2	F: 3 M: 0	F: 0 M: 0	F: 2 M: 1	F: 5 M: 1	5/6= 83.3%
Totals:	F: 26 M: 7	F: 5 M: 0	F: 40 M: 9	F: 71 M: 16	71/87= 81.7%

Note: AM stands for anonymous male, M stands for male, AF stands for anonymous female and F stands for female

Table 3 shows the data recorded for all the mixed sex conversations in this study. Within the mixed-sex conversations, females tend to prefer using positive emoticons in comparison to negative emoticons, whereas males showed no preference. Table 3 also illustrates that females tend to use significantly more emoticons in private mixed-sex Internet conversation than males did. Females used a total of seventy-one emoticons and males used only sixteen. This results in females accounting for 81.7% of the total emoticons. In all private conversations, females used significantly more emoticons than males did, except for the case of the conversation between "Female 2 and AM 2" where Female 2 used 11 emoticons and AM 2 used 8.

Section 1.4: Comparison of Quantitative Emoticon Use in Same-Sex Female, Same-Sex Male, and Mixed-Sex Private Conversation

The numerical analysis above reflects that females tend to use more emoticons in private internet conversations than males do. In a same-sex setting, females tend to use significantly more emoticons than their male counterparts. The highest number of emoticons in a same-sex female conversation was forty-two, whereas in same-sex male conversations the highest was only three. Females were more consistent in their use of emoticons in same-sex conversations as well. Every female in this study used at least one emoticon in a private internet conversation, whereas it was more common for males to not use any at all. When comparing same-sex female conversations to mixed-sex conversations, we see that females use a significantly greater number of emoticons when speaking with another female. Of the 177 emoticons used by females, 109 occurred in same-sex conversations. Also, when comparing same-sex female emoticon use with that of mixed-sex, we observe that females are more likely to use negative emoticons conveying anger and sadness when speaking with another female. As seen in Table 3, 31 of the seventy-one emoticons used my females in mixed-sex conversation conveyed positive emotions. On the other hand, in same-sex female conversations only 47 of 109 emoticons used by females conveyed positive emotions (Table 1). This is a lower percentage of the total.

When comparing male same-sex conversations to female same-sex conversations, we see that for males emoticons comprise a drastically lower percentage of the overall conversation than is seen in female conversation. Overall 2.4% (Table 1) of the words used by females are emoticons, whereas only .38% (Table 2) of the words used by males are emoticons.

Looking at same-sex male conversations and mixed-sex conversations, we see that males used more emoticons when 'chatting' with females than when chatting with other males. Males used a total of sixteen or 76.2% of their emoticons when 'chatting' with females, whereas they only used five or 23.8% when 'chatting' with other males.

Section 1.5: Private Conversational Analysis

In the internet conversations, some females tend to use emoticons in their greeting or their initial statement. For example in Female 2's conversation with anonymous female (AF) 2 the conversation started with, "I cut my hair =)." Females also did this when writing in mixed-sex conversations. However, in this study, males never started a conversation or responded directly to a greeting with an emoticon. For example, in Male 1's conversation with AF 2, the female starts the conversation by saying, "BTTTT!!!!" (the addressee's initials); however, the male in the conversation replied only with a "Heyyyy" (Appendix A: Sec 4.2).

In addition to this, some females ended a conversation with an emoticon. For example, in Female 1's conversation with AF 2, the conversation ended with the participant saying "k. Bye. Have fun! =)" (Appendix A: Sec 1.2). Again, this is also observed in mixed-sex conversations with only the female using the emoticon. For example, in Female 1's conversation with AM1, the participant ends the conversation with "ill ttyl good night! =)" The male's response to this is simply a "good night" (Appendix A: Sec 1.3).

Since males did not use emoticons at the beginning of the conversation or at the end of the conversation, all the emoticons used by males in mixed-sex conversations were found in the body of the conversations. In this study, males mostly used emoticons when an emoticon had already been introduced into the conversation by a female. For example, in Female 2's conversation with AM 2 even though the male in this conversation used a significant number of emoticons, the male did not start to use emoticons until Female 2 had already used them.

The use of emoticons in same-sex male conversations is rare. It was only observed in two of the six conversations recorded. In both of these cases, the emoticons were used in response to a statement by the other individual. For example, in Male 3's conversation with AM2, Male 3 asks the addressee if he is busy on Tuesday and the addressee later responds with "I can't go =(" (Appendix A: Section 3.4). In this case, the emoticon is not accompanied by voluntary information, but instead is used as a response. On the other hand, in female conversations emoticons were used to voluntarily provide the addressee with additional information. In Female 1's conversation with AF1, the participant states "my math class is full...=(" (Appendix A: Section 1.1). This statement is not a response to a question or statement by the other individual. It is information that is provided by the speaker voluntarily.

Topics Discussed in Private Conversations

The table below shows the topics discussed in all-male and all-female conversations.

Table 4: Topic Discussion Data

	Same Sex Conversation 1	Same Sex Conversation 2
Female 1	Class enrollment issues	Shopping trip
Female 2	Argument between friends, presents	New haircut
Female 3	Boys, daily activities	Difficult midterm, birthday
Male 1	Bank visit	Band, girls
Male 2	Plans	birthday
Male 3	Medical School application	Extracurricular activities

Table 4 illustrates that in a private setting, males and females discussed different topics with someone of the same-sex. Females tended to talk about their response to specific events that happened during the day or generally what they did that day, while males tended to simply state specific events or

discuss their career plans. For example Female 1 discussed class enrollment issues with one female friends and a shopping trip with another female friend. Male 2, on the other hand, discussed plans to go to visit Berkeley with one of his friends and birthday plans with another.

Section 2: Public Wall Posts

Table 5: Wall Posts Data

Participant	Male 1	Male 2	Male 3	Female 1	Female 2	Female 3
Total Emoticons Used	F: 1 M: 0	F: 0 M: 0	F: 0 M: 0	F: 1 M: 1	F: 1 M: 2	F: 1 M: 1

Note: F stands for wall posts for a female and M stands for wall posts for a male

Table 5 illustrates that in a public setting most males no longer use emoticons. There was one exception to this case as indicated above. In all the wall posts collected, Females used a total of seven emoticons whereas males only used one. Male 1 used an emoticon in the wall post, "super like =);" this wall post was directed at a female (Appendix B). This is a significantly different from female usage because all females used at least one emoticon in their wall posts. Unlike what was observed in private conversations, females did not favor emoticon use when posting on females' walls in comparison to males' walls. All females used an emoticon in at least one male wall posting and one female wall posting.

Looking at the types of emoticons used, in this study all public conversation emoticons were positive emoticons. The emoticons used by the participants included "=), =D, and ;)." The first two emoticons represent happy faces, while the last one is a wink face. There was no preference for type of emoticon for females posting on walls of females compared to walls of males. For example, Female 3 wrote "Aw I miss you too =D..." on anonymous male 1's wall. When posting on a female's wall, Female 3 wrote, ";) show aubrey too!!" (Appendix B).

In addition to this, in all cases of emoticon use only one emoticon was used per wall post. In private conversations, both males and females used multiple emoticons in a conversation; however, in public wall posts, only one emoticon was used.

Men and women both tended to post on their friends walls with statements regarding plans and questions they had. Since wall posts make it difficult for entire conversations to occur, these statements were brief. For example, Female 3 posted on AM1's wall asking, "What are you doing this weekend?" Similarly, Male 2 wrote on AF1's wall asking, "Lunch tomorrow?"

Discussion

Most of the results of this study coincide with the hypothesis set forth prior to data collection. As previously mentioned, women tend to use emoticons more in same-sex conversations than men tend to. In this study, it was found that it was more common for men to use no emoticons at all when talking with other males than it was for them to use emoticons. Lakoff reported that women were more prone to discuss and embrace emotions in order to show camaraderie.[6] This explains the elevated use of emoticons in conversations between two women. Females include this information in their conversation to build a connection with the addressee. Lakoff's study also indicated that there is more camaraderie in all-male groups than in all female-groups. Although it appears as if this contradicts the findings of this study, displays of male of camaraderie are shown through telling jokes, back-slapping and discussing common

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[6] Lakoff, 1973

areas of interest and these forms of camaraderie do not involve active use of emoticons and cannot be applied to internet conversation. In this study we found that males were more likely to talk about specific events and career related topics. Females on the other hand discussed daily activities like shopping as well as issues surrounding specific people. This agrees with Zemskaja et 's findings that men tend to discuss topics such a sports, events, work, and future plans, whereas women tend to take about daily activities and people.[7] Emoticons are used more in topics that involve emotion. Since women encountered more topics where emoticon usage was more appropriate, they used more emoticons in conversation.

Even in cases where both the males and females were involved in similar conversations, males used fewer emoticons than females. For example, females used a significant amount of emoticons in their salutations, including both those at the start of the conversation and those at the end. In this case, since there is no specific topic being discussed the discrepancy between emoticon use between males and females cannot be solely accounted for by the difference in topic. This indicates that women are more willing to be expressive when conversing with people than males are. Since this phenomenon was observed in both same-sex conversations and mixed-sex conversations, it can be concluded that when talking about neutral topics, those categorized as being neither typical male or typical female topics, women are still more expressive than males. As can be seen in the results, every female used at least one emoticon in every conversation that they had. There are two likely explanations for why this occurs. It is likely that women are more expressive because they try to find a bond or connection in their conversations, whereas men are more direct in their conversations. In addition to this, there is societal pressure that depicts males as "macho" and displaying emoticons is stigmatized as female behavior. These results agree with what Balswick and Peek stated in their study, American boys grow up in a society where they are told to embrace expressions of masculinity and devalue expressions of femininity.[8] Masculinity is "expressed largely through physical courage, toughness, competitiveness, and aggressiveness, whereas femininity is in contrast expressed largely through gentleness, expressiveness and responsiveness.[9] Because expressing emotions and responding to the display of emotions is considered feminine, males do not use emoticons as much to avoid the stigma that would result from there use. In modern day, when a male is overly expressive, he is often labeled as being effeminate and even called "gay."

In male same-sex conversations there is not a prevalence of emoticons. When an emoticon is used, the males are responding to a question that is posed or a statement by another person. It is not voluntary disclosure of their emotional state. This again can be seen as another example of how men try to conform to society's pressure to be more masculine. By not outwardly expressing their emotions unless asked or probed, men give the appearance that they are indifferent. This is typically a characteristic that is associated with being masculine.

In mixed-sex conversations, this study found that males used more emoticons when conversing with females, whereas the number of emoticons used by females decreased when talking to males. This indicates that males were more willing to break away from societal pressures constraining them to be more masculine when they are speaking with women. However, even in this case men only used emoticons once they had already been used by the female in the conversation. Males in this study were never the first ones to use an emoticon in a mixed-sex conversation. As mentioned previously, women used emoticons when chatting with other women because emotions showed a sense of camaraderie. In her study Lakoff concluded that in mixed groups, the camaraderie between women broke down and was not as visible.[10] This can also be applied to explain online emoticon use. In mixed-sex online conversations, the camaraderie is no longer present so the use of emoticons by women goes down drastically. A possible explanation for this is that women are often stigmatized for being overly emotional and sensitive. In a same sex conversation, women may feel comfortable displaying their emotions without feeling judged, whereas in a mixed-sex conversation, the presence of a male in the conversation may make females more conscious of their expressiveness.

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[7] Zemskaja et 's 1993
[8] Balswick, 361-8
[9] *Ibid*, p.364
[10] Lakoff, 1976

The initial hypothesis at the beginning of this study stated that women would be more likely to be expressive through the use of emoticons when talking to females than when talking to males. However, it was expected that females would be more likely to use negative emoticons when speaking with females than when speaking with males. The actual results of this study; however, found that there was no preference for type of emoticon used when two females were talking. Females tended to use an equal amount of positive emoticons and negative emoticons. Despite the apparent discrepancy between the results and hypothesis, females tend to be less inclined to convey sadness when speaking to males than females. Therefore, although there was no preference for negative or positive emoticons when speaking to other females, they were reluctant to disclose negative emoticons when speaking to males. This can be attributed to the fact that the sense of camaraderie that is present in the all-female is not present in mixed-sex conversations. Because of this, women are less likely to discuss issues involve sadness and anger. Whereas in conversations with women, females are more likely to convey these emotions because they think the addressee will understand and will be more willing to respond accordingly without scrutinizing them.

When these results are compared to those found in the public wall postings on Facebook, very similar conclusions can be made. In public postings, males were no longer willing to include emoticons in their text even when writing to females. As mentioned previously, men disclosed emotional information when speaking to females because the societal pressure to conform to the "macho" male attitude was no longer as strong in a private setting. However, in a public atmosphere even if the wall post is to a female friend, other people, including males, are able to view this wall post and able to scrutinize and judge the male writer. Because of this, males are less likely to be expressive and more likely to be neutral in their speech.

Females, on the other hand, used significantly less emoticons in public conversations than in private and they showed no preference for posting emoticons on females' walls. This can be attributed to the fact that females were less likely to discuss emotional topics out of fear of being scrutinized as overly sensitive and emotional. In the case of public posts, women were more likely to make statements about plans, ask questions about school, and respond to questions. Since women are no longer discussing people and daily activities, their statements were more direct and less expressive than they were in private conversations.

The similarity in emoticons use by females when posting on males and females walls is consistent with Lakoff's assertion that the camaraderie between women breaks down in a mixed group of people.[11] Since wall posts are public, even though women are directly posting on the walls of other women, the audience is still considered mixed because everyone is free to view the post.

The discrepancy between emoticon use in public conversations as well as private emoticon use based on gender leads us to ponder the question: Why does society shape our actions so strongly? As the results of this study illuminate, the expressiveness of a person in a conversation is tied deeply to the behavior society deems standard for a particular gender. According to Travis, "a society's division of labor between the sexes is the engine of sex-differentiated behavior because it summarizes the social constraints under which men and women carry out their lives."[12] In other words, "since men and women occupy different roles in society they become psychologically different to adjust to these roles".[13] Children grow up learning these standard roles and throughout their lives the majority of male and females typically subconsciously conform to this standard. They modify their actions in different circumstances based on what is considered acceptable by society. For example, business professionals are depicted as rational, logical individuals so one could expect a drastic decrease in online expressive behavior in a business woman of high authority. Since there is a significant difference between male behavior and female behavior and their current roles in society, their daily behaviors tend to reflect this concept. Females are raised with society depicting them as motherly, nurturing, and polite so it is common for women to mirror these notions and be more expressive. However at the same time, there is a negative stigma associated with females being overly sensitive and emotional. This has caused women to have varying degrees of expressiveness in a private

[11] Lakoff, 1973
[12] Cheryl Travis, *Evolution, Gender, and Rape*, (Boston: MIT Press, 2003).
[13] *Ibid., 265-6.*

setting and public setting as the results indicate. Males, on the other hand, are raised with society depicting them as strong and confident, where showing emotion is seen as a sign of weakness. Most children grow up with the concept of the "alpha male" or the ultimate male and this concept has effected how males live their lives. This study strongly illustrates that the societal pressure that controls male and female behavior has translated over to internet space and can be seen in both public and private internet conversation. This study gives insight on the extent societal perceptions effect males and females behavior.

With the introduction of a new realm for conversation to take place, it is imperative that online conversation continues to be studied with respect to other characteristics that are considered to be apart of "woman's language." Although the conclusions of this study are still valid, the length of the transcripts limited the number of participants that could participate in this study. This calls for additional research to be conducted in other aspects of online conversation. The internet age has allowed people to express their opinions and thoughts much easier than before. Prior to the internet, the only hope of spreading your word was to get an article or book published. With the invention of the internet, blogs and online forums have been introduced where people can write their daily activities, opinions and thoughts for the world to see. Studying the use of emoticons by male and female blog writers will help to further answer the questions introduced by this study. Another possible direction for future research is to look at blogs and internet conversations to see if other aspects of "woman's language," like tag questions and hedging is present online conversation.

Major Depression over the Life Cycle

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Introduction and Statement of the Problem

Over fourteen million Americans are annually affected by major depression, which is the primary cause of disability for people of ages fifteen to fourty-four[115]. The effects of major depression are often far-reaching and detrimental. According to Mental Health America, depression is the main cause of the thirty thousand suicides that occur each year in America.[116] Furthermore, depressive disorders take a toll on the economy of the United States. The productive time lost as a result of depression in American workers is estimated to be over thirty-one billion dollars each year.[117]

The American Psychiatric Association (1994) outline the set of symptoms which indicate clinical depression as "(1) depressed mood, (2) loss of interest in pleasurable activities, (3) loss of appetite, (4) sleep disturbance, (5) fatigue, (6) feelings of worthlessness and guilt, (7) difficulties in thinking and concentration, (8) psychomotor disturbances, and (9) suicidal notions for at least a two-week period."[118] However, this paper is concerned with major clinical depression, which requires the report of at least the first two symptoms and three others.[119] Rates and effects of depression vary during the life cycle, "an underlying order or sequence of seasons through which the human life must pass."[120] Many factors have been associated with depression for different ethnicities and genders, among others.

Thus, this paper will examine major clinical depression over the life cycle through the biospsychosocial perspective, an interdisciplinary approach. This framework amalgamates the viewpoints of biology, the study of living organisms with reference to origin, growth, reproduction, structure and behavior; psychology, the study of the mind or of mental states and processes; and sociology, the study of the origin, development, organization, and functioning of society.[121]

Exploring the factors related to major depression is a key to increasing understanding of this disorder and consequently improving treatment. Moreover, it is important to examine the interplay between various factors, such as socioeconomic status and ethnicity, in cases of major depression. Preventing depression in various contexts by identifying related factors of the disorder would help in avoiding further damaging effects. For instance, Hooyman and Kiyak stated, "Lower income, less education, and acculturation are associated with cognitive impairment, as are higher levels of diabetes, cardiovascular disease, and symptoms of depression."[122]

In addition, there is a prevalence of major depressive disorder in women, but among "older adults in general, Latinos are more likely to experience depression than whites or African Americans, which tends to be related to their low socioeconomic status (SES), chronic economic strains, high rates of diabetes, and short-term financial crises."[123] According to Hooyman and Kiyak, "Immigrant or refugee status and living

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[115] "The Numbers Count: Mental Disorders in America," last modified June 26, 2008, http://wwwapps.nimh.nih.gov/health/publications/the-numbers-count-mental-disorders-in-america.shtml.

[116] "Ranking America's Mental Health: An Analysis of Depression Across the States," last modified December 11, 2007, http://www.nmha.org/files/Ranking_Americas_Mental_Health.pdf

[117] Ibid.

[118] As cited in Jill Quadagno, *Aging and the Life Course: An Introduction to Social Gerontology* (New York: McGraw-Hill, 2007), 162.

[119] Quadagno, *Aging and the Life Course.*

[120] Ibid,168.

[121] R. Effros, personal communication, September 30, 2009.

[122] Nancy Hooyman and H. Asuman Kiyak, *Social Gerontology: A Multidisciplinary Perspective* (Boston: Allyn & Bacon, 2010), 623.

[123] Hooyman and Kiyak, *Social Gerontology,* 624.

alone tend to be associated with depressive symptoms."[124] Through empirical research, Morsink et al. found a biological relationship between sex steroid hormone levels and depressive symptoms, which could lead to further studies and research for anti-depressive treatment.[125] Furthermore, Foster and MacQueen stressed the validity and significance of asking questions regarding the ways personality traits affect depression because this could result in the refinement of many neurobiological measures, tests and conceptualizations.[126]

A better understanding of major depression in society is also highly necessary because it could prompt more individuals to seek treatment swiftly and willingly. According to Hooyman and Kiyak, when people suffering from depression postpone treatment, their delays can further intensify their depressive conditions, causing both a sense of fatalism and a number of health problems with long-term effects.[127] Unfortunately, afflicted individuals wait for nearly a decade on average before receiving treatment, and perhaps more significantly, less than a third of the people who request treatment receive sufficient care.[128]

Methods

I obtained information from online sources and through visiting the UCLA Powell Library. Using the UCLA online library, I accessed article databases for reliable sources of empirical data on major depression and its related factors. I conducted research through PsycINFO via CSA Illumina by browsing empirical methodology with keywords that included: major depression, psychosocial factors, SES, gender*, suicide, eld*, victim*, cause, underlying, ethnicity, and biological factors. The descriptors and references from useful articles were used to find further information. In addition, I used the Quadagno textbook of the cluster General Education 80 for the definition of major depression and its symptoms. Personal communication from fall and winter quarters of the cluster provided a definition of the biopsychosocial perspective, and chapters from Hooyman and Kiyak's *Social Gerontology: A Multidisciplinary Perspective* were valuable in elucidating the harm of major depression and its association with various biospsychosocial factors.

Findings

Turner, Finkelhor, and Omrod used data from the final two waves of a three-wave longitudinal study on eleven to eighteen year old youth in the United States to analyze how three forms of adolescent victimization affect both self-concept and symptoms of depression.[129] The behavior researched included any sexual, nonsexual, and peer victimization that occurred within the year previous to the study.[130] The study took into account the social factor of abuse as well as the biological factor of gender. Wave II had a total of 754 respondents, which was 75.4 percent of the baseline sample, and Wave III included 523 respondents, which was 70 percent of the Wave II sample.

According to Turner et al., "The psychosocial processes by which different forms of childhood victimization lead to emotional and behavioral problems" are not as well understood as the relationship between mistreatment of children and sexual abuse to developing the disorder.[131] Turner et al. found a relationship between gender and depression when females reported more symptoms than males, but no other sociodemographic factors were notably associated with major depression. Furthermore, higher levels of depression were related to greater reductions in self-concept, and sexual victimization that occurred within the previous year was linked with alterations in self-esteem as well as changes in depressive levels. However, Turner et al. (2010) stated that peer and nonsexual victimization do not factor into self-concept

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[124] Ibid, 624.

[125] Morsink et al., "Associations Between Sex Steroid Hormone Levels and Depressive Symptoms in Elderly Men and Women: Results from the Health ABC Study," *Psychoneuroendocrinology* 32 (2003).

[126] Jane Foster and G. MacQueen, "Neurobiological Factors Linking Personality Traits and Major Depression," *Canadian Journal of Psychiatry* 53 (2008).

[127] Hooyman and Kiyak, *Social Gerontology.*

[128] "Ranking America's Mental Health: An Analysis of Depression Across the States."

[129] Heather Turner, David Finkelhor, and Richard Ormrod, "The Effects of Adolescent Victimization on Self-Concept and Depressive Symptoms," *Child maltreatment* 15 (2010).

[130] Ibid.

[131] Ibid, 76.

even though they appear to affect depressive symptoms both directly and significantly.[132]

Reductions in self-esteem, which were due to victimization, affected females more than their male counterparts, and this suggests that adolescent girls more commonly compare themselves to peers, who consequently play a more significant role in the self-development of adolescent girls.[133] Moreover, Turner et al. stated that this effect on females might stem from a gendered response to stress because research has shown that girls have a greater propensity for exhibiting stress through internalizing symptoms, which include depression and anxiety, unlike the male propensity for externalizing symptoms, such as substance abuse. The researchers concluded, "It may be that the particular characteristics associated with victim exposure . . . have more direct consequences for children's self-processes because children often attribute their victimization to their own characterizations or failings."[134]

Mannarino, Cohen, Deblinger, and Steer conducted an earlier study on a sample of 164 biological mothers of sexually abused children (SAC) to determine the incidence of self-reported depression among such women.[135] The sample of mothers included 109 Caucasians, 47 African-Americans, 7 Hispanic Americans, and 1 self-described biracial woman. Of these subjects, 42% were dysphoric, and 26% were clinically depressed.[136] Dysphoria is a state of unease or depression. In the study, the only relevant sexual abuse variable was found to be whether the sexual abuser of the child had been the mother's husband or lover. Therefore, the severity of depression in women of SAC may be more related to feelings of betrayal.[137] According to Mannarino et al. (2007), in most of these cases, the relationship between the mother and her husband or paramour ended once knowledge of the sexual abuse was made clear, and the broken relationship as well as the stressful thrust into single parenthood may have contributed to the woman's depressive levels. Furthermore, depression in maternal figures has been shown to negatively impact adolescent adjustment.[138] And compared to mothers of non-sexually abused children, the mothers of SAC report worse levels of depression and other forms of emotional distress, and these mothers are more often identified as suffering from psychiatric issues, including personality disorders.[139]

For a study of the psychological and social factors related to depression, Musick and Wilson considered the effect of volunteering on the disorder by using data from a multi-wave study called the *Americans' Changing Lives* (ACL) study.[140] Musick and Wilson drew information from three waves of the ACL: Wave I, a second wave in 1989 with a sample size of 2,867, and a third wave in 1994 with a sample size of 2,348. The subjects were age twenty-five or over and living in the United States. According to Musick and Wilson, African Americans and adults sixty years of age or older were sampled at twice the rate of adults who were younger than sixty and not African American. Volunteering and depression were found to have the strongest association in the elderly, and commitments to volunteering showed a benefit to older adults' mental health.[141] Notably, Chambre (1987) pointed out that volunteerism

> among the elderly…occurs in the context of a different set of obligations than it does among younger people, for whom volunteer work is much more closely tied to demands of work and family. Among the elderly, there is much more scope for choice, and this in turn increases the chances of positive health outcomes.[142]

However, Musick and Wilson stated that volunteering positively affects younger people as well through the reduction of depressive symptoms, but a qualification exists: the volunteering must be sustained for a longer

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[132] Turner, Finkelhor, and Ormrod, "The Effects of Adolescent Victimization."

[133] Ibid.

[134] Ibid, 86.

[135] Mannarino et al., "Self-Reported Depression in Mothers of Children who have Experienced Sexual Abuse," *Journal of Psychopathology and Behavioral Assessment* 29 (2007).

[136] Ibid.

[137] Ibid.

[138] As cited in Ibid.

[139] As cited in Ibid.

[140] M.A. Musick and J. Wilson, "Volunteering and Depression: The Role of Psychological and Social Resources in Different Age Groups," *Social Science & Medicine* 56 (2003).

[141] Ibid.

[142] As cited in Ibid, 261.

duration of time.[143] Furthermore, church-related volunteerism was found to affect depressive symptoms more than volunteering in secular environments, and religious volunteers displayed a greater overall commitment to integrating volunteerism into their lives.[144] Musick and Wilson provided a rationale behind these findings:

> Religious congregations, as the organizational basis of volunteer work, help reinforce the value of caring better than secular organizations because of the way social relationships are defined within them. The more value attributed to the caring role, the more clearly institutionalized that role is, and the more rewarded it is within the community, the greater the individual benefits to be derived from it.[145]

Volunteers in all the age groups were engaged in more informal social interaction, but attending meetings was the only behavior that aided in decreasing the number of reported depressive symptoms, and this positive effect was only related to the elderly.[146] Therefore, Musick and Wilson specified that formal, not informal, interaction positively affects mental health.

Furthermore, low socioeconomic status has been linked to major depression. In studying poverty and material hardship, Heflin and Iceland analyzed the data collected during two waves of the Fragile Families and Child Wellbeing Study.[147] This longitudinal survey consists of a sample size of 4,500 children, and the survey follows newborns and their parents, who live in twenty different cities in America. Heflin and Iceland discovered positive associations between all five forms of material hardship in the Fragile Families Study and increased risks for depression. The material hardship considered in the data included bill payment, free food, turned off phones, no medical care, and unstable housing. Problems paying bills and having the phone turned off were found to be most significantly associated with depression.

Moreover, Heflin and Iceland found that poor health is a notable and important factor associated with increased risks of depression.[148] And in regards to race, Hispanics in the study were found to face a lower risk than whites, while African Americans and whites face the same risk. For females, the odds of depression are higher if the woman has been separated, widowed, or divorced. Heflin and Iceland noted that

> having income to needs ratios of less than 2.0 is statistically indistinguishable from living in poverty….The odds ratio of the top income to needs ratio category indicates, for example, that women whose family income is four times the poverty line are just over half as likely to report depression as women with family incomes below the poverty line.[149]

Therefore, being above the poverty line does not guarantee freedom from depression. Heflin and Iceland concluded that hardships can affect health both directly and indirectly, and other possible ways exist in which income can take a toll on mental health, such as the chronic stress induced by residing in poverty-stricken communities.

According to Dombrovski et al., younger adults exhibit higher rates of attempted suicide than the elderly; but for the elderly population, there is a higher probability of death through suicide in almost every country in the world.[150] The lethality of suicide attempts is highest in old age, so the medical severity of such a choice is highest as well "perhaps because a more serious intent to kill oneself leads to a choice of more lethal means."[151] In a study of 125 adult subjects with major depression and ages ranging from fifty to ninety-one years, Dombrovski et al. found greater lethality of attempts at suicide in male subjects over age seventy compared with those aged fifty to sixty-nine. According to Dombrovski et al., this was partially explained by the effects of higher suicidal intent in older men. Reversely, the study found that attempt

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[143] Musick and Wilson, "Volunteering and Depression."
[144] Ibid.
[145] Ibid, 268.
[146] Ibid.
[147] Heflin, Colleen and J. Iceland, "Poverty, Material Hardship, and Depression," *Social Science Quarterly* 90 (2009).
[148] Ibid.
[149] Ibid, 1061.
[150] Dombrovski, Alexandre et al., "Sex Differences in Correlates of Suicide Attempt Lethality in Late Life," *The American Journal of Geriatric Psychiatry* 16 (2008).
[151] Ibid, 905.

lethality was lower in older rather than in younger women. The suicidal actions of older men were, therefore, found to be more decisive than those of older women.

Moreover, Dombrovski et al. stated, "The impact of clinical predictors on suicidal intent did not differ significantly between men and women, as shown by the lack of interactions between sex and age group."[152] To place the results in context, Dombrovski et al. noted, "Suicide rates in United States women in 1999–2004 peaked between the ages of 40 to 54 and then declined in older age groups."[153] Therefore, middle-aged and young-old women exhibit a greater susceptibility to successful suicide attempts. Dombrovski et al. consequently considered the effect of biological factors on suicidal behavior by noting that estradiol and other hormone levels fluctuate swiftly during perimenopause, and these rapid changes might negate the protective effects existing in women in the form of certain biological factors.

In a study to determine such biological links to major depression, Morsink et al. found that a decrease in levels of certain sex steroid hormones result in an increased number of depressive symptoms.[154] Sex steroid hormone levels decline with age, so this conclusion correlates with the increase in rates of deaths by way of suicide in the elderly. The subjects of the study consisted of 2,855 men and women, who were aged 70-79 and members of the well-functioning elderly population.

Total testosterone levels were linked with major depression in white women while Dehydroepiandrosterone sulfate (DHEAS) seemed to be extremely significant for white men.[155] In keeping with the question Dombrovski et al. posed regarding estradiol, Morsink et al. stated that this hormone exhibits an important association with depression because low levels of estradiol may result from low levels of testosterone in elderly women.[156] Estradiol releases neurohormones and neurotransmitters that appear to significantly relate to depression. However, the effects of sex steroid hormones on depression could also be indirect, and these findings may vary between black and white elderly. Morsink et al. found an inverse relationship between DHEAS levels and depressive symptoms, which was supported by other studies, an understanding of the hypothalamic-pituitary-adrenal axis, and the finding that DHEAS affects neurotransmitter systems like anti-depressive medication.

Concluding Discussion

The interrelationships between biological, social, and psychological factors are both extensive and complex in regards to major depression across the life cycle. The biopsychosocial perspective aids in untangling the complex factors and examining the effects of both treatable and untreatable factors of major depression. However, it is often difficult to distinguish between causes and effects. The discussion will consider factors and effects of depression in various stages over the life cycle.

For children and adolescents, various forms of victimization considerably affect depression, and victimization of a sexual nature was found to be associated with a damaged self-concept.[157] Therefore, social factors play a role in depression for younger individuals and in childhood development. However, the main factor affecting the severity of depression in mothers of sexually abused children was found to be a sense of betrayal rather than the degree of abuse to which the children were subjected.[158] Consequently, it seems that the psychological aspect of the severity of depression can be unpredictable and even counterintuitive, and not as many studies have been conducted purely on the psychology behind the disorder as on the social aspects because the psychological realm often bleeds into the biological.

Later in the life cycle, the social factors related to depression are extensive. For individuals over age twenty-five, formal interaction and religion-related volunteerism show positive effects on mental health, especially for the elderly.[159] Ethnicity and gender, two biological factors, also affect depression in the face of material hardship, further displaying the diverse effects of interrelated factors. Material hardship is a lack of

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[152] Ibid, 909.

[153] Ibid, 911.

[154] Morsink et al., "Associations Between Sex Steroid Hormone Levels and Depressive Symptoms in Elderly Men and Women: Results from the Health ABC Study," *Psychoneuroendocrinology* 32 (2007).

[155] Ibid.

[156] Ibid.

[157] Turner, Finkelhor, and Ormrod, "The Effects of Adolescent Victimization."

[158] Mannarino et al., "Self-Reported Depression."

[159] Musick and Wilson, "Volunteering and Depression."

access to certain resources, so it raises the issue of accessibility, which requires an open door of services.[160] Lack of accessibility is related to major depression and worthy of attention because it is a social issue often easier to remedy than other issues, such as the biological factors of the disorder.

Furthermore, depression is a significant concern in the final years of the life cycle as well. Suicide is an issue among the elderly, especially considering the higher lethality of suicide in later years. According to the National Institute of Mental Health, over 90% of suicide victims suffer from a mental disorder, which is most often drug addiction or depression.[161] White men age eighty-five and older exhibit the highest rates of suicide in the United States today, and despite the higher number of attempts made by women, more men die by this means.[162] Dombrovski et al.'s finding in 2008 that older men and middle-aged women have a greater vulnerability for attempt lethality implies the need for greater attention to these groups, for decreasing depression would prevent a significant number of suicides.

Often, social factors are easier to alter than biological factors. As people age, the number of their sex steroid hormones decreases, so Morsink et al.'s findings on DHEAS levels and depression have various medical implications regarding treatment. However, their findings vary for black and white elderly.[163] More studies are required to determine the true variations in DHEAS levels between ethnic groups as they age as well as to verify the more specific impact of hormones on major depression. Therefore, the issue of appropriateness, which can refer to the right level and type of care,[164] is a relevant consideration in future treatment and research, especially because Morsink et al. found that the effects of DHEAS on neurotransmitters are similar to those of anti-depressive medication.[165] Mental health care should be more personalized, and physicians should take into account all the factors that are known to affect depression depending on the patient's ethnicity, age, gender, etc. Fewer studies on depression have been conducted including minority groups, so the health care field may not be able to address the issue of appropriateness as well for all patients. For many studies that did include minority groups, such as Mannarino et al.'s study on mothers of SAC, the larger portion of subjects was Caucasian.

Like all else, studies on depression have their limitations. For example, using the Fragile Families data for their study, Turner et al. were restricted to a sampling of a single cohort.[166] Therefore, their results possibly reflect a cohort effect and need not apply to every American experiencing material hardship. In addition, many findings related to depression stem from various waves of longitudinal studies, and like in most such studies, attrition of respondents for successive waves might have impacted results.[167] This is most notable for the *Americans' Changing Lives* (ACL) study, which Musick and Wilson used to examine the impact of volunteerism on the elderly.[168]

Cross-sectional studies are generally less expensive but not as extensive as longitudinal studies.[169] According to Schatzberg, when researching the biology behind depression, cross sectional techniques can blur the lines separating cause and effect.[170] Therefore, the majority of such findings cannot be labeled as irrefutable fact. More longitudinal studies are necessary to make causal inferences. Nevertheless, both cross-sectional and longitudinal studies unearth clues that can lead to a better functioning and more contented society.[171] The cited findings aid in emphasizing that further social, biological, and psychological studies on major depression are significant and deserve continuation. In fact, Takeshita et al. acknowledged a biological link that presents major and unsettling implications when they found a relationship between depression and

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[160] Damron-Rodriguez, JoAnn, Steven Wallace, and Raynard Kington, "Service Utilization and Minority Elderly: Appropriateness, Accessibility, and Acceptability," *Journal of Gerontology and Geriatric Education* 15 (1994).
[161] "The Numbers Count: Mental Disorders in America."
[162] Ibid.
[163] Morsink et al., "Associations Between Sex Steroid Hormone Levels and Depressive Symptoms."
[164] Damron-Rodriguez, Wallace, and Kington, "Service Utilization and Minority Elderly."
[165] Morsink et al., "Associations Between Sex Steroid Hormone Levels and Depressive Symptoms."
[166] Turner, Finkelhor, and Ormrod, "The Effects of Adolescent Victimization."
[167] Musick and Wilson, "Volunteering and Depression."
[168] Ibid.
[169] Quadagno, *Aging and the Life Course.*
[170] Schatzberg, Alan, "Major Depression: Causes or Effects?" *The American Journal of Psychiatry* 159 (2002).
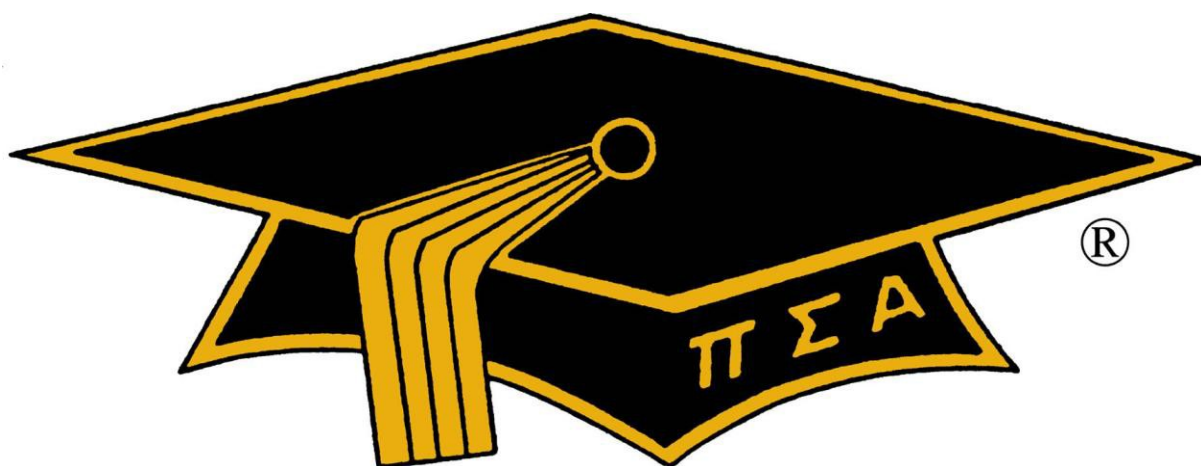[171] Ibid.

early deaths.[172] The effects of this disorder certainly seem far-reaching and often destructive, and both treatment and understanding can only improve upon further research.

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[172] As cited in Ibid.

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