# The Penn State McNair Journal

Summer 2009, Volume 16

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**THE PENN STATE MCNAIR JOURNAL**

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McNair Scholar Articles

# WELCOME

Since 1991, the Penn State McNair Scholars Program has enriched the lives of students at Penn State. The McNair Program holds a very special place in our lives, as well as in the lives of the faculty and staff who work with our students. This publication celebrates their achievements and we offer it to our readers with pride and pleasure.

This is the sixteenth issue of the Penn State McNair Journal. We congratulate the 2009 Penn State McNair Scholars and their faculty research advisors! This journal presents the research conducted in the summer of 2009 by undergraduate students from Penn State who are enrolled in the Penn State McNair Scholars Program.

The articles within this journal represent many long hours of mutual satisfying work by the Scholars and their professors. The results of their research are published here and have also been presented at various research conferences around the country. We are especially proud to see how these students have grown as researchers and scholars. The hard work, dedication, and persistence required in producing new knowledge through research is most evident in these articles.

We very much appreciate the guidance, expertise, caring and patience of our fine group of Penn State faculty research advisors. For their ongoing support and assistance, we thank Graham Spanier, President of Penn State University; Rodney Erikson, Provost of Penn State University; Eva Pell, Senior Vice President of Research and Dean of the Graduate School; Regina Vasilatos-Younken, Associate Dean of the Graduate School, and Suzanne Adair, Assistant Dean and Senior Director of the Office of Graduate Educational Equity Programs, the administrative home of the McNair Scholars Program.

We are also fortunate to have the support and encouragement of many faculty and staff members who have worked with our students as social mentors or who have presented workshops and seminars on the many aspects of graduate and faculty life. You give the most precious of gifts to our students – your time in volunteering to support, encourage and nurture our Scholars' hopes and dreams.

*Teresa Tassotti*

**Project Director**

# TRIO PROGRAMS ON THE NATIONAL LEVEL

Since their establishment in the mid-sixties as part of Lyndon Johnson's War on Poverty Program, the federal TRIO Programs have attempted to provide educational opportunity and make dreams come true for those who have traditionally not been a part of the educational mainstream of American society. The TRIO programs are funded under Title IV of the Higher Education Act of 1965. While student financial aid programs help students overcome financial barriers to higher education, TRIO programs help students overcome class, social and cultural barriers to higher education. There are eight TRIO programs, which include the original three – Upward Bound, Talent Search and Student Support Services. The additional programs are Educational Opportunity Centers, Upward Bound Math & Science Centers, the Ronald E. McNair Post-Baccalaureate Achievement Program, a dissemination program, and a training program for TRIO staff. McNair programs are located at 204 institutions across the United States and Puerto Rico. The McNair Program is designed to prepare participants for doctoral studies through involvement in research and other scholarly activities.

# TRIO PROGRAMS AT PENN STATE

The 11 TRIO Programs at Penn State comprise six of the nine TRIO programs. There are two Educational Opportunity Centers, one in Philadelphia and the other serving southwestern Pennsylvania, two Talent Search Programs serving western Pennsylvania and the city of York, Ronald E. McNair Scholars Program, four Student Support Services Programs, Upward Bound, and Upward Bound Math & Science. These programs annually serve more than 6,000 students, from 6th graders through adults, all with clear potential for academic success. The programs operate at the following Penn State campuses: University Park, Wilkes-Barre, Greater Allegheny, and the Pennsylvania Institute of Technology. The programs also operate in communities across the state, often linking with middle schools, high schools, and community agencies. The programs focus on helping students overcome economic, social, and class barriers so that they can pursue education beyond high school.

# MCNAIR SCHOLARS PROGRAM AT PENN STATE

Designed for low-income and first-generation college students, and students from groups underrepresented in graduate education, the McNair Scholars Program at Penn State encourages talented undergraduates to pursue the doctoral degree. The program works closely with these participants through their undergraduate career, encourages their entrance into graduate programs, and tracks their progress to successful completion of advanced degrees.

The goal of the McNair Program is to increase graduate degree attainment of students from the above-mentioned underrepresented segments of society. McNair Scholars are presented with opportunities to study and do research in the University's state-of-the-art facilities in order to hone those skills required for success in doctoral education. Through both academic year and summer program components, McNair Scholars are required to complete a series of steps that lead to their application and enrollment in a graduate program of their choice.

Since 1991, the McNair Scholars Program at Penn State has helped 191 students earn their baccalaureate degrees. Of these graduates, 146 or 76 percent have gone on to graduate school at institutions across the country and overseas. As of September 2009, 30 or 16 percent have earned their doctoral or professional degrees and another 71 or 37 percent have earned their master's degrees only. Currently, there are 60 or 31 percent of alumni who are still enrolled in graduate programs. Among the institutions McNair alumni have attended or now attend are: Arizona State, Boston University, Cornell, DePaul, Harvard, Howard, Indiana University-Bloomington, Johns Hopkins, New York University, Ohio State, Penn State, Purdue, Rice University, Stanford, Temple, Texas A&M, UCLA, University of California-Berkeley, University of California-Davis, University of Chicago, University of Maryland-College Park, University of Michigan, University of North Carolina-Chapel Hill, University of Pennsylvania, and Yale to name just a few.

## *Summer 2009 McNair Scholars and Program Staff*

**Standing (left to right): Felicia Sanders (Academic Coordinator), Arielle Riutort, Quortne Hutchings, Justin Meyer, Ilyas Abukar, Esteban Luna, Rafiquah Mustafaa, Teresa Tassotti (Program Director)**

**Sitting (left to right): Sopheavy Lim, Tatiana Gochez-Kerr, Dawn Gannon, Chelsie White, Alisa Shockley, Genevieve Miller-Brown, Judy Banker (Administrative Assistant)**

**Missing from photo: Marlena Freeman**

# ABOUT RONALD E. MCNAIR


Dr. Ronald Erwin McNair, the second African American to fly in space, was born on October 21, 1950, in Lake City, South Carolina. In 1971, he received a Bachelor of Science degree, magna cum laude, in physics from North Carolina A&T State University. He continued his education at the Massachusetts Institute of Technology (MIT) where, in 1976, he earned his Ph.D. in physics.

While at MIT, McNair performed some of the earliest development of chemical and high-pressure CO lasers. He went on to study laser physics at E'cole D'ete Theorique de Physique in Les Houches, France. He was well published and nationally known for his work in the field of laser physics through the Hughes Laboratory.

In 1978, McNair realized his dream of becoming an astronaut when he was selected from a pool of several thousand applicants to be included in the first class of thirty-five applicants for the space shuttle program. Ronald McNair and six other astronauts died on January 28, 1986 when the space shuttle *Challenger* exploded after launching from the Kennedy Space Center in Florida.

McNair was an accomplished saxophonist; held a sixth-degree, black belt in karate; and was the recipient of three honorary doctorates and a score of fellowships and commendations. He was married to the former Cheryl Moore and is the father of two children, Reginald Ervin and Joy Cheray. After his death, Congress approved funding to honor the memory of McNair by establishing the Ronald E. McNair Post-Baccalaureate Achievement Program, which became the sixth program funded under the TRIO Programs umbrella.

*"Historians, who will write about McNair, the man, will discover that there was much more to him than his scholastics achievements. Friends who knew him, say he walked humbly and never boasted about his achievements. They say his commitments were to God, his family and to the youths he encouraged to succeed.*"
(Ebony, May 1986)

## SPECIAL ACKNOWLEDGEMENTS


**PROGRAM AND EDITORIAL STAFF**

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Felicia Sanders, Academic Coordinator
Judy Banker, Staff Assistant

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Erwin Vogler

# McNair Alumni on the Move

*We congratulate our recent graduates and are very proud of their accomplishments. We also extend congratulations to those Penn State McNair alumni from either Penn State University (PSU) or Virginia State University (VSU) who have now earned their graduate degrees as well as those alumni currently enrolled in graduate studies.*

## At the graduate level…

| | |
|---|---|
| Mimi (Abel) Hughes (PSU 2002) | M.S., University of California-Los Angeles |
| | Ph.D., University of California-Los Angeles |
| Juan Abreu (PSU 2002) | J.D., Rutgers University |
| Taimarie Adams (PSU 2003) | J.D., Harvard University |
| Karla (James) Anderson (VSU 1999) | M.Ed., Central Michigan University |
| Heneryatta Ballah (PSU 2004) | M.A., Ohio State University |
| Omotayo Banjo (PSU 2004) | Ph.D., Penn State University |
| Angelo Berrios (PSU 2000) | M.Ed., Joseph's University |
| Aaron Brundage (PSU 1995) | M.S., Penn State University |
| | Ph.D., Purdue University |
| Jose Buitrago (PSU 1995) | M.L.A., Harvard University |
| Sherese Burnham (PSU 1999) | M.S., University of Central Florida |
| Sofia Cerda-Gonzalez (PSU 1999) | D.V.M., Cornell University |
| Andra Colbert (VSU 2005) | M.Ed., Johns Hopkins University |
| Trinaty Crosby (PSU 2005) | M.S.W., Howard University |
| Evelyn Cruz (VSU 1996) | M.S., University of Virginia |
| Natasha Deer (PSU 1995) | M.A., Florida State University |
| Alicia DeFrancesco (PSU 1997) | M.B.A., Babson College |
| Lurie Daniel (PSU 2000) | J.D., New York University |
| Jorge Delgado (PSU 2004) | M.S., Purdue University |
| Eve Dunbar (PSU 1998) | Ph.D., University of Texas-Austin |
| Carol Elias (VSU 1997) | M.Ed., Virginia State University |
| Mark Elwell (PSU 2002) | M.S., Cornell University |
| Natasha Faison-Njai (PSU 1999) | M.S., Penn State University, |
| | M.Ed., University of Michigan |
| Max Fontus (PSU 1999) | Ph.D., Indiana University-Bloomington |
| Tiana Garrett (VSU 2001) | Ph.D., University of North Carolina |
| Michael Godeny (PSU 2002) | Ph.D., University of Florida |
| Cristina Gonzalez (PSU 1999) | M.D., Albert Einstein Medical School |
| Sherie Graham (PSU 2002) | M.P.H., University of Michigan |
| Derek Gray (VSU 1998) | M.L.A., SUNY-Albany |
| | M.A., SUNY-Albany |
| Mark Harewood (VSU 2000) | M.A., Webster University |
| Janet Harris (PSU 1996) | M.Ed, Duquesne University |
| Angela Hess (PSU 1998) | Ph.D., University of Iowa |
| Priscilla Hockin-Brown (PSU 1996) | M.S., Michigan State University |
| | Ph.D., Rutgers University |
| Dustin Holloway (PSU 2002) | Ph.D., Boston University |
| Marissa (Graby) Hoover (PSU 2000) | M.S., Temple University |
| Meng He (PSU 2002) | M.S., American University |
| Jeffrey Himes (PSU 1997) | M.A., West Virginia University |
| Alisa Howze (PSU 1994) | Ph.D., Texas A&M University |
| Andrea Jones (VSU 1998) | M.A., Virginia State University |

| | |
|---|---|
| Michelle Jones-London (PSU 1996) | Ph.D., Penn State University |
| Leshawn Kee (VSU 1998) | M.A., Regents University |
| Haroon Kharem (PSU 1996) | Ph.D., Penn State University |
| Carrie (Hippchen) Kuhn (PSU 2001) | M.A., Stanford University |
| Judy Liu (PSU 1995) | M.S., University of California-Berkeley |
| | Ph.D., University of California-Berkeley |
| LaShawne Long-Myles (PSU 2001) | M.Ed., Xavier University |
| Lanik Lowry (PSU 2002) | M.B.A., University of Maryland-College Park |
| | M.A., University of Maryland-College Park |
| Charmayne Maddox (PSU 2004) | M.Ed., Penn State University |
| | M.Ed., Chestnut Hill College |
| Lourdes Marcano (PSU 1995) | M.B.A., University of Tennessee |
| Debra Marks (VSU 1996) | M.S., University of Virginia |
| Leanna Mellott (PSU 2000) | Ph.D., Ohio State University |
| Robert Miller (PSU 1999) | Ph.D., University of Kentucky |
| Bethany Molnar-Hindes (PSU 1998) | M.A., Northeastern University |
| Nicole Morbillo (PSU 1998) | D.P.T., New York University |
| Ndidi Moses (PSU 2000) | M.A., Penn State University, |
| | J.D., University of Connecticut |
| Rashid Njai (PSU 2000) | M.P.H., University of Michigan |
| | Ph.D., University of Michigan |
| Julio Ortiz (PSU 2002) | Ph.D., Penn State University |
| Robert Osmanski (PSU 1995) | M.S., Penn State University |
| Hui Ou (PSU 2005) | M.S., Cornell University |
| Mark Palumbo (PSU 2000) | M.S., Wright State University |
| | Ph.D., Wright State University |
| Tracie Parker (VSU 2003) | M.A., Ohio State University |
| Franche Pierre-Robinson (VSU 2002) | M.Ed., University of Illinois-Chicago |
| Kenya Ramey (VSU 2006) | M.A., Temple University |
| Caryn Rodgers (PSU 2000) | Ph.D., St. John's University |
| Lilliam Santiago-Quinones (PSU 1998) | M.Ed., Bowling Green State University |
| Thomas Shields (PSU 1998) | M.A., Penn State University |
| Christie Sidora (PSU 2000) | M.Ed., Duquesne University |
| Andrew Snauffer (PSU 1996) | M.S., Michigan Technical University |
| Melik Spain (VSU 1996) | M.S., Virginia Tech University |
| Anthony Spencer (PSU 1999) | Ph.D., Northwestern University |
| Kashra Taliaferro (PSU 2003) | M.Ed., University of Maryland-College Park |
| Constance Thompson (VSU 1996) | M.S., Cornell University |
| Shawyntee Vertilus (PSU 1998) | M.P.H./M.D., New York Medical College |
| Patrice White (VSU 2001) | M.A., University of Maryland-College Park |
| Kahlil Williams (PSU 2001) | M.A., University of Pennsylvania |
| | Ph.D., University of Pennsylvania |
| Romon Williams (VSU 1995) | M.S., Wake Forest University |
| Wendy Williamson (PSU 1995) | M.B.A., Penn State University |
| Michele Wisniewski (PSU 2004) | Pharm.D., Massachusetts College of Pharmacy (Pharmacy) |
| Kenya Wright (VSU 1997) | M.S., North Carolina State University |
| Robert Allen Young (PSU 2007) | M.Ed., University of Pittsburgh (Higher Education) |
| Felix Acon-Chen (PSU 2004) | M.S., Stevens Institute of Technology, now pursuing second masters in Space Systems Engineering at same institution |
| Michael Benitez (PSU 2001) | M.Ed., Penn State University, now pursuing Ph.D. in Educational Leadership at Iowa State University |

| | |
|---|---|
| Laurian Bowles (PSU 1999) | M.A., University of London, M.A., Temple University, now pursuing Ph.D. in Anthropology at same institution |
| Debbie Charles (PSU 001) | M.S., University of Maryland-College Park, now pursuing V.M.D. at Tuskegee University |
| Catherine Crawford (PSU 1996) | M.Ed., Central Michigan University, now pursuing graduate studies at Cappella University |
| Latia Eaton (VSU 2003) | M.S.W., University of Baltimore, now pursuing second masters at St. Mary's Seminary |
| Felecia Evans-Bowser (PSU 2002) | M.S., Texas Tech University, now pursuing Ph.D. in Meteorology at same institution |
| Antoinette Gomez (PSU 1994) | M.S., Clark-Atlanta University now pursuing Ph.D. at University of Denver |
| Maria Gutierrez-Jaskiewicz (PSU 2005) | M.A., University of California-Berkeley, now pursuing Ph.D. in Middle East Studies at Yale University |
| Atiya Harmon (PSU 2002) | M.S., University of Pennsylvania, now pursuing M.Ed. at Chestnut Hill College |
| Angel Miles (PSU 2003) | M.A., University of Maryland-College Park, now pursuing Ph.D. in Women's Studies at same institution |
| Zakia Posey (PSU 1999) | M.S., Michigan State University, now pursuing Ph.D. in Anthropology at same institution |
| Kristin Rauch (PSU 2004) | M.S., University of California-Davis, now pursuing Ph.D. in Anthropology at same institution |
| Cavin Robinson (PSU 2002) | M.A., DePaul University, now pursuing Ph.D. in Philosophy at same institution |
| Sassy Ross (PSU 2001) | M.F.A., New York University now pursuing Ph.D. in English at University of Utah |
| Steven Thompson (PSU 1997) | M.S., Indiana University-Purdue, now pursuing Ph.D. in Media Studies at Clemson University |
| Anthony Paul Trace (PSU 2004) | M.S., University of Virginia now pursuing Ph.D in Physical and Biological Sciences at same institution |

## At the undergraduate level …

Jacqueline Cauley (PSU) – B.A., May 2009
Penelope Chambers (PSU) – B.S. December 2008
Shanya Cordis (PSU) – B.A. May 2009
Damaris Fuster (PSU) – B.A. May 2009
Blake Garcia (PSU) – B.A. May 2009
Janay Jeter (PSU) – B.A. August 2009
Jennifer Mulcahy-Avery (PSU) – B.A. May 2009
Benjamin Ogrodnik (PSU) – B.A. August 2009
Patrick Reck (PSU) – B.A. August 2009
Marquita Stokes (PSU) – B.A. May 2009
Robert Vary (PSU) – B.S. May 2009
Tiffany Velez (PSU) – B.A. August 2009
Aimy Wissa (PSU) – B.S., December 2008

## On to graduate school in Fall 2009…

Jacqueline Cauley now pursuing graduate studies in Celtic Studies at Queen's University (Ireland)
Penelope Chambers now pursuing graduate studies in Economics at University of Paris (France)
Blake Garcia now pursuing graduate studies in Political Science at Texas A&M University
Jennifer Mulcahy-Avery now pursuing graduate studies in Clinical Psychology at Boston University
Benjamin Ogrodnik now pursuing graduate studies in English at Ohio State University
Robert Vary now pursuing graduate studies in Mathematics at University of Florida
Aimy Wissa now pursuing graduate studies in Aerospace Engineering at University of Maryland-College Park

## In graduate school as of Fall 2009…

Luis Agosto (PSU 2005) University of Pennsylvania (Microbiology)
Christopher Arlene (PSU 2004) Harvard University (Public Policy)
Saalim Carter (PSU 2007) University of Chicago (History)
Dipnil Chowdhury (PSU 2007) University of Pennsylvania (Systems Engineering)
Michael Collins (VSU 2005) Howard University (Medicine)
Latoya Currie (VSU 1999) Virginia Commonwealth University (Education)
Alana Curry (VSU 2007) Tuskegee University (Veterinary Medicine)
Jennifer Geacone-Cruz (PSU 2002) Bunka So-en Daigaku University (Fashion Design)
Oneximo Gonzalez (PSU 2007) University of Pittsburgh (Biomedical Engineering)
Kathy Goodson (VSU 2005) University of Maryland-College Park (Biochemistry)
Dennis Harney (PSU 1993) University of Pennsylvania (Governmental Administration)

Juliet Iwelumor (PSU 2006) Penn State University (Biobehavioral Health)
Robert Ksiazkiewcz (PSU 2007) University of Pittsburgh
Renee Killins (PSU 2007) Purdue University (Life Sciences)
Chong Mike Lee (PSU 2007) Penn State University (Molecular Biology)
Edward Mills (VSU 2003) University of Illinois at Urbana-Champaign (History)
Shartaya Mollett (PSU 2007) University of Pittsburgh (Social Work)
LaShauna Myers (PSU 2003) University of Pennsylvania (Higher Education)
Fawn Patchell (PSU 2007) Penn State University (Nutrition Sciences)
Anjana Patel (PSU 2008) Drexel University (Public Health)
McKenna Philpot-Bowden (VSU 2004) St. Joseph's University (Education)
Tiffany Polanco (PSU 2004) Rutgers University (Animal Science)
Natalie Ragland (PSU 2001) Ross University (Veterinary Medicine)
Sue Annie Rodriguez (PSU 2008) Arizona State University (Human Development & Family Studies

Armando Saliba (PSU 2003) University of Incarnate Word (Public Administration)
Adriana Segura (PSU 2006) Northwestern University (Medicine)
Kedesha Sibliss (VSU 2003) Howard University (Medicine)
Luisa Soaterna (VSU 2004) Virginia Commonwealth University (Health Administration)

Scott Test (PSU 2008) Clarion University (Library Sciences)
Katherine Wheatle (PSU 2008) Emory University (Public Health)
Daniel Zaccariello (PSU 2008) Rice University (Political Science)

# *Re/inventing Africa: Chinua Achebe,* No Longer at Ease*, and the Question of Representing Cultural Others*

**Ilyas Omar Abukar, McNair Scholar**
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**The Pennsylvania State University**

*Abstract*

The Western novel, practicing imperialist Africanism, has historically *othered* Africans as savages. Chinua Achebe, a Nigerian writer, appropriated the colonizing West's language and narrative to present the colonial encounter from an African perspective. Interestingly enough, both African and non-African scholars believe that Achebe's novels inadvertently reproduced the essentialism that reduced Africa into a single complete discourse—a total invention of African literary culture. By analyzing one of Achebe's most important novels, *No Longer at Ease*, this study argues that Achebe's work presents a nuanced picture of both European and Nigerians as cultural others through the protagonist's lived experience in Lagos after returning from London.

## Introduction

Chinua Achebe's body of work has been credited as the emergence of an African fiction that goes beyond the Eurocentric discourses about African cultures. Achebe's literature, starting from *Things Fall Apart*, has been essentialized as the beginning of authentic African literature—the colony speaking back to a Metropolis, which has often indiscriminately caricaturized it as a cultural Other. This study explores the representations of cultural Others in Achebe's second novel *No Longer at Ease*. Although a work of fiction, this text performs the cultural work of informing on its society: in this case, colonial Nigeria of the twentieth century. My research is driven by a central question: why does the protagonist Obi Okonkwo—a Nigerian finally *given* opportunity and access to a government position, since imperial policy usually forbids such mobility for the colonized, ultimately abuse his power and succumb to corruption, despite his lofty Western ingrained idealism? Is it as Okonkwo's European employer, Mr. Green, claims, that, "The African is corrupt through and through" (3). By placing this narrative in a post-colonial framework, this study will move to disapprove that Orientalist, or European Africanist, claim and uncover the novel's true argument. There are certain explicit and implicit reasons and structures of power set firmly in place in the colonial setting designed to hinder Okonkwo's—and by the extension the African's—agency in colonial space. For its part, the novel registers the clash of ideologies between the indigenous culture and the imperial culture; and to Achebe's credit, the novel depicts from an African perspective the internal struggle of the indigenous

culture and identity to survive under the imposing and usurping weight of colonial modernization and education.

## Chinua Achebe and the European Imperialism

Europe's imperialistic intervention in Africa is an interesting study in human adaptation. This tragic event had the effect of permanently reshaping the face of the African continent in terms of religion, ideology, economy, politics, and society. In a sense, it has actively brought onto this Earth a new race of African peoples. The colonial encounter, and its experience by black Africans up until independence from European powers, is nothing short of an internal struggle for cultural identity and national recognition as a resistance to European domination. Along with the destruction of the previous regionalism and tribalism of pre-colonial Africa, Colonialism introduced new unified and centralized—albeit under imperial authority—nations. Indigenous peoples who were once separated by language, culture, and politics found themselves, by virtue of their proximity towards each other, carved into "nations" under a mutual distant and foreign ruler. The establishment of the colonial nation forced small autonomous groups and villages to break away from their communities and migrate into colonial cities in search of work and/or political voice in a world that is being directed by intruding Europeans. And within this encounter between village and city, the indigenous people are caught up in the clash between the ideologies of the old culture and the new imposed and accepted European doctrines.

Within the pages of *Orientalism*, Edward W. Said posits the theory of the Other to examine the complex mechanism and ideology behind imperialism—more specifically, the conversation between the West and the non-West during and after Europe's aggressive campaign for world dominance. Although he is not the first theoretician to utilize this theory, Said aptly applies it to the colonized world.[1] Imperialism, in its barest form, is a system of power encompassing the political, social, and cultural relationships between two forces: colonizer and colonized. Within this system these two forces occupy uneven spaces, imperialism's value system places—to use common post-colonial terminology— the dominant culture, the colonizing imperialist, in the center and the colonized in the periphery.[2] Said observes that imperialism understands the non-Western world as only a series of static discourses of its making, collected through a tradition of literature, travelogues, poetry, and various encounters in conquest. Through the practice of Orientalism, the study of the Orient the West has justified its imperialism as an ideological imperative to raise the lesser races that depend on it for direction and purpose, 'In a quite constant way, Orientalism depends for its strategy on the flexible positional superiority, which puts the Westerner in a whole series of possible relationships with the Orient without ever losing him the upper relative hand." [3] The non-West exists only in as much as it affects the West; it is silent, inactive, and passively depends on the center for its culture and

[1] The concept of the Other originated out of German philosopher Georg Wilhelm Frederich Hegel's discussion of the Master-Slave dialect in his *Phenomenology of Spirit*.

[2] Ashcroft, Bill, Gareth Grifiths, and Helen Tiffin. The Empire Writes Back: Theory and Practice in Post-colonial Literatures. 2nd ed. London and New York: Routledge, 2002. This structure facilitates a clear division between the colonizing Metropolis as the subject and its territories as the objectified Other. Imperialistic discourse constructs the West, the Metropolis, as the center of any and everything, science, politics, literature, etc, concerned with the advancement of humanity.

[3] In his work *Orientalism*, p. 3.Edward W. Said specifically discusses the West's relationship with the Orient. Our argument observes that the West has also historically observed the same relationship with Africa—practicing an Africanism.

administration. This perspective indicates imperialism's modus operandi of indirect rule. Orientalism expresses the European tradition—literary or otherwise—of understanding itself through its Oriental or African Other.

The West, of course, has a rich literary tradition that extols European culture. The English department and the imposed teaching of English in non-Western educational institutions signify Western culture's ethnocentrism. Every Western and non-Western student of English and literature witnesses the great Western classics in their education; in that encounter, he meets the West's constructed cultural Other. English literature, especially the English novel, is intimately and uniquely imperialistic, despite its pretentions. As Toni Morrison reminds us the African Other, despite being marginalized, has held a steady and significant presence in Western literature.[4] This presence has served as a prop set up against Europeaness in order to define it. The literary classics from which the West derives its cultural identity have been constructed at the expense of the non-Western world. The imperialistic West has reduced the non-West to an object that accentuates the nuances of the Western subject. Unlike African literature which performs a cultural work of combating this ideology, Western culture unwittingly embraces its ideology of imperialism. Western literature is assumed by its readership to be "aloof from [imperialism], today's scholar and critic is accustomed to accept it without noticing their imperial attitudes and references along with their authoritative centrality."[5] However, imperialism makes up the fabric of Western education, literature, and culture. Said acknowledges that this aspect is so all-consuming that the Westerner or Western educated scholar often blindly accepts and perpetuates its political agenda. Said's observation strikes at the heart of our argument. Our work concerns the moment, as witnessed by the emergence of the African novel, in which the African Other ceased to be silent, to speak back to the West. This study examines the effectiveness of that initial subaltern voice. For that purpose, this paper will look at the author who has been credited as the founder of the African novel: Chinua Achebe.

Albert Chinualomogu Achebe was born into colonial Ogidi, Nigeria in 1930. This simple fact is important because it is not that simple at all; in that, Achebe was born into colonialism. Raised in an Igbo Christian family, he was the product of a mission school upbringing and received his college education in English literature at the University College at Ibadan, Nigeria. As a colonial subject, Achebe received an education in the Western tradition and from a Western perspective. Upon discovering the African Other and the negatively charged discourse around Africa embedded in his studies, Achebe quickly denounced the European assertions of African inferiority by Africanizing his name to Chinua Achebe—a clear and decisive attempt to reinvent himself.

What spurred such a cultural awakening from an otherwise docile colonial subject? For Achebe, it was the encounter with the African Other in his literary education —an invention far removed from Achebe's own experiences as an African—that inspired him to acknowledge Nigeria's cultural difference from England. The novelist has admitted to feeling compelled to write about colonial Nigeria because he could not see himself or his culture in the narrow

[4] Toni Morrison's *Playing in the Dark: Whiteness and the Literary Imagination* discusses the marginal role African Americans have historically been assigned in American literature. The author acknowledges how the Othering of Blacks as props in this ethnocentric literary culture discloses the "ways that Americans choose to talk about themselves through and within a sometimes allegorical, sometimes metaphorical, but always choked representation of an Africanist presence" (17).

[5] Edward W. Said. Culture and Imperialism. New York: Vintage 1994, p. 239.

European depiction of his continent. The colonized native was certainly there but he was not recognizable to Achebe as, "one of the things that set [him] thinking was Joyce Cary's novel set in Nigeria, *Mr. Johnson*,..and it was clear that it was a most superficial picture of—not only of the country, but even of the Nigerian character, and so [he] thought if this was famous, then perhaps someone ought to try and look at this from the inside" (4). From the start of his career, Achebe admits to having been aware of an "inside" and an implied outside, that representation can be subjective, arbitrary, and powerful. He was not comfortable with the representation of Nigerians and thus moved to change it, to no longer be spoken about but to accurately speak of his culture. For this effort, Achebe has been lauded by scholars from both empire and Metropolis.

The publication of his novel *Things Fall Apart* in 1958 was hailed as the birth of the African novel. Set at the onset of European colonialism, the work aims to revise the colonial encounter and present it from the perspective of the colonized. Simon Gikandi states that Achebe invented African culture in literature by the simple act of rescuing it from the clutches of the European imagination: "I would argue then, that this confidence is precisely what enabled Achebe to shift the idea of Africa from romance and nostalgia, from European primitivism, and from rhetoric of lack, to an affirmative culture" (8). Gikandi is adamant that this particular author has given rich substance to what was once an empty pool of outsider assumptions. Nevertheless this is where Achebe becomes problematic for many scholars like Ngugi wa Thiong'o and Ode Ogede who—like Frantz Fanon—believe that African, or colonized, literature must be subversive.[6] The awakening of the consciousness is important for every colonized writer and his realization of difference is a key feature of the literature produced, the true effectiveness of his work is measured by how he approaches and treats that difference. Achebe must be commended for stepping up to the challenge of the colonial encounter by treating it in his works. Like any other effective colonial writer, he does not retreat to the romanticism of pre-colonialism or the realm of religion and spirituality to hide from it.

His work primarily concerns the issue of imperialism with the understanding that oppressed groups do not operate in a vacuum, they exist within a greater framework of Capitalism, imperialism, racism, or whatever hegemonic power is thrust upon them. They are connected to the machinations of the exploiter. A strong Nationalist writer—as Achebe has been anointed—must consider these implications to better represent the lives of such groups. Richard Wright's "Blueprint for Negro Writing" in discussing the subaltern writer, claims, "that a Negro [or subaltern] writer must create in his readers' mind a relationship between a Negro woman hoeing cotton in the South and the men who toll in swivel chairs in Wall Street and take the fruits of her toil."[7] There is no doubt that Achebe makes this connection between Nigeria and England. The novelist's contribution to post-colonial thought is undeniable; his voice was the first African voice to speak against England's literary monopoly on representation.

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[6] Frantz Fanon's *The Wretched of the Earth*, 1961, argued that the colonized must completely break away from the colonizer—not only politically but also ideologically. The author argued that the colonized, after the decimation of the indigenous culture, must craft a new culture around the struggle for independence. Ngugi wa Thiong'o in *Decolonising the Mind*, 1986, argues that African writers must write in their own indigenous African language in order to preserve African cultures and address an African audience as well. He faults Achebe for writing in English. Ode Ogede in *Achebe and the Politics of Representation*, 2001, faults Achebe for wiring in the European literary convention of tragedy and thus failing to break away from European literary conventions.

[7] *The New Negro: Readings on Race, Representation, and African American Culture, 1892-1938*: p. 273.

However Achebe's response was merely a reaction to English misrepresentation of Africa. His work never sought to create an alternative fiction to Eurocentric discourse about African culture; it only promoted a different perspective. Nevertheless. Gikandi, amongst others, has elevated Achebe's work as the quintessential image of colonial Africa. African writers and critics, alongside Europeans, have begun to practice a sort of essentialism in which they encourage readers to rely on Achebe's fiction as the preferred image of Africa. Whilst literature can offer us in-depth insight into the human experience, it has its limitation. After all, literature is constructed representation which begs two important questions: who is representing and who is being represented?

Europeans consistently differentiated Africans as savages in works such as James Conrad's *Heart of Darkness*. With the entrance of Achebe, a new perspective emerged: that of Western educated Africans. But by the simple virtue of their education in the colonial context, these African intellectuals are locked into a class of their own. Although their effort to accurately represent Africa is appreciated, it falls short as their experiences drastically differ from the rest of the population. Their attempt to repudiate the West's imperialistic practices is even more complicated by their own adopted Western education and philosophies. As Wright aptly demonstrates, "There are times when [a subaltern writer] may stand too close and the result is a blurred vision" (272). This study is not meant to question the authenticity of Achebe's Africaness, however, it is meant to question his works' treatment of Africaness. The evidence indicates that Achebe's representation of Africa is not subversive. It is what will be referred to in this study as corrective; the novelist's vision is "blurred" and compromised by his social location as a member of an educated elite. The argument goes back to Said's concept of Orientalism and involves the extent to which Achebe challenges that system's "authoritative centrality." By analyzing Achebe's second novel, *No Longer at* Ease, we will prove that Achebe's work is more interested in correcting the misconceptions about Africa than subverting imperialist ideology.

But first, the significance of the novel as a form of representation must be approached. The novel, especially the British canonical novel, does not exist in a vacuum. Instead the novel informs us that there is indeed a relationship between British "culture and empire."[8] Thus it can be concluded that Eurocentric discourses about Africa stemmed out of the relative hegemony that the West enjoyed over the non-West; in that, those discourses were reinforced by the reality and realization of Western imperialism.[9] Nevertheless it is that same tradition that introduced Achebe to literature. Due to his colonial education, he came into his identity as writer by way of the Western canon. The fact that he was able to recognize its Western bias is remarkable. But as the opening epigraph of *No Longer at Ease,* T.S. Eliot's "The Journey of the Magi" attests, Achebe is reluctant to break away from Western tradition. After all this tradition has trained him as a writer; it equipped him with the tools and knowledge to express his identity. The father of the African novel is under the impression that is not the Western tradition of writing that is at fault but how it has been used by its practitioners. Despite the fact that the Western literary tradition is intrinsically imperialistic, Achebe seeks to intercept and redeem this tradition. From his deliberate choice of Elliot's poem, we can infer that Achebe is not claiming decent from

[8] Edward W. Said. *Culture and Imperialism*; p. 64.

[9] For purpose of this paper, I consulted *The Empire Writes Back* by Bill Ashcroft, Gareth Griffiths, and Helen Tiffin to understand the concept of cultural hegemony. If you want a deeper and full understanding analysis, you should read Antonio Gramsci who originated the concept. See Selections from the Prison Notebooks. London: Lawrence and Wishart, 1971

African literary tradition but in fact wants to present himself, according to Lloyd W. Brown, as a product of Western tradition "in order to reverse the white man's exclusivist definitions of history and culture" (25). Achebe affirms that Elliot belongs to Africa as much as the poet does to Europe. The novelist has also utilized this same trend in his earlier work *Things Fall Apart* whose epigraph features Yeats's "The Second Coming: "Namely in evoking Yeast's themes, Achebe implies that the sense of history and tradition, the burdens of cultural decay, and rebirth, have all been the African's lot as well as the Westerner's.[10]

Implicit in Achebe's inclusive declaration are two very problematic assumptions; firstly, that Europe's racist characterization of Africans is due to the fact that no African, before Achebe, has mastered the art of the colonizer's language sufficiently enough to correct European misconception; and secondly, that Africans have no literary tradition of their own and must be absorbed into the European tradition—that the only valid African literature is born out of Western intervention. The 'cultural decay and rebirth" Brown references alludes to the subject matter of Elliot's poem to which he connects *No Longer at Ease*. Elliot's "The Journey of the Magi" with its depiction of the birth of the Christ child is an apocalyptic text about the death of "the old dispensation" and, as observed by Brown, the introduction of a new morality. In this context, this new morality can be interpreted as imperialism and the cultural intervention of the West. The poem proves significant because it points to *No Longer at Ease*'s tone of acquiesce to Western ideology. The novelist's attempt at realism does not disavow Western literary history. Rather it embraces it through Elliot's poem. Achebe's mission in that light is then obvious—the novelist is concerning himself with the performance of the corrective work necessary to prove that the African is not Conrad's savage or Cary's *Mister Johnson*.

If his work is merely corrective, doesn't Achebe then run the risk of regurgitating Europe's age old Eurocentric discourses about Africa? Achebe once quipped that African literature is not only for entertainment but serves the cultural work of documenting the lives of colonial Africans.[11] Thus he described his work to Kalu Ogbaa as a sort of archive housing the lives of African peoples, professing that "if someone is in search of information, or knowledge or enlightenment about the total life of these people—the Igbo people—I think my novels would be a good source" (64). In his poor choice of words Achebe reduces "the Igbo people" to a discourse and positions himself as the authority on this people. As we have learned from Said, knowledge and information are the tools in which imperialism uses to control colonized groups.[12] The idea is that the more information is collected about a certain group, the easier it is to regulate them. Othering excludes complexity and attempts to understand everything outside of the Subject as singularly and simply as possible. And by pointing to his text as "the total life of these people" Achebe is trapping the Igbo people in one complete static essentialist discourse.

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[10] Lloyd W. Brown. "Cultural Norms and Modes of Perception in Achebe's Fiction:" p.24.

[11] This is from a 1980 interview that Kalu Ogbaa conducted with Chinua Achebe. The text of the interview can be found in *Conversations with Chinua Achebe*

[12] This practice has historical precedence in British rule of Nigeria. After the Women's War of 1929 in which Nigerians mounted an intimidating protest against increased taxation, Britain schemed to make its taxation through indirect rule seem a little less foreign to its empire. The crown hired various anthropologists to study the history and culture of the Nigerian masses. Around the information these anthropologists provided, Britain restructured its colonial administration by taxing individuals through a clan system with the hope that this move would make taxation appear more legitimate to the masses. For Britain, its Nigerian colony was encompassed in what little information these anthropologist could gather on a complex culture. Suffice to say, this system soon collapsed since members of clans in Nigerian society are spread out and do not necessarily occupy certain closed regions. This information is available in David Pratten's historical account of colonial Nigeria work *The Man-Leopard Murders*

He is proposing that the Igbo people are and can never be anything but as they are represented in *Things Fall Apart* or *No Longer at Eas*e since they are now being represented by a fellow Nigerian who has taken the reins over from the outside European and his misrepresentations.

However the politics of representation are not that straightforward and are further complicated by the enterprise of colonialism. We have already established that Achebe, due to his education and Christian background, is not an author speaking from inside the Nigerian masses. His eye, although Nigerian, is still one step removed because to his class. His representation of Nigeria, to an extent, is also from an outside. In the colonial context, the very few who are educated are the ones whose voices logically assert themselves in literature, politics, and economics. Ironically their experiences differ immensely from the masses. This discrepancy of experience between these two indigenous groups has been a long standing issue in post colonial thought which has marked Achebe's work as controversial. Ngugi wa Thiong'o and other theoreticians have criticized Achebe extensively for what they perceive as ambivalence to his issue. However their criticism is misplaced because they fail to take into account the mechanism of representation in the colonial context. Colonial writers like Achebe who are born into imperialism have no choice but to appropriate the language and literary conventions of the colonizing culture in which they receive their education.

According to Said's *Culture and Imperialism*, appropriation is a part of indigenous resistance ideology. For instance, Said discusses Ngugi wa Thiongo's appropriation of the Conrad's river from *Heart of Darkness* in the Kenyan writer's novel *The River in Between*. When we evaluate Achebe's techniques, we must take into consideration that Achebe is a colonial subject, and his appropriation of the colonizing West's forms of expression are necessary. Achebe can no more disown this fact than disown his own heritage as a Nigerian—a continuum of tradition that has been disturbed by colonialism. For him to pursue any forms other than those inherited from colonialism would be dishonest. Ultimately pundits cannot argue that the author forsakes his own culture for another because English has become an integral part of Igbo and other indigenous cultures tied up in Nigerian colonial legacy. But in order to understand this culture of appropriation, we must go back to the nature of what is being appropriating—the novel. This inquiry points why Achebe's work, and by extension third-world literature, must be subversive. Isn't it enough for Chinua Achebe to simply, as he claims, document "the total way of life" of his people?

The answer is no. Literature in the third-word is not simply art, but rather has a goal. Achebe's work cannot be disparaged for appropriating certain features. However it should be noted that the novelist gravely overlooks the role of third-world literature as what Frederic Jameson has called "national allegories."[13] Achebe's work does not recognize Jameson's assertion that, "Third-world text, even those which are seemingly private…necessarily project a political dimension in the form of a national allegory (69). Third-world literature is, especially the novel, allegorical in that it inform on the culture and identity of the nation. Thus not only is the content of the novel significant, the sociohistoric context in which the third world writer engages the novel is also be taken into consideration. As we've discussed above, the novel is not only a western form of representation but is also intrinsically bound to the culture that produces it. In the hands of the Western novelist, it manifested imperialist ideology. However when

[13] Frederic Jameson, "Third-World Literature ion the Era of Multinational Capitalism:" p.69. Jameson's view is also shared by Frantz Fanon, *The Wretched of the Earth*, and Ngugi wa Thiong'o, *Decolonising the Mind*.

approaching the novel, a third-world writers like Achebe must be careful as to how he structures his narrative.

As a third-world writer, Achebe effectively avoids the trap of nativism: the romanticizing of the pre-colonial era. At the same time, he proceeds cautiously against the extreme trap of assuming that the indigenous culture has been completely eviscerated by colonialism. Unfortunately, the novelist does not make much room for Fanon's argument that the culture of the ex-colonial or colonial state is neither in the past nor in the West.[14] This new culture which rests at the indigenous struggle for physical and ideological independence from the colonizer is the third-world novel's national allegory. However, *No Longer at Ease's* inability to engage Fanon prescription marks its lack of a subversive agenda; Achebe's text leans more towards ethnography than national allegory.

Since Achebe's objective asserts the African's worth and reverses the discourse of the West's "civilizing mission," the author presents the negative effects colonial indoctrination has brought upon Nigeria. Igbo culture, especially in the pre-colonial era, is founded on deference to elders.[15] However, David Pratten has keenly observed that colonialism, in its bid to establish indirect rule, undermined this system. With the advent of Western education and Christianity, indirect rule's success and overhaul of the social structure is evident in the younger generation's skeptical attitudes about the chieftaincy and the authority of their elders. Achebe himself recognized the difference between the pre-colonial attitudes towards elders and the new individualistic tendencies imported from the West, and in his own words championed the African model: "Respect is not only valuable to you [the individual], it's also valuable to old people for they are senior members of the society."[16] From Pratten's work, we deduce that during colonialism in Nigeria there was a power struggle between elders and the young educated youth. The elders advocated the traditional way of life as English doctrine undermined their authority. The youths—disillusioned with the lack social mobility of tradition and attracted to the individualism glorified the missionary schools and then abroad—were dissatisfied with the authority of their less educated elders. Nigerian youths thus initiated and formed unions in which they usurped the power of the chiefs and exercised political authority over their domain. In the midst of colonial transition, Nigeria witnessed the emergence of various new cultural identities.

## *No Longer at Ease*

*No Longer at Ease* dramatizes the cultural Othering colonialism has produced in Nigeria. Achebe relates the anxiety caused by English presence in Africa. The native in Achebe's narrative is accosted by Englishness in daily life—rendering him incredibly aware of his position as an objectified Other. Thus the Igbo sees himself in an unequal relationship with the English hegemony that threatens his cultural identity. Since the English are in charge, it becomes painfully obvious that "greatness has changed its tune. Titles are no longer great, neither are

[14] Frantz Fanon, *The Wretched of the Earth*, p.167: This is this new culture in which the colonized native must bind his novel. He must produce works that emphasize, reiterate, and build a new cultural identity around the struggle for liberation. In this way, a fusion of the pre-colonial cultural and what is imported from the colonizer's presence is possible—a new identity and culture is possible. Fanon's proposal safeguards

[15] From David Pratten's *The Man-Leopard Murders*: The structure of Igbo society is composed of associations based on age with elders at the top of the chain. The older an individual becomes, the more respect and power he/she garners. In the pre-colonial era chiefs and headsmen, descended from certain lineages, were directly in command of villages.

[16] *Conversations with Chinua Achebe*. "An Interview with Chinua Achebe" by Kalu Ogbaa, p.70.

barns or large numbers of wives and children. Greatness is now in the things of the white man. And so we too have changed our tune" (62). This marks the change in aesthetic that colonialism engendered in Africa. Achebe recognizes that there are two worlds: the native world and that of "the white man." Unlike the English who operate from the superior position of hegemony, Achebe recognizes that the Igbo individual must navigate between two spheres in order to survive in his own society. This novel details how Africans navigated the colonial space while simultaneously conscious of the European cultural other.

The various issues of personal and cultural identity that indigenous people must contend with under colonial rule ground Chinua Achebe's *No Longer at Ease*. Africa's best known author and moralist explores the colonial encounter from the black African perspective. Set in colonial Nigeria at the cusp of independence the narrative relays the rise and fall of protagonist Obi Okonkwo: an Igbo villager who through a community scholarship, by his village of Umuofia, is sent to England to attain—the only hope of advancement in the colony—a European education. Upon his return, he settles into a senior government post which he eventually loses to corruption i.e. acceptance of bribery. In Obi Okonkwo, a Western educated African with strong ties to village communal life, the Nigerian struggle to reconcile two worlds in opposition is present. The protagonist occupies a space outside of those worlds as evidenced by the conflict between his Igbo traditions and the Western "book" sensibilities that blind him to the realities of colonial politics. And through Obi's interaction with his Nigerian colonial environment, one can excavate the concept of self in relation to community. How is Obi hindered or helped by allegiance to his education. Does a black African, despite social advancement, have any real agency in a colonial setting? These are all important inquiries that can be answered by analyzing the central question of Achebe's work: why does Obi, a black African given the same education thus opportunities and office as a European, fail and succumb to corruption?

We can locate the social tension between African and English cultural others in "Obi's theory that the public service of Nigeria would remain corrupt until the old Africans at the top were replaced by young men from the universities" (44). This evidence helps us locate Obi in the young educated elites of historical colonial Nigeria. What haunts Obi throughout the text is this fear and suspicion of this old African that he must, by virtue of his education, replace and succeed. To him this old African is the reason behind Nigeria's corruption—a figure that can be redeemed through education. Young Obi Okonkwo, entering the narrative as an idealist who has been to the land of the white men, reaped its benefits, and now has returned to benefit Nigeria, has a limited view of his own people and the issues that plague them. Within the context of the work, the topic of Nigeria's progress is a major issue. The initial question the novel raises is whether Nigerians are ready for self-determination. Obi's answer is of course in the affirmative but only through Western education; Nigeria will prosper once the uneducated Africans are removed from office.

Obi's theory arises out of a need to explain the prevalence of bribery in the Nigerian body politic. The biggest problem in the country—and Obi's primary concern—is bribery. Because of his Western university education in the Metropolis, Obi is unaware of the nature of life for the average person in Nigeria. He exudes a self-righteousness which confuses fact with invention. The protagonist understands bribery not as a agency for disenfranchised Nigerians but as a cultural proclivity. At Obi's homecoming reception, the Vice president of the Igbo union offers to bribe a government official for Obi "by seeing some of the men beforehand" (38). in order to

secure a job for him. Later the reader encounters Elise Mark: a young woman so desperate that she offers up her body in exchange for a federal scholarship.[17] Achebe communicates to his reader that bribery has become a tool for natives to attain unmet social needs—a proactive way to get things done. Hence bribery can be seen as a form of agency in an otherwise uncertain era.

In order to represent Obi Okonkwo as an outsider to his own culture and better suggest his ignorance of Igbo society, Achebe juxtaposes Obi with the Eurocentric invention of the uneducated, backward African. The protagonist sees his education abroad as the saving grace that spares him from the disgraceful state of bribery and corruption. Obi's concept of the Old African is the same literary trope that Conrad and Cary, amongst countless English authors, have used to other Africans as savages. The author appropriates this concept in his narrative in order to dispel it as a myth. As Obi internalizes the Western discourse of the African as savage, Achebe stages him as a cultural Other to both the English and non-Western educated Igbos. Obi contemptuously attributes the corruption of the state to the overwhelming lack of education in Nigeria; he is repulsed by bribery because that is something only the uneducated savage deals in. Obi groans: "To [the uneducated] the bribe is natural" (23). When his companion points out that "the Land Officer jailed last year [for bribery]…is straight from University, Obi dismisses that fact and in exchange offers up a cultural Igbo proverb that in his mind justifies bribery (23). The protagonist misguidedly but successfully argues to his companion that bribery is inherent in the culture of the old uneducated Igbos. Obi's passion signifies his adopted English tendency to reject his fellow Africans based on narrow assumptions. In Obi Okonkwo, Achebe realizes Frantz Fanon's petty bourgeois intellectual who, detesting the traditional culture, asserts a paternalistic control over the rest of what he perceives as the intellectually lesser population.

The intellectual elite's paternalism can be explained by the harsh experience of colonialism in which indigenous people must ban together against uncertain enemy. This is where cultural Othering as a product of chauvinism and exclusivism in the colonial state takes root; where we can understand the need for associations like the Umuofia Progressive Union as resistance mechanisms. This reactive formation of unions against the uncertainty of colonialism portends the way in which colonialism forces itself on indigenous groups. To understand bribery as agency for colonized peoples we must first recognize that in the colonial context there is a disconnection between the colonized population and the colonial administration simply referred to in Achebe's text as "Government." This disconnection stems out of the discrepant experiences of colonialism that are witnessed by the colonizer and the colonized. The colonizing force automatically homogenizes the area that it colonizes as a dependent state. If we look to Anderson's theory, we can view the colonial state as an "imagined community" insofar as it is only real, complete, and intact, in the mind of the imperialist. However the colonized—of per se Nigeria—do not recognize it as such. While acknowledging that all the neighborhood villages are under the common rule of a foreigner, each village keeps to itself and attempts to continue with its pre-colonial way of life. To them, the idea of a national administering government is an extrinsic force gradually encroaching upon their village life. There is a lack of communication between the people who cannot imagine themselves as a nation and the colonial administration that neither understands nor cares for their interest. Achebe emphasizes this native ambivalence and ignorance to the machinations of the invading colonial administration in Obi's memories of village childhood. It becomes apparent from Obi recollection that the village is completely cut-

[17] *No Longer at Ease*, p. 102-108.

off from the rest of the world: the only source of information arriving through the sensationalized stories of soldiers. FOR their connection to the outside world and affiliation with the world of colonial administration these soldiers are revered and mystified: "It was said that if you touched a soldier, Government would deal with you" (15). To the villagers, Government is a specter haunting the village—something everyone knows exists but cannot fathom. The state from the colonized perspective is an imagined community.

But the village of life of pre-colonial Nigeria operated as a real community in which, due to its relative small size, individuals who were familiar with each other on a daily basis practiced the same communal way of life. The villagers initially did not recognize or even speak the language of their so-called government. Nevertheless they were well versed in the laws, customs, and culture of the village. Lloyd W. Brown in his study of post-colonial fiction including Achebe's *No Longer at Ease* surmises that only the morality and ethics of the village are real to the colonized. Their indifference to Government and the regulation of the state is due to the fact that—since it was created by the foreign colonizer—they have 'been accustomed to think of a central authority in terms of powerful, alien exploiters" (33). Historically, this silent space between the indigenous masses and the colonial administration is where the younger educated elite of colonial Nigeria—eager to usurp power from the "Old African" chiefs—consolidated their power as intermediaries. However since these unions, fictionalized as the Umuofia Progressive Union in Achebe's fiction, developed along ethnic lines, they can also be argued as a form of agency—akin to bribery. These unions were created to look out for the welfare and progress of their constituent ethnic groups. Practicing an exclusivism that rejected non-Western educated Africans, these unions evolved into national political parties. With Nigeria's modernity in mind, these unions rebuked traditional culture, seeing themselves as the leaders and future of Nigeria.

Although he criticizes this class's preoccupation with Western culture in his construction of Obi Okonkwo, Achebe never rejects it in his dramatization of the fictional Umoufia Progressive Union. Achebe fails to differentiate between the Nigerian masses and this educated elite class. In his narrative, Obi's elitist class of the educated few represents the culture and the voice of the Igbo masses as a whole: an assumption that is problematic since this class historically upheld and benefited from colonialism. Pratten's testimony provides insight into the historical rise of unions such as the narrative's Umuofia Progressive Union and more importantly Achebe's bias construction of certain elements.

The novelist does not accurately represent the conflict between traditional customs and modernity. For example, the representation of Christianity: Achebe simplifies the introduction of this religion into Igbo culture. In the context of the novel, Isaac Okonkwo converts for personal reasons—his disillusionment with his father's customs as it led to the murder of his foster brother. In the logic of Achebe's narrative, Isaac's conversion puts him at odds with his fellow non -Christian Igbos who he refers to as heathens. They in return see him as blinded by the white man's mystification.[18] Achebe presents Christianity as a counter-productive dividing force in Igbo society. The author accuses Christianity of destroying the communal lifestyle that has

[18] Isaac Okonkwo clashes with his fellow Igbos at various times about religious practice. In one instance: Ogbuefi Odogwu, a village elder, wants to eat a kola—as per tradition—to celebrate Obi's return home in Isaac's house. However Isaac quickly surmises this to be a heathen sacrifice to an idol and is enraged that such an act should be performed in his Christian home. P. 59.

traditionally banded Igbos in kinship. From the text it can be deduced that before Christianity it was common practice for an Igbo to feed any child of the village as his own. However in the Christian era when, "a neighbor [offers] a piece of yam to Obi…He shook his head like his older and wiser sisters, and then said: 'We don't eat heathen food" (67). Christianity dramatically altered Igbo society but Achebe's view of it is a bit too presumptuous. In the colonial encounter many elements—amongst them religion—are appropriated and reinvented by the people who take them on.[19] Although imported from the colonizing culture Christianity was not simply an intruding evil that turned people against each other.

According to Pratten, the conversion ordeal in colonial Nigeria was a result of social unrest and break between the elder generation and the Nigerian youth. Pre-colonial Nigerian social structure consisted of "societies" in which individuals were initiated into certain societies at certain stages of their lives. The society of elders constituted a collective that exercised judicial and executive power in village governance. This society also had an economic value as it required the payment of fees to join--a feature which cemented and added to the wealth of the chieftaincy. However the younger generation, along with the marginalized of society such as the mothers of twins, refused to join this society and opted for available alternative of Christianity instead of paying the heavy fees associated with initiation; "Colonialism and Christianity had created a rift between youth and elders and between varied bases of political authority" (Pratten 93). Christianity provided an alternative model for Igbos who were dissatisfied with the old traditions and customs.

How is this connected to Achebe's Umoufia Progressive Union (UPU)? Achebe is too sympathetic in his construction of the role unions like the UPU played in the colony. Achebe wants his readers to see this union as the voice and representative of the Nigerian masses. After all they exist within the novel as one communal and democratic entity espousing the proverbs and thus "traditions" of Nigeria. They take on the name of their village and are depicted in promoting the well-being of their community by promoting scholarships, "by taxing themselves mercilessly" in the absence and in spite of the Government (7). They also comfort Obi in his grief and come together to pay his lawyer fees out of duty to kinship. However to view the novel as a big tug of war between the UPU and demoralizing English influence with Obi in the middle is a grave mistake. The one trap some readers of the novel crawl into is associating Fanon's victimized masses with the UPU. To romanticize Obi's break with the UP as proof of Obi's bourgeois proclivities and Western individualism is too simplistic. Even though they shamelessly spew the proverbs of the people, the UPU is not by any means representative of the Nigerian masses.

Historically groups such as the UPU surfaced as urbanization increased along with the number of educated Christianized youths as the power of the chieftaincy declined. These societies were instituted by a new indigenous class freed from the rigid indigenous system by Christianity and industrialization, "For young men mission Christianity became more appealing under Colonialism. Economic development in general, and trade, urbanization and schooling in particular, introduced new categories of social status—the literate teacher and clerks—and

[19] In *The Man-leopard Murders*, Pratten discusses in his section of "The Spirit Movement of the early 1900s" how Nigerians appropriated Western Christianity to meet their needs. One contention Nigerians expressed with Christianity was its ban on polygamy which was strong in Igbo culture. During the Spirit movement indigenous Christian churches that allowed polygamy sprang up. p.99-114.

increased their physical and political mobility" (94). This class used unions as "political vehicles" to govern their villages and built political authority. However instead of working to advance its society, this class developed into a repressive machine working against the Nigerian masses.

Unlike what Achebe would have his readers believe, the UPU does not represent the Nigerian masses as these unions practiced absolute discrimination against the initiation of the uneducated and illiterate members of Nigerian society. In this way they were able to set themselves off as a class of their own, distinct from the illiterate masses. They acted as intermediaries between the Nigerian populace and the colonial power, "Among the Igbo union rules were drawn up ensuring that disputes were heard by a union prior to judgment in a court of law."[20] Unions had sufficient room to exploit the masses as they positioned themselves as obstacles between the Nigerian populace and the colonial administration. One interesting aspect of this endeavor is that this usurping class worked in compliance with colonial authority as opposed to the elder chiefs who served to undermine it. Because they benefitted from the colonial machine, these unions promoted colonial Government as an ally of the people. Pratten records that during the Women's War of 1929 when Nigerian Igbo women were protesting increased taxation, these unions took to the streets to quell the stammer of revolution—reassuring the masses of the benevolence of the Government despite Britain's violent and bloody response to the protests.[21]

In his narrative, Chinua Achebe also explores the concept of language as cultural marker. In other worlds, language links one to his culture. Thus people who want emphasize their cultural identity are possessive of their language, or attribute certain significance to its use. In the colonial encounter where several languages from different and often opposing sources converge, the use of language is complicated. Since individuals are dealing with a complex linguistic heritage, it becomes a matter of context. Gikandi's essay argues that Chinua Achebe's representation of the colonial encounter from an African perspective relocated Africa from the periphery to the center. British culture, Englishness, then becomes the Other and African culture is posited as the Subject in the world of Achebe's narrative. This is important to keep in mind if we want to understand the intermediary role that language plays between cultural others: Africans and Europeans. Language works as Achebe's marker for delineating the cultural make-up of colonial Nigeria.

In one particular scene in *No Longer at Ease*, Chinua Achebe showcases the significance and power of language in the colonial world. The protagonist Obi Okonkwo, working as the secretary to the Scholarship Board which grants federal scholarships to candidates to study abroad, is visited by a stranger. After introducing himself as Mr. Mark and sensing a kinship with Obi because of their common ethnicity as Igbos, the gentlemen proceeds to hint to the possibility of a bribe in exchange for Obi's help in securing candidacy for his sister. However because of the European present in the room with them, Miss. Tomlinson, and the sensitivity of his subject, Mr. Mark is conscious about how he presents his case. He invokes language to navigate the dangerous waters of his situation: he initially engages Obi in English to greet him. But when he gets to the matter at hand, he code-switches to the native tongue of Igbo. This

[20] Pratten,, p.98.
[21] Pratten, p.114-129.

echoes the way in which the European novel, taking its cue from imperialism has traditionally Othered Africa as a savage territory. Using European languages, most notably English, to speak about and represent Africa without the knowledge and consent of Africans and lacking true knowledge about African culture, Europe has created a Euro-centric discourse about Africa: a space of convenient assumptions to other Africans as savages. In the Western canon, language serves to facilitate the subjugation of non-Western peoples.

In our scene, Mr. Mark exercises a power that allows him to open, close, and navigate between two worlds through the use of language. Unlike the European who—supported by hegemony—only recognizes her language as the only legitimate entity, the native is not limited to only one mode of communication that might compromise his message. The native Ibo speaker communes between two worlds. Within the confine of this scene, Mr. Mark recognizes that there is a sphere for privacy, reserved for fellow Igbos, and a sphere for public exposure. As the colonizing language, English is spoken by both Africans and Europeans. It is also has the effect of under cutting the language barrier between the various ethnic tribes of Nigeria. Thus the shared language becomes a very public mode of communication. However Igbo is a language unique to the Igbo culture and its people. For Mr. Mark and various other Igbo speakers who use it the same way, the Igbo language becomes a private place—a retreat from the prying ears of the English Other. Mr. Mark clearly speaks perfect English as evident by his introduction to Obi. He does not resort to Igbo as a necessity but as a luxury. As a member of Igbo society, a culture which takes pride in its difference, Mr. Mark finds security in his native tongue. His apprehension about using English to communicate such a topic as sensitive as bribery is evident in his action of whispering "some words that he had to say in English" (98). English does not provide the same security. In this sense the Igbo language takes the form of resistance against the English-oriented world—a secret communication that subverts English.

In the conversation between Obi and Mr. Mark, language is used to initiate intimacy. English is played off as a cold, objective, and formal interaction. Igbo, on the hand, is personal and satisfying, signifying kinship and understanding. The reason why Mr. Mark others Miss Tomlinson is to establish kinship and familiarity with his fellow Igbo. By enclosing Obi and himself in this contained world of the mother tongue that Miss Tomlinson cannot penetrate with her English, Mr. Mark is reclaiming the physical space conquered by the British, linguistically. Nigeria can then be re-evaluated as an area of contention between Igbo, a native tongue, and the colonizing English: between Others. And in order emphasis this connection and set both of them in opposition to the English Other, Mr. Mark uses the Igbo language to reaffirm his shared status with Obi as Igbo subjects. Upon entering the Obi's office, Mr. Mark notices Miss Tomlinson and is quickly started as he recognizes her as a threat to the imagined fraternity he shares with Obi. He side-steps this obstacle with not only the Igbo language, but also he does it with a rhetoric of inclusiveness.

The familiarity he assumes with Obi can only be described as a phenomenon out of Anderson's work. As soon as he initiates the Igbo language, he delves into the sad story of his sister's situation as if Obi's own experiences and perspective correlate with his own. Simply by virtue of their shared heritage, Obi is expected to understand and perform a favor in the name of an imagined fraternity. Mr. Mark remarks, "We are both Ibos and I cannot hide anything from you" (99). He says this confidently as if there are no secrets between Igbos; as if the Igbo language is a mutually shared safe zone away from the mutual enemy of the English Other. He

continues to confide in Obi: "It is all well sending in forms, but you know what our country is" (99). The rhetoric of inclusion continues as he juts in the inclusive "our country" into his speech. Mr. Mark falls into the same trap of nationalism that Anderson warns of, the trap of imagining and assuming that individuals in the same "space" have a similar understanding and experience of reality. All this comes even after Obi establishes that he "didn't think [that Mr. Mark was even] Ibo" (98). It is the Igbo language that informs Obi of Mr. Mark's identity as an Igbo. If either one had, for some reason, forgotten the Igbo tongue and spoke only English there would be nothing to connect them to each other. They would simply pass each other on the street without being aware of their common Igbo heritage. Their cultural sameness depended on their shared language

## Conclusion

Achebe's work *in No Longer at Ease* fails to engender an alternative African canon. Rather his corrective objective and its lack of a subversive agenda suggest that the reason behind the West's Othering of the African in its canon was due to the Other's intellectual inability to represent himself. But since the dawn of Western education in Africa, the African—as personified by Achebe the writer—has finally been able to assert his voice in the Western canon by representing himself accurately to his former master. The novelist utilizes *No Longer at Ease* to argue back to Europe that the African savage is an invention. In his work he constructs a complex Africa dealing with the burden of colonial take-over; most specifically the heavy weight of Western cultural hegemony. His argument testifies that Obi Okonkwo is not inherently corrupt. However Obi is presented with no choice by his society but to self-destruct since the colonial system set in place by England proves to be inherently flawed.

Obi's trials and tribulation in the narrative speak to Brown's thoughts on the indigenous perceptions of colonial Government. Since colonized people only think of "central authority in terms of powerful alien, exploiters," Obi finds himself in a precarious position once he accepts employment in government. The indigenous perception of Obi's position is, "To occupy a 'European post' was second only to actually being a European" (105). Obi, an indigenous Black man, has infiltrated the domain of the cultural other. However it is only superficial infiltration since posts left by Europeans have simply been filled by Africans. Obi's mistake is assuming that his Western education would qualify him to survive in this position—without considering the fact these posts were not design for Africans to inhabit. He soon finds himself living like a European in Africa, a lifestyle that involves a certain car, a personal driver, an expensive house, and the repayment of his scholarship. He also soon finds himself accruing a tremendous amount of debt: making payments not only on his lifestyle but also for his parents as well as financing his brother's education. His attempt at reconciling an English individualist lifestyle with his African communal responsibilities becomes so destructive that he is forced to accept bribes in order to make ends meet. As the story concludes the protagonist becomes what he detested the most—the bribe taking African of his contempt.

Obi's downfall is the result of his misguided attempt at performing the role of a European in colonial Africa. The colonial administrative system does not recognize the African citizen in which it is meant to govern. It is a machine for Europeans to govern. At his trial, Obi becomes the target of the same homogenizing Othering that he subjected non-Western educated Africans to when Mr. Green remarks, about Obi's actions: "The African is corrupt through and through." (3). In *No Longer at Ease*, Achebe demonstrates to Obi that bribery is not inherent in Igbo

society but it is something whose need is fostered by colonial culture. Initially an outsider unable to understand bribery, Achebe brings Obi into the inside by having him experience bribery as it functions in Igbo society. It can then be argued that Achebe attempts to correct Obi's Christian missionary and Western education induced misconceptions about Africa. Obi's baptism addresses England as well—denouncing English hubris. Achebe's corrective work in *No Longer at Ease* indicates the novelist's incredible popularity outside of Africa to the point in which the author has become synonymous with African literature. Westerners often remark on the beauty of not only Achebe's prose but also the dignity and humanity he artfully instills in his reader. However Achebe does nothing to challenge the West outside of providing brief exoticism. The novelist works better as an ethnographer of African culture than as the renegade inventor of Africa in literature.

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# *Survival of Bifidobacterium animalis ssp. lactis DSMZ 10140 and Bifidobacterium animalis ssp. animalis ATCC 25527 during manufacture and storage of ice cream.*

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## Abstract

Probiotic bacteria are defined as "live microorganisms which when administered in adequate amounts confer a health benefit on the host" (FAO/WHO 2002); Based on this definition, to exert health benefits the organisms must be viable when consumed. In this study, survival of *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 and *B. animalis* ssp. *lactis* DSMZ 10140 was studied in ice cream over time by measuring viable counts on MRS agar plates incubated anaerobically at 37°C. These organisms were chosen because of their close genetic similarity and reported differences in technological properties. Subspecies specific PCR was used to verify the identity of colonies counted. Results show growth patterns of *B. animalis* ssp. *lactis* DSMZ 10140 and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 were very similar suggesting survival in ice cream is not subspecies dependent.

## Introduction

Probotics are live microorganisms which when administered in adequate amount confer a health benefit on the host (FAO/WHO 2002).
Probiotics have been proven to reduce duration and occurrence of diarrhea through maintenance of the gut microbiota, maintenance of guy homeostasis or stimulation of the immune system. Other reported health benefits associated with probiotics are the ability to stimulate the immune system, regulate the inflammatory response and alleviate allergic reactions. Probiotics may decrease inflammatory bowel disease and modify serum cholesterol levels in humans and reduce the risk of cardiovascular disease.

*Bifidobacterium* species represent a significant proportion of the probiotic cultures used in the food industry (P. Langhendries, J. Detry, J. van Hees and J.M. Lamboray, 1995). Members of the genus *Bifidobacterium* are among the most common microorganisms in the human colon, and they are considered to be important in maintaining a well balanced intestinal microflora (P. Langhendries, J. Detry, J. van Hees and J.M. Lamboray, 1995). Bifidobacteria have been shown to have beneficial properties, such as preventing diarrhea and intestinal infections, alleviation of constipation, and production of antimicrobials against harmful intestinal bacteria, and immunostimulation

(M. Saavedra, A. Abi-Hanna, N. Moore and R. Yolken, 1998). Some strains have been linked to probiotic function when added as living cells into milk products or supplied in animal food or as capsules. *Bifidobacterium* are considered to be obligate anaerobic bacteria (B. Biavati, b. Sgorbati, V. Scardovi, 1991). However, strains of *B. animalis* ssp. *lactis* are described as being able to grow at low oxygen concentrations in liquid medium (L. Meile, K. Fischer, T. Leisinger, 1995). These aerotolerant bifidobacteria species possess some of the oxygen or oxygen radicals scavenging mechanisms which are not detected in other strictly anaerobic bacteria, such as NADH oxidases, peroxidases, or superoxide dismutase (L. Meile, K. Fischer, T. Leisinger, 1995).

One of the most common subspecies of *Bifidobacterium* used in probiotics is *Bifidobacterium animalis* ssp. *lactis* (*B. animalis* ssp. *lactis)* because of its oxygen tolerance which allows for better stability in probiotic containing production. *Bifidobacterium animalis* ssp. *lactis* is gram-positive, non motile, non-sporeforming, irregularly rod-shaped cell, sometimes arranged in pairs, but not in chains. *B. animalis* ssp. *lactis* is anaerobic; no growth occurring on agar plates exposed to air. However, the *B. animalis* ssp. *lactis* can tolerate 10% of oxygen in the headspace atmosphere above liquid media. The optimum growth temperature is between 39°C and 42°C no growth has been observed above 46°C (Y. Cai, M. Matasumoto, Y. Benno. 1997). The other subspecies of *Bifidobacterium* being evaluated in this study is *Bifidobacterium animalis* ssp. *animalis (B. animalis* ssp. *animalis)* which is highly similar to *B. animalis* ssp. *lactis.* The sequence similarity is defined by analysis of the Idh gene which shows that *B. animalis* ssp. *animalis* is the most closely related strain to *B. animalis* ssp. *lactis*. The genetic relatedness of strains can be assessed using 16S rDNA gene sequencing which can differentiate between species.

Some differences between *B. animalis* ssp. *lactis* and *B. animalis* ssp. *animalis* is that they possess different abilities to grow on milk-based medium and in milk-based products. *B. animalis* ssp. *lactis* strains, such as DSMZ 10140, and very few *B. animalis* ssp. *animalis* strains are able to grow in milk. *B. animalis* ssp. *animalis* 25527 grows very poorly in milk (M. Ventura, R. Zink. 2002). This distinction is one of the reasons why *B. animalis* ssp. *animalis* and *B. animalis* ssp. *lactis* are considered to be different subspecies and not synonyms.

In this experiment, survival of *B. animalis* ssp. *lactis* DSMZ 10140 and *B. animalis* ssp. *animalis* ATCC 25527 during freezing and storage in ice cream will be tested. Since *B. animalis* ssp. *lactis* and *animalis* are both anaerobic bacteria, the aerobic environment in the ice cream may be a potential problem in survival. The very cold temperatures may cause cell injury and/or death and also present problems with survival. However, rapid freezing resulting in small ice crystals may preserve the cells.

The objective of this study is to compare survival of *B. animalis* ssp. *animalis* 25527 and *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 during freezing and storage of ice cream. The primary methods of analysis are enumeration of Bifidobacterium from ice cream by viable cell counting followed by subspecies confirmation using PCR.

## Materials and Methods

### 1. Media Preparation

MRS plates and broth was prepared using manufacturers directions, sterilized. MRS agar ((reference number: 288130, lot number: 9051993, 4.5g Difco agar (reference number: 214530, lot number: 8035322)) was poured and hardened. After preparation, MRS media was autoclaved for 20 minutes, cooled, and refrigerated until use.

2. **Acquisition of *bifidobacterial* strains stock culture preparation.**

   Isolates of *Bifidobacterium animalis* ssp*. lactis DSMZ 10140* and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 were be obtained and made into stock culture using glycerol.

3. **Genus identification of *Bifidobacterium animalis* ssp. *lactis DSMZ 10140* and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 by PCR.**

   A single or partial colony from each plate was deposited in the bottom of a 0.2ml thin-walled PCR tube (Corning Inc., Corning, NY) using a sterile inoculating needle. (Briczinski, 2004) Cells were lysed by microwaving the PCR tubes at power level six for seven minutes. *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 strains were identified by amplification of a sequence in the 16S rDNA spacer regions using primers Bflac2 and Bflac5 (Ventura, Reniero et al. 2001) *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 were identified by amplification of a sequence in the 23S rDNA and 16S-23S r DNA spacer regions with primers Ban 2 and 23Si (Ventura and Zink 2002).A negative PCR control was included using no template DNA. Following amplification, the reaction mixtures were separated on a 1.0% agarose gel (Promega Corporation, Madison, WI) using .5x TBE buffer (45mM tris, 45mM boric acid, 1mM EDTA, pH 8.0). Electrophoresis was performed using a submerged horizontal gel electrophoresis system at approximately 70 volts. The gel was stained using a solution of ethidium bromide (0.5µg/ml) and water and de-staining using distilled water. Bands were visualized on a UV transilluminator at 260 nm and images were captured with an AlphaImager 3300 Gel Documentation System (Alpha Innotech Corp., San Leandro, CA)

4. **Stock culture preparation**

   A portion of thawed samples of *Bifidobacterium animalis* ssp*. lactis DSMZ 10140* and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 were streaked for isolation on MRS agar. From each bacteria sample, an isolated colony from MRS agar was transferred to 10ml of MRS broth and incubated at 37°C until turbid (18-24 hours). The turbid broth was mixed with an equal volume of sterile 20% glycerol (w/v) and distilled water (Briczinski, 2007). Ten portions of 5.0ml *Bifidobacterium animalis* ssp*. lactis DSMZ 10140* and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 suspensions were dispensed into sterile cryovials (Nalgene, Rochester, NY) and frozen as stock culture at -70°C. Working cultures of the bacteria were prepared by transferring 200 µL of stock culture to a 10 ml volume of fresh broth or by transferring an isolated colony from an agar plate streaked with the stock culture to 10ml of MRS broth.

5. **Inoculum Preparation:**

From stock culture, 100 µl of *Bifidobacterium animalis* ssp. *lactis* and *Bifidobacterium animalis* ssp. *animalis*, respectively were inoculated into 10 ml of MRS broth and incubated anaerobically for 24 hours. Sterile MRS broth was inoculated with 100 µl MRS broth containing *B. animalis ssp. animals* and *B. animalis ssp. lactis* respectively and incubated anaerobically for 14-16 hours. After incubation, 1.0 ml of inoculated MRS broth was aliquot into 100 ml of sterile broth and anerobically incubated for 24 hours. Then 5.0 ml of the previous inoculated MRS broth was aliquot into each 500 ml plastic dilution bottle and incubated for 24 hours. After incubation, the inoculated broth from each 500 ml bottle was diluted to $10^{-6}$ and plated in duplicates on MRS agar to $10^{-8}$ to determine a viable count.

6. **Centrifugation**

Six bottles, each containing 151 ml of inoculated MRS broth from the 500 ml bottles was transferred into 200 ml centrifuge bottles, balanced and centrifuged at 4°C and 6000 rpm for 20 minutes. Supernatant from each bottle was aseptically poured off into a beaker. Cells were re-suspended in 100 ml of sterile 0.1% Bacto Peptone (reference # 211677, Lot # 2177375) water. Bottles were then re-centrifuged, using the same conditions. After aseptically discarding supernatant, 20 ml of milk was added to each bottle and vortexed to re-suspend the cells resulting in 60 ml of concentrated, washed cells. Cells from this suspension were plated at dilutions of $10^{-5}$ $10^{-6,}$ and $10^{-7}$ to establish a viable count. Cell input and cell output were calculated to determine a total cell loss.

7. **Preparation and analysis of inoculated ice cream.**

Creamery ice cream mix was obtained (Table 2). 15 kg of mix was split into 5.0kg lots using a balance and sanitized holding containers. A Taylor batch freezer was rinsed and sanitized using XY-12 prior to processing and between each treatment. Prior to freezing, 20ml of the concentrated suspension of Bifidobacterium *animalis ssp. lactis DSMZ 10140* or *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 to the treated samples (nothing into the control). Following addition samples were mixed well to disperse the culture and then frozen under agitation. Ice cream temperature was measured immediately after ejection and weights were measured for calculation of overrun. Overrun was calculated by subtracting the weight of ice cream mix from the weight of ice cream divided by the weight of ice cream multiplied by 100. After freezing, the ice cream was ejected into three-gallon tubs, and then packaged into sanitized pint containers for hardening and stored in a freezer at -25°C. Ice cream mix composition was obtained (Bonnie Ford).

8. **Sampling Procedures**

11g of each ice cream mix treatment was aliquot into a sterile 99ml dilution blank for plating on MRS agar to $10^{-5,}$ $10^{-6}$, and $10^{-7}$ in duplicate and anaerobically incubated for 72 hours. After hardening for 24 hours, 1g of melted ice cream was plated for viable cell counting on MRS agar and coliform testing on Violet-red bile agar. Each product was diluted and plated on MRS agar at dilutions of $10^{-5,}$ $10^{-6,}$ and $10^{-7}$ in duplicate and anaerobically incubated for 72 hours. After growth, viable cells were counted. Random colonies of bifidobacteria were picked from an isolated colony and using colony PCR, subspecies identification was confirmed.

## Results and Discussion

### Stock Culture preparation and PCR subspecies verification

A total of ten stock culture vials were prepared with glycerol and stored in a freezer at -70°C. PCR was done with inoculated MRS media used during the growth curve, after ice cream mix inoculation and after ice cream hardening. Agarose gel was analyzed using an Alpha Imager under UV light. The gel's results showed that there was no contamination. Each colony analyzed, negative and positive control gave the expected reaction (Figure 2). *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 results were about 680 base pairs and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 results were about 467 base pairs. This matched up with the expected reaction on the 100 base pair DNA ladder showing the results were correct.

### Growth of *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 *and Bifidobacterium animalis* ssp. *animalis* ATCC 25527

Optical density in respect to time of *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 *and Bifidobacterium animalis* ssp. *animalis* ATCC 25527 are shown in table 2. Optical density measurements were taken every hour for fourteen hours and a last measurement was taken after twenty-four hours using a Spectrometer 21; between each measurement MRS broth was anerobically incubated. This data shows that there was a constant growth for both *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 *and Bifidobacterium animalis* ssp. *animalis* ATCC 25527 during the course of measurements taken. Growth rates of both organisms were similar as expected, both organisms went through lag and a slight log phase. This could have been due to possible injury of cells; because *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 *and Bifidobacterium animalis* ssp. *animalis* ATCC 25527 are both anaerobic organisms the hourly exposure to oxygen could have had an effect on the growth rate. *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 is however 10% oxygen tolerant, therefore this minimum amount of exposure to oxygen should not have significantly affected the growth of this organism.

### Cell harvest and concentration efficiency

Viable cell counts were usedto evaluate the survival of each subspecies. Before inoculating the ice cream mix with the respective organism the initial count had to be calculated (Table 1). When cells were concentrated the percent recovery was calculated from initial viable cell counts and viable cell counts after centrifugation. *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 had a 110.63% recovery while *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 only had a 48.73% recovery. This difference in cell

recovery could have been due to the extensive exposure to oxygen, and *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 is oxygen tolerant allowing it to, in this case, grow while being in an aerobic environment, where as there was only a 48.73% recovery in *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 because it is not oxygen tolerant. *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 also favors growth in dairy products whereas *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 does not. Loss in cells in *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 could have also been due to the extreme agitation to the centrifuge bottles, when being centrifuged and when trying to re-suspend the cells in the 0.1% Bacto Peptone as well as skim milk. The temperature of the centrifuge could have also caused some cell injury and loss due to the optimum growth temperature of both organisms being 37 to 42°C and the temperature they were being centrifuged at was between 4 and 10°C. The results overall suggest there was little loss of *B. animalis ssp. animalis* and *B. animalis ssp. lactis* during harvesting.

**Survival of *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 and *Bifidobacterium animalis ssp. lactis DSMZ 10140* in ice cream.**

*Bifidobacterium animalis* ssp. *animalis* ATCC 25527 had a lower cell count than *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140, this was expected due to the aerobic environment, and the survival of *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 is more favorable. After freezing, ice cream treatments were diluted and plated to $10^8$; counts were recorded after 24 hours, 5 days, 7 days, and 11 days in freezer storage at -25°C. Using the initial count of *B. animalis ssp. animalis* ATCC 25527 and *B. animalis ssp. lactis* DSMZ 10140 ice cream mix, viable cell counts and each viable cell count after plating, the percent log reduction was calculated. The log reduction value is a ratio of the initial log substance in cfu/g divided by the substance in cfu/g after storage. The percent log reduction shows that at 11 days *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 had a 0.18% reduction whereas *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 had a 0.79% reduction, which means *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 has had a greater cell loss since the ice cream mix inoculation initial count. This is unexpected because of the oxygen tolerant, lactose thriving characteristics of *B. animalis* ssp. *lactis* DSMZ 10140, however this could be due to the low temperatures in the storage freezer (-25°C) and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 possibly being a more resilient subspecies. These results could also be due to the short observation time, if studied for a longer period of time, the expected results may show.

The percent overrun in each ice cream mix was calculated using the weights of the initial ice cream mix before freezing and the weight of the ice cream after freezing (Table 2). The control had the highest percent overrun at 78.1%, *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 had the lowest percent overrun at 73.3%, and *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 was in between with 75.3% overrun. Overrun is the measure of the amount of air mixed into an ice cream mix. The differences in the overrun percentages could have been due to the additional bacteria added to the treatment mixes and compared to nothing being added to the control which may have allowed more air to be mixed in. All ice cream treatments were mixed to 160 viscosities.

**Conclusion**

In conclusion, both organisms had a similar survival rate; there was not a significant difference in the populations of each organism in ice cream. The data presented in Table 4 and Figure 1 indicate little death of the organism during the time period of the study suggesting survival of both organism in ice cream is very similar. This could be due to the short length of storage or a result of the genetic similarity of the two stains studied. The hypothesis was proven incorrect and survival of *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 and *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 does not appear to be subspecies dependent.

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**Tables and Figures**

**Table 1: Recovery of cells during inoculum preparation.**

| Sample | 1. Initial Population (CFU/g) | 2. Total number of cells | 3. Concentration of cells harvested (CFU/g) | 4. Total number of cells harvested | 5. Percent Recovery |
|---|---|---|---|---|---|
| DSMZ 10140 | $1.08x10^{9}$ | $4.89x10^{11}$ | $1.72x10^{10}$ | $1.03x10^{12}$ | 110.63% |
| ATCC 25527 | $5.20x10^{8}$ | $2.36x10^{11}$ | $5.85x10^{9}$ | $3.51x10^{11}$ | 48.73% |

1. **Viable cell count of inoculum**
2. **Total number of cells= (viable cell count (cfu/ml) x total ml of cells)**
3. **Viable cell count of concentrated cells following centrifugation, washing, re-centrifugation and milk re-suspension.**
4. **Total Viable cells harvested= population of harvested cells x final volume**
5. **** % Recovery= (initial population- population) x 100**
   **(initial population)**

**Table 2:** Ice cream mix composition used for experimental ice creams

| **Ingredient** | **Formula** |
|---|---|
| Total Fat | 14.10% |
| MSNF | 10.50% |
| Corn Syrup Solids | 3.70% |
| Cane Sugar | *12.97% |
| Stabilizers | .500% |

*** % Ingredient= lbs of ingredient x100**
**Total # of lbs**

**Table 3:** Overrun in experimental ice creams.

| Product | Weight of mix (g) | Weight of Ice Cream (g) | * Percent Overrun |
|---|---|---|---|
| Control | 518.5 | 291.2 | 78.1 |
| DSMZ 10140 | 518.5 | 295.8 | 75.3 |
| ATCC 25527 | 518.5 | 299.2 | 73.3 |

* $$\% \text{ Overrun} = \frac{(\text{weight of mix} - \text{weight of ice cream})}{(\text{weight of ice cream})} \times 100$$

**Table 4:** Survival of probiotic *Bifidobacteria* in ice cream stored over time at -25°C.

| Time (days) | DSMZ 10140 (CFU/g) | % Log Reduction[1] | ATCC 25527 (CFU/g) | % Log Reduction |
|---|---|---|---|---|
| 0 (mix) | $8.00x10^7$ | n/a | $2.00x10^7$ | n/a |
| 1 | $1.66x10^7$ | 0.68% | $1.46x10^7$ | 0.14% |
| 5 | $2.90x10^7$ | 0.44% | $2.01x10^7$ | -0.002% |
| 7 | $4.50x10^7$ | 0.25% | $1.77x10^7$ | 0.05% |
| 11 | $1.31x10^7$ | 0.79% | $1.34x10^7$ | 0.17% |
| 13 | $1.59x10^7$ | 0.70% | $9.80x10^6$ | 0.31% |

Percent log reduction is also shown.

**[1] % Log Reduction: log (No/N) No =initial cfu/g; N=cfu/g after storage**

**Table 5:** Primers used in PCR reaction.

| **Species** | **Primers** |
|---|---|
| *Bifidobacterium animalis* ssp. *animalis* ATCC 25527 | 23si, Ban 2 |
| *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 | Bflac 2, Bflac 5 |
| *Bifidobacterium* | Lm 3, Lm 26 |

**Figure 1:** Change in viable counts of DSMZ 10140 and ATCC 25527 in ice cream after 1, 5, 7, 11 and 13 days frozen storage.

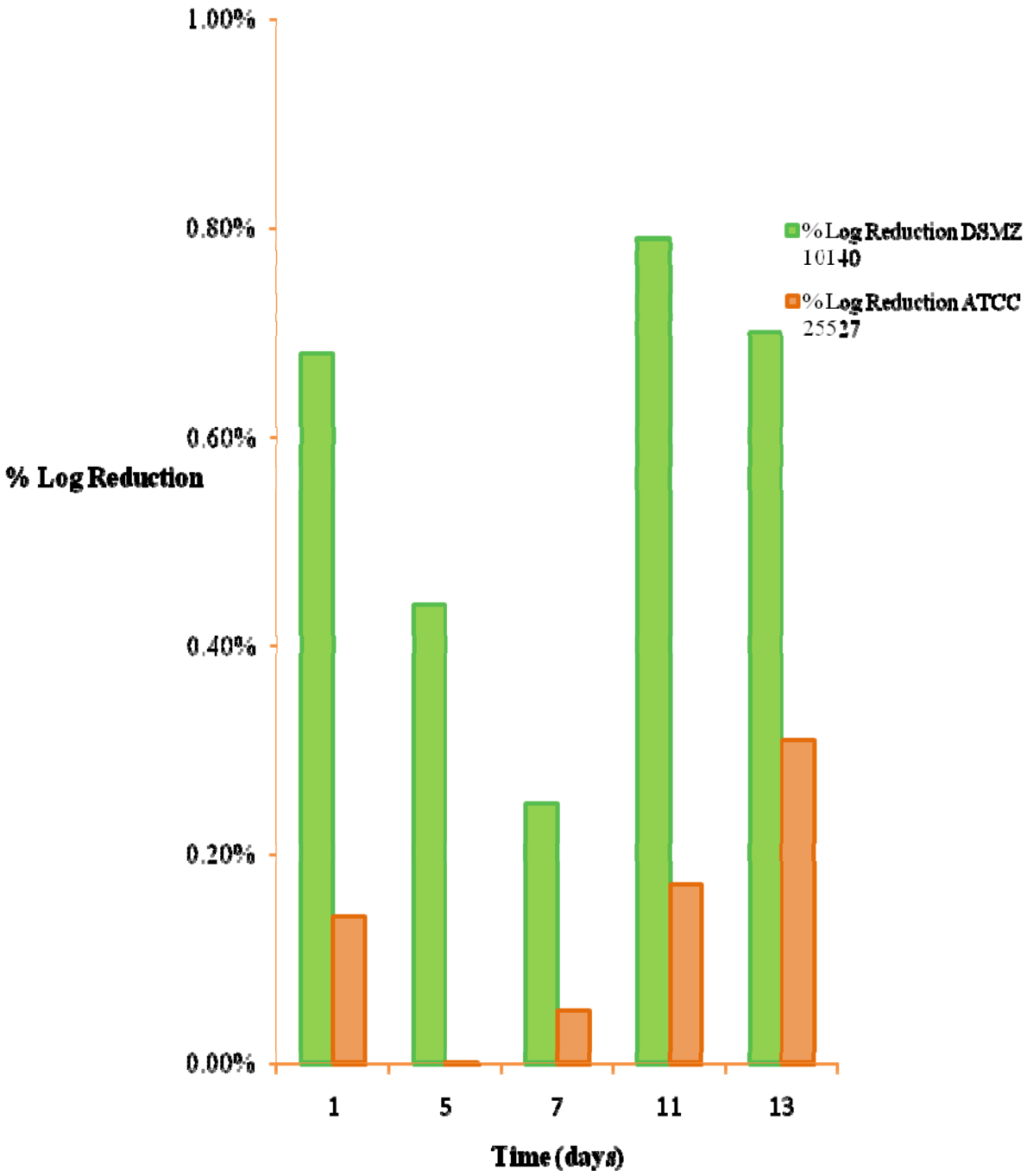
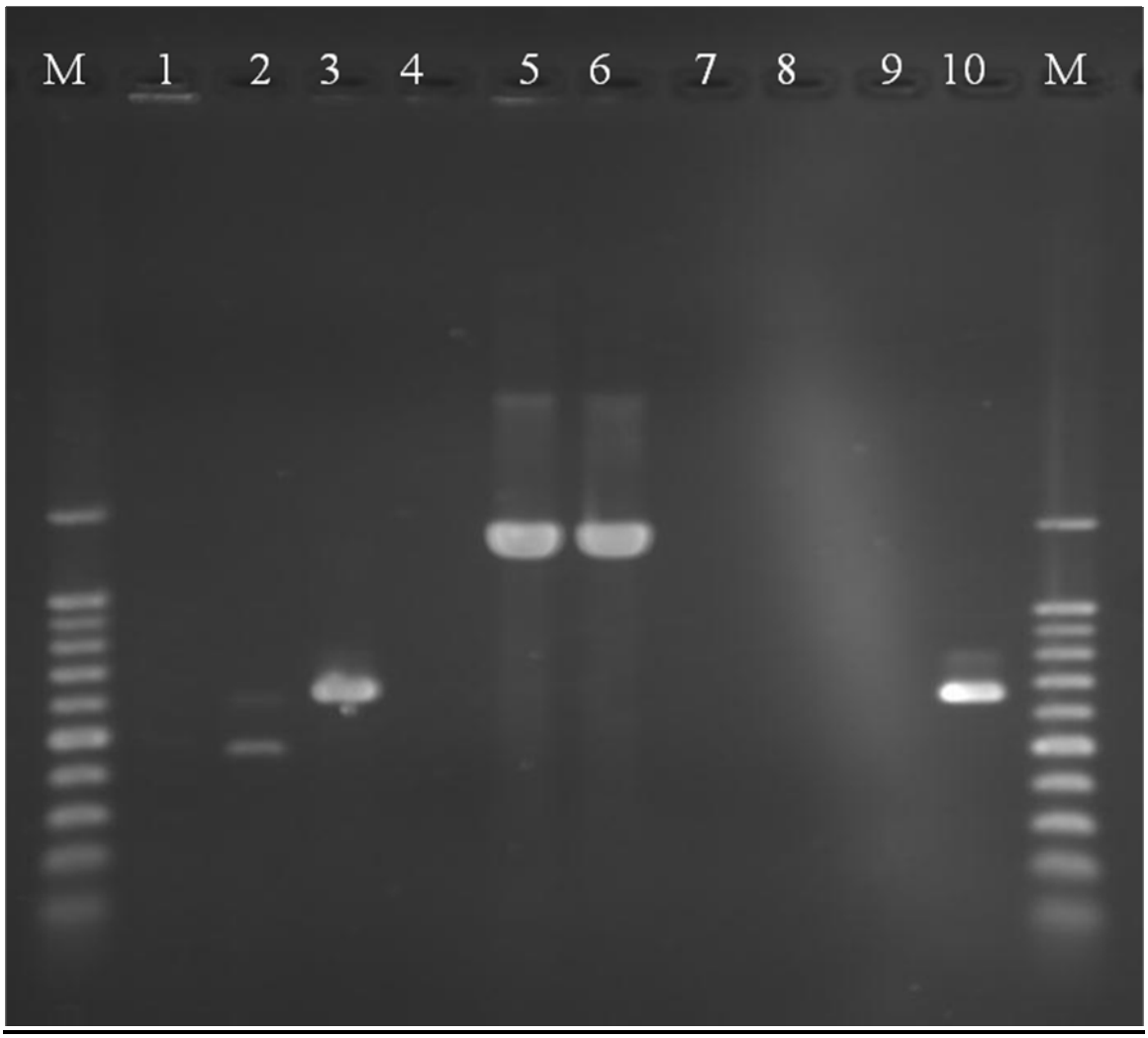
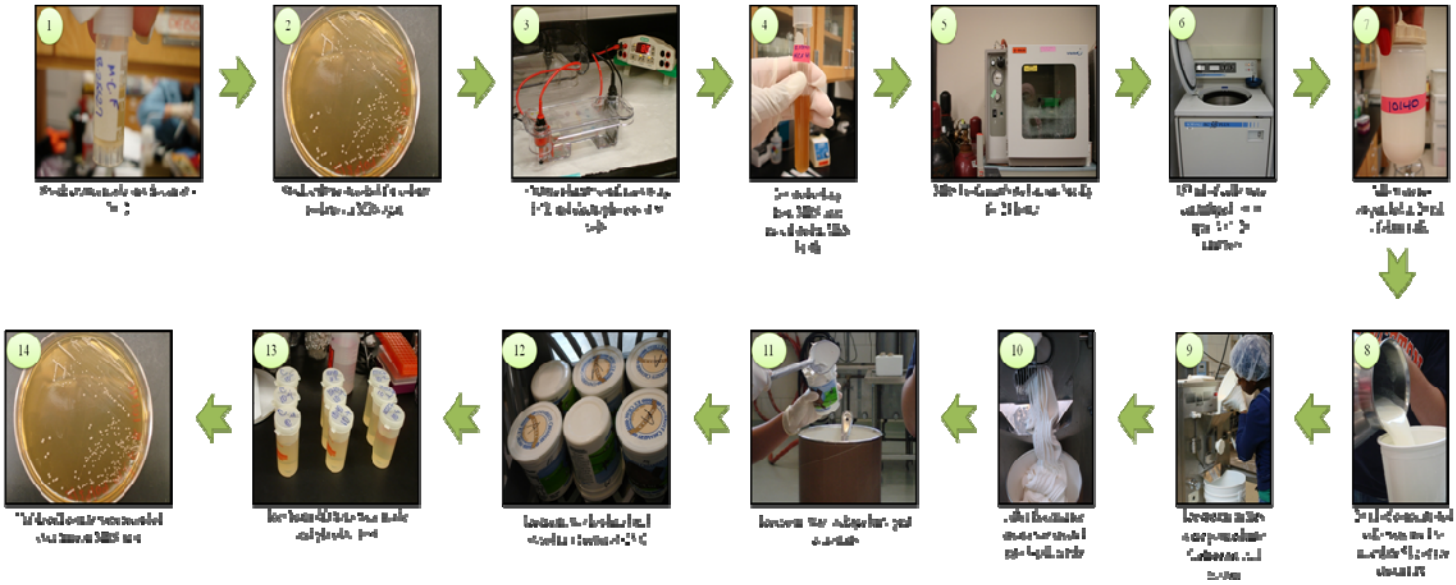


**Figure 2:** Colony PCR done with genus subspecies specific primers and one isolated colonly of bacteriafor identity confirmation of *Bifidobacterium animalis* ssp. *lactis* DSMZ 10140 *and Bifidobacterium animalis* ssp. *animalis* ATCC 25527 done 24 hours after freezing

| Lane | Sample | Expected Reaction |
|---|---|---|
| M | DNA Ladder | 100 bp Ladder |
| 1 | DSMZ 10140 + *animalis* subspecies primers[1] | Negative |
| 2 | ATCC 25527 +*animalis* subspecies primers | 467 bp |
| 3 | DSMZ 10140 + *lactis* subspecies primers[2] | 680 bp |
| 4 | ATCC 25527 + *lactis* subspecies primers | Negative |
| 5 | DSMZ 10140 + *Bifidobacterium* genus primers[3] | 1350 bp |
| 6 | ATCC 25527 + *Bifidobacterium* genus primers | 1350 bp |
| 7 | ATCC 25527+ no primers (negative control) | Negative |
| 8 | DSMZ 10140 + no primers (negative control) | Negative |
| 9 | *Bifidobacterium* + no primers (negative control) | Negative |
| 10 | Isolated DSMZ 10140 DNA + *lactis* subspecies primers (positive control) | 680 bp |
| M | DNA Ladder | 100 bp Ladder |


M 1 2 3 4 5 6 7 8 9 10 M

**<u>Figure 3:</u> Pictorial Flow Diagram of ice cream experiment:**



# *What Happened to Creative Nonfiction?*

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Creative nonfiction writers have produced some of the most influential articles of our time. From heart-breaking memoirs to incredibly perceptive profiles, readers are consistently presented with a unique outlook on the world, a creative delivery of everyday facts. Writers of the genre observe and convey real life, with implications that stretch from reminding people of what a massive world we inhabit to using words that offer consolation and remind someone that come what may they aren't alone. Not only does it present something special for the reader, it also allows the writer to become immersed in their project, to learn or understand something about themselves and all of humanity. When accomplished, creative nonfiction works are challenging but truly rewarding and simultaneously provide an escape and a reality-check for writers and readers alike. But through the passing of time, creative nonfiction changes and develops. There are now numerous accounts of writers publishing lies and deceiving their readers, sullying the good name of the genre—as well as readers feeling that the nonfiction piece they just read may actually be false. What happened to Creative Nonfiction? Can it be fixed? Can it be restored as a dignified genre?

There is no definitive place or time known for the beginning of creative nonfiction. However, Ernest Hemingway's *A Moveable Feast* presents a strong base to start from, one that is visible in other author's works throughout the progress and different movements of the genre leading up to today. *A Moveable Feast* is a set of memoirs, documenting Hemingway's time spent abroad in Paris. Edited by his fourth wife, the posthumously published collection is considered a fiction novel. In the preface of the book, Hemingway explains that though written according to fact, some things are left out or forgotten and informs the reader that it may be read as fiction:

> If the reader prefers, this book may be regarded as fiction. But there is always the chance that such a book of fiction may throw some light on what has been written as fact. (ix)

Despite this note, the book is commonly thought of as a memoir. Some critics believe that Hemingway's unedited accounts of his acquaintances in Paris—writers like Gertrude Stein and F. Scott Fitzgerald, both American writers and members of the "Lost Generation" of artists—are less than generous. So, it is prudent to continue publishing the book as fiction. Nonfiction published under the fiction genre is reasonably less controversial than the opposite: a fabricated story published under the pretence of fact.

A new edition of *A Moveable Feast* is currently going through publication. With changes made by one of Hemingway's grandsons, this new edition is said to be a closer

version of what Hemingway tried to achieve—an extremely thin argument because no one but Hemingway himself could say what he wanted to accomplish. Any version published is therefore no more accurate than its predecessor, making it unable to ever carry the label of nonfiction. And still, it is an inspiration to creative nonfiction writers like Lee Gutkind (proclaimed Godfather of the genre and editor of the Creative Nonfiction Journal) who, on his personal website, claims all of Hemingway's works are inspirations.

Gutkind also gives enormous credit to writer Gay Talese, who is frequently referred to as one of the fathers of New Journalism (a genre that developed in the 1960's and 70's from the inspirations of writers like Talese and Hemingway.) However, Talese began practicing what he calls "the art of hanging around" long before New Journalism emerged as a popular genre. Talese actually rejects the term "New Journalism" believing that it suggests a "sloppiness with the facts" while Talese, who began his writing career as a newspaper reporter is more concerned with being accurate than writing the best story. In the introduction to his book, *Fame and Obscurity*, Gay Talese describes the New Journalism: "Though often reading like fiction, it is not fiction. It is, or should be, as reliable as the most reliable reportage, although it seeks a larger truth than is possible through the mere compilation of verifiable facts, the use of direct quotations, and adherence to the rigid organizational style of the older form."

In his most famous profile, published in April of 1966 in Esquire magazine under the title "Frank Sinatra has a Cold," Talese delivers an incredibly insightful portrait of a man he never gets to interview. Instead, he develops his profile of the aging crooner by hanging around and observing him, documenting his interactions and getting stories and interviews with the people closest to him. Talese is so sure of his accuracy in everything he writes that it is hard to distrust him, but how much freedom should creative nonfiction writers ultimately have over their work?

The significance of "New Journalism" is that it marked a major change in the genre after Hemingway. It not only attracted nonfiction writers looking to add novel devices to their work, but also conventionally fiction writers who wanted to explore in the realms of fact. Whether or not Talese remains accurate in his own work, he is nonetheless correct in saying that New Journalists are a little loose with the facts. Tom Wolfe, one of the founders of the new journalism movement, achieved this style by procrastinating on an expected article. Finding himself under pressure to meet a deadline, he turned in an article completely focusing on his own opinion about the subject at hand—completely ignoring the conventional reportorial rules ("Tom Wolfe").

As journalistic tendencies decreased, story-telling techniques such as compression and composite characters became more widely used; creating greater cause for critics of the genre to begin scrutinizing the works of creative nonfiction writers. Compression is the act of combing several scenes or interviews into one. It is helpful in nonfiction because it allows writers to manipulate what fiction writers have complete control over. Make-believe is much more flexible than fact. Composite characters solve a similar problem, but with people instead of scenes. Of course, both of these techniques are considered unethical in nonfiction work and naturally are not so controversial when used in fiction, but both prove very useful as solutions to some of the problems creative nonfiction writers face—such as word limits and the importance of the arc of the story. Even Gay Talese admits to necessarily rewording quotes and writing about other people's

thoughts, while still able to claim that he is never challenged over false reporting. Though considering the thin between lies and artistic license, how accurate can Creative Nonfiction ever really be?

In an interview with WordPirates, managing editor of the Creative Nonfiction journal, Hattie Fletcher admits the somewhat obvious—that creative nonfiction writers sometimes face unavoidable issues. Writers can find some guidance for dealing with any problems they may face, but there can be no set of rules because, according to Fletcher, "at the end of the day, every writer has to do his or her own grappling." In the same interview with Word Pirates, in regards to the difference between artistic license and deception, she states:

> I think artistic license can extend pretty far, but transparency is key. There's a different contract with the reader in nonfiction—namely, that the things you're writing about really happened, and that the characters really exist, etc.—and when that turns out not to be the case, readers feel deceived. When you look at the scandals that bring this question up, it's almost always the case that the writers didn't let readers in on the decisions they made, to use composite characters or compression or whatever. An author's note can go a long way.

Author's notes, like the one from Hemingway in the preface of *A Moveable Feast,* make a trustworthy connection between reader and writer. With that simple author's note, writers save themselves from accusation of deceit and assure readers that they are getting the closest version to fact as possible. So, a creative nonfiction piece may use some questionable techniques, but it can stay nonfiction so long as the writer-reader bond remains intact.

On his website, Lee Gutkind elaborates on the role of the writer in his explanation of creative nonfiction:

> Although it sounds a bit affected and presumptuous, "creative nonfiction" precisely describes what the form is all about. The word "creative" refers simply to the use of literary craft in presenting nonfiction—that is, factually accurate prose about real people and events—in a compelling, vivid manner. To put it another way, creative nonfiction writers do not make things up; they make ideas and information that already exist more interesting and, often, more accessible.

In several of his works, he mentions the "Creative Nonfiction Police," noting that there are no "police" to control authors and their ideas, but that instead there is a recommended code for writers—a kind of checklist. First on the list is the should-be simple task of striving for truth. Second, is acknowledging the difference between recalled conversations and made-up dialogue. The third is avoiding the unnecessary use of compression, composite characters, etc. And the last is to give the characters in the work a chance to stand up for themselves. This may be a difficult task, but in the end it assures the characters and the readers and it protects the author from public humiliation (Nguyen 352-354). Unfortunately, not all writers follow this checklist, making it more difficult to revive the once good name of Creative Nonfiction.

Recently, some very serious scandals surfaced in the media, the most commonly heard of being the James Frey controversy. Frey published his memoir *A Million Little Pieces* claiming it to be factually accurate. Oprah picked it for her book club and it topped the New York Times best-seller's list for 15 weeks. These statistics are hardly

relevant, except to push the point that this man made a lot of money and gained a lot of publicity all based off of a lie. Money is a strong instigator of poor ethics in creative nonfiction. However, the uncovering of his lies ultimately led to the destruction of Frey's public image. Frey confessed to strongly exaggerating some parts of the book and completely fabricating others. The book no longer holds its Oprah Book Club title, the talk-show host publicly confronted Frey on her show, and his name is now synonymous with unethical practices in creative nonfiction.

Frey is publishing his newest book, *Bright Shiny Morning,* as fiction, even though he claims that most of it is factually accurate. Publishing as fiction allows him to maintain control over his story. Frey says that publishing it as fiction was partly in response to the controversy of *A Million Little Pieces* but adds, "It was also just to make the book the best book I could write, you know? If it's fiction there are no rules. I can write what I want, how I want. And sometimes altering facts or inventing facts in a work of fiction makes the book do certain things. You know—sometimes to be funny, sometimes to be sad, sometimes to try to make a point. So I felt that I had the freedom to do it this time" (Interview).

Returning to the controversy surrounding *A Million Little Pieces*, it is crucial here to note that many people believe it is the fault of the editor for not fact-checking before publication. Frey's editor was Nan Talese, the wife of Gay Talese, who according to her husband really believed in what Frey wrote. It is beneficial to fact-check the story before publication—but in her defense, fact checking is quickly becoming a dying art and there is hard evidence that even the best fact checking is vulnerable to liars.

That evidence is found in the form of Stephen Glass, an ex-reporter for The New Republic. In his time at The New Republic, he wrote 41 stories, more than half of which are partly or completely fabricated. Glass succeeded several times in covering his tracks and fooling the fact-checkers at the magazine. The publication of one article cost him his job in 1998. "Hack Heaven" is about a 15-year old hacker who breaks through the online security system of Jukt Micronics, a software firm created by Glass for the purpose of his story. When writer Adam Penenberg from Forbes magazine decided to do his own checking of Glass's article, he discovered what other's had missed—that Glass lied. Penenberg presented his accusations along with proof to Glass's boss, Charles Lane, who then took responsibility to continue what Penenberg started. With this particular article, in order to get past the fact-checkers, Glass invented everything from a fake website for Jukt Micronics, to fake notes from a fictitious conference, a fake voicemail that actually led to his brother's phone, and several editions of a fake hacker newsletter. Fact-checkers are sieves that catch what the writer missed—unfortunately the checkers at some places are deficient, some places don't have enough checkers and others don't have any, making it easy for lies to seep into the mainstream media. As with the Frey controversy, the discovery of his lies destroyed Glass's public image. A movie about his story, Shattered Glass, opened in 2003, and since then Glass wrote his own version of the story, which he published as fiction ("Stephen Glass").

In the cases of James Frey and Stephen Glass, both eventually admitted to their lies. But, there are times when confronting an author with suspicions of deceit may cross a line. There are two recent memoirs that pose such a dilemma—*The Girl with the Apple*, a romanticized version of one couple's love story, and *The Kiss*, an extremely controversial memoir about an incestuous affair between a father and daughter.

The first story was denied publication as a memoir, after it was discovered that the first meeting of Herman and Roma Rosenblat was not factually accurate. Herman's version, that he continues to support, is that he and his wife met during the holocaust. She tossed apples over the fence into the concentration camp where he was being held. Years later they met on a blind date, and soon after were married. The real version is not completely different, but young Roma never threw apples over the fence to Herman—they had only been in similar situations and found each other years later on a blind date, bonding over their mutual horrifying experience. Herman defends himself by claiming that his version of the story is how he always pictured it, and that he was trying to "bring happiness to people." It's difficult to prove that a memory is false, but ultimately, Herman should have considered using that author's note. Without it, Rosenblat is added to the "swelling ranks of discredited memoirists" and the middle of all of the controversy surrounding moral and ethics in nonfiction—the same controversy that is sullying the good name of creative nonfiction and shaming writers who practice it. The Rosenblat's story was eventually published in the form of a fiction novel ("Herman Rosenblat…hoax").

The second story, by Kathryn Harrison, really stretches the limits of creative nonfiction. Not only does it cover her perverted relationship with her father, it also discusses the problems between her and her mother—which she uses as a shield, protecting herself from blame. The novel caused critics to accuse Harrison of sensationalism and to condemn her supposed desire to make money by writing about such a forbidden topic. Still being published as a memoir, *The Kiss* is difficult to classify and difficult to refute. Harrison's inappropriate relationship with her father is very personal and creates around her a protective sensitivity barrier. The story, which she unsuccessfully published several times as fiction, remains a mystery because of this barrier. Everyone questions the accuracy of the memoir, but no one is willing to dig deeper into such a touchy subject. It should not be so difficult to invest trust in an author, but becomes increasingly difficult due to more media coverage about unethical creative nonfiction writers.

So, what happened to creative nonfiction? The 1990's produced a lot of memoirs and almost saw the end of morality within the genre. It seems to get more and more difficult to find writers who are more concerned with accuracy than making a mint off of a romanticized story. However, there is still hope that the genre will survive. Creative nonfiction is still very young, and as with all things we must learn to accept its unavoidable imperfections, things like the use of compression and the unfortunate presence of unethical authors. There will always be a critic trying to call out the next liar, as there should be, but writers now need to prove the critics wrong—prove they can be held to high standards of writing.

Can we fix it? Creative nonfiction is always in the hands of the writer, it is their story, their work—but they need to remember authors like Hemingway, who protected his work by simply letting go of the nonfiction label and Talese, who did what was necessary for his work without sacrificing the facts. Both writers and their works are still respected today, and any accusations that arise are successfully refuted. Writers of today must also follow the code laid forth by our godfather Lee Gutkind. As a creative nonfiction writer, reporting fact is the priority. There are precautions worth taking, like collecting several accounts of a story to assure the ultimate in factual reporting or sending

the finished work to anyone involved to allow them the chance of refuting anything before publication—which also protects the writer from public accusations that ruin reputations. Writers have the privilege adding an author's note if any doubt surrounds a work, to maintain a strong bond between reader and writer, but it should not be used lightly. If too much doubt surrounds a work, the smartest decision is leaving behind the nonfiction classification and publishing as fiction. These small steps may seem trivial or unnecessary—and some may even see them as an annoyance or impediment coming between an author and the perfect story—but precision, honestly, and accuracy can help save the genre that has been pushed to the edge countless times.

Can it be restored as a dignified genre? Creative nonfiction can become a respected genre, escape the constantly shining spotlight of controversy, and regain the dignity it achieved more than 30 years ago. The information presented here and more proves that we are moving into a brand new journalism, a further extension in creative nonfiction—one that hopefully will bring back the dignity to the genre. Creative nonfiction is no longer the art of writing fact; it is the endeavor to write factually accurate information in an artistic and creative way. Though still an art form, it is the effort of writing accurately that will protect the authors who achieve it, also possibly leading to the undermining of those who unfortunately fail. From Hemingway to Talese to James Frey, creative nonfiction never stops changing—no one can say where it will go in the future, and that's ok—we'll get there eventually. Today, we can only put forth our best effort and by using our new definition, we'll hopefully reverse the criticisms and save creative nonfiction.

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# *Understanding the Benefits and Barriers to Mentoring: The Experience of Black Faculty in Academia*

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*Abstract*

Many researchers have addressed the benefits of mentoring for Black students, yet little is known about their mentors, who are often Black professors. This study addresses three questions: How do Black faculty benefit from mentoring, how do Black students benefit from the support faculty offer, and what barriers keep Black faculty from mentoring students. This is a qualitative study. Interviews were conducted with eleven Black faculties at a large research university. Findings indicate that although Black faculty sees the benefits of mentoring for themselves and students, institutional pressures may be hindering them from mentoring more.

## Introduction

There is an achievement gap between Black and White college students, which shows differences in academic performance. For those entering college, 56% of Black Americans never graduate, as compared to 36% of White Americans (Brower & Ketterhagen, 2004). The college graduation rate for Blacks is 40%, which is 21% lower than the 61% graduation rate of White students ("Persisting Racial Gap," 2004). Further, fewer than a third of Black men who enter four-year colleges as freshmen graduate within six years, the lowest six-year graduation rate among all racial and ethnic groups, according to analysis by Shaun R. Harper (Schmidt, 2009).

Perhaps these retention problems can be explained by the low levels of academic and social integration of black college students. Tinto's model of student retention highlights the importance of academic and social integration for all students. This model provides variables that can increase the retention rate of Black college students.

Tinto's model for retention in colleges and universities stresses that academic and social integration are important for success in college (Severiens &Wolff, 2008). Academic integration is the development of a strong affiliation with the college academic environment both in the classroom and outside of classroom (Kraemer, 1997). Social integration is the development of a strong affiliation with the college social environment both in the classroom and outside the class (Kraemer, 1997). Without these two areas, the likelihood of succeeding in college is not as high (Severiens &Wolff, 2008). With high proportions of Black students dropping out of college, the need to explore what factors prevent attrition and promote academic and social integration for

Black students. Student faculty interaction is vital for student retention (Lee, 1999), and mentoring and informal relationships with faculty have been shown to positively influence the integration of Black students (Allen, 1992). Mentors provide just what these students need to be successful in the college and university settings: support, understanding, positive role modeling, and instruction for people in different stations of life (Hurte, 2002). According to Holmes, Land, and Hinton-Hudson (2007) students "who participate in formal and/or informal mentoring relationships are more likely to persist and succeed in higher education than those who do not" (p.105)

The literature states what students gain from being mentored by faculty. It explains why it is important for Black students to be mentored and how it helps with academic achievement, academic success, social integration and connection to campus. Mentoring students is expected of all professors regardless of race/ethnicity, however Black faculty tend to be overwhelmed with this responsibility more often that faculty from other backgrounds (Allen, Epps, Guillory, Suh, & Bonous-Hammarth, 2000). Black faculty often feel like it is their duty to mentors, so they engage in mentoring more students than their white peers (Allen, et al., 2000; Beaz, 2000). Black faculty often feel especially obligated to Black students because the history of racial and ethnic inequalities in today's society (Allen, et al., 2000).

These scholars suggest Black faculty renowned for mentoring students for. Whether it is inside the classroom or outside of an academic setting, Black faculty have inspired many students. While we know Black faculty have been helpful in mentoring students, there has not been much research from the faculty perspective addressing their experiences in these relationships.

The purpose of my study is to understand the relationships Black faculty form with students from the faculty perspective. My research questions are: How do Black faculty think students benefit from mentoring? How do Black faculty benefit from mentoring? What forces shape how much Black faculty work with Black students?

## Literature Review

Tinto's model of college student retention suggests that when students fully participate in the college experience both in and outside of the classroom, they increase their social and academic integration and are more likely to excel in college and graduate successfully (Severiens and Wolff, 2008). According to Severeins and Wolff (2008), informal integration is essential to academic and social integration so students can excel in college. Informal academic integration refers to relationships between teachers and students outside of the classroom (Severeins and Wolff 2008). Informal social integration includes factors like social contact and participation in student activities (Severeins and Wolff, 2008).

Similarly, there are two forms of interaction for student faculty relationships: formal and informal. Formal interaction includes structured experiences in the academic setting such as group work, labs, and classroom. Informal faculty interaction is important as well (Lee, 1999). Both of these components, out of the classroom and in the classroom interactions, are essential for student retention (Lee, 1999). Since student faculty interaction is important for student retention and academic success in college, we should focus on mentoring and its importance for students, especially Black students.

There are many benefits that students gain from mentoring. According to Credle and Dean (1991), it is important for Black students to be mentored once they enter college. Mentoring offers students positive role models and helps them with academic problems

(Redmond, 1990). Mentors can also help protégés continue on to graduate college and make choices about various career options (Blackwell, 1989; Dutton, 2003; Juarez, 1991). Mentors can also increase the numbers of minority students who enter into graduate school (Hurte, 2002; Juarez, 1991). These mentoring relationships can help minority students engage in research experience in fields related to their future careers (Cawyer, Simonds, & Davis, 2002). And professors can show these students how to deal with issues of prejudice they may face as students through these interactions (Allen et al., 2000).

Some researchers have suggested that mentors and mentees both benefit from the mentoring relationships. Mentors gain satisfaction by helping students, respect for their own capability as professionals, and examine their own past through their interactions with students (Dutton, 2003; Patitu & Terrell, 1997). However, research also explains that mentoring can be very challenging for Black professors and very time consuming. They are described as being expected to give students social support and counseling, writing letters of recommendation, helping with selecting graduate or professional schools, reviewing job and fellowship/scholarships applications (Allen, et al., 2000).

Black faculty face many demands and priorities as they pursue the collegiate experience in the academe. Not only do they perform these responsibilities, they also are overwhelmed with obligations to their departments, university, and community (Bowen & Schuster, 1986). Black faculty members are also expected to serve on committees that focus on minority issues, racial/ethnic relations, recruitment of faculty and students of color, university relations, and community outreach (Allen, et al., 2000; Beaz, 2000; Tierney & Bensimon, 1996).

With all of these responsibilities and expectations around serving their university and community, often their research agenda suffers. Black professors are also not as likely to be tenured when compared to white counterparts because they spend more time with teaching and administrative tasks as opposed to working on research and publications (Astin, Antonio, Cress, & Astin, 1997; Nettles & Perna, 1995). According to Nettles and Perna (1995), all faculty members have to perform research and deliver scholarly publications, teaching, advising, mentoring, and committee responsibilities. Depending on the institution, each of these criteria weighs differently in the tenure process (Jarvis, 1991; Tierney and Benison, 1996). Certain institutions emphasize scholarship as the main criteria, especially research universities (Blackburn and Lawerence, 1995; Tierney and Bensimon, 1996). Prior research says that service is required by all faculty members, but it is not valued highly in the tenure process and faculty members are often punished for over engagement in service activities (Baez, 2000; Tierney and Bensimon, 1996). Mentoring, advising, and serving on committees are not seen as important as producing research or publications. The reason being because they see a personal or social benefit to engaging in service (Cuadraz, 1997; Johnsurd, 1993; Padilla and Chavez, 1997; Pollard, 1990). This often means that they are not as successful in the tenure process (Banks, 1984; Blackwell, 1981; Menges & Exum, 1983). They tend to have lower academic rank and work at less prestigious institutions (Astin, Antonio, Cress & Astin, 1997; Nettles & Perna, 1995). Because of this they often spend more time advising, mentoring students and serving on committees and it makes it harder for them to gain tenure. Serving on committees can be beneficial to faculty members and the institution since it can increase the diversity of perspectives (Menges and Exum, 1983), it helps to fill the needs of people of color (Tack and Patitu, 1992), and it can be a personal reward for faculty of color as well (Johnsrud 1993). Since Black faculty have responsibilities to teach, advise, serve on diversity issues committees, and try

to produce research, it makes it harder for Black faculty to mentor students without losing focus on their other work.

## Methods

The primary method used in this study is a qualitative design. The participants are 11 professors employed at a large research university. My general goal is to explore the relationships that Black professors form with Black students. My research questions are:

1. How do Black faculty think students benefit from mentoring?
2. How do Black faculty benefit from mentoring?
3. What forces shape how much Black faculty work with Black students?

### Institutional Site

The qualitative data used in this study were collected from professors employed from one institution: Royal University (pseudonym). Royal University is a large, public, research university that is located on the East Coast in the mid-Atlantic region. In the fall of 2007, Royal's total enrollment was 36,014: 25,857 were undergraduates and 10,157 were graduate students. The undergraduate racial/ethnic breakdown is 57% White, 13% African-American, 6% Hispanic, 14 Asian/Pacific Islander, 0% American Indian/Alaskan Native. The total number of faculty employed at the institution are 3,752: 2,896 were full time faculty. The tenure/non tenure track faculty population included 1,464 members. The faculty racial/ethnic breakdown is 72.9% White, 10.2% African American, 2.8% Hispanic, 8.6% Asian, and 0.1% Native American.

## Participants

There were 11 participants in this study; all were full-time Black faculty at Royal University when interviewed. The sample was comprised of 6 males and 5 females. The faculty were from various fields of study, five of the participants teach in the social sciences, three in mathematics or engineering, two in life and physical sciences, two in humanities, one in the arts, and one in the interdisciplinary program. Their academic rank varied three were assistant professors, four were associate professors, and four were full professors.

## Procedures

The data I analyzed for this project was collected by Dr. Kimberly Griffin between 2006 and 2007. Based on an interest in having ample sample representation by gender, rank, and discipline, interview participants were selected and recruited using purposeful rather than random sampling (Bogdan and Biklen, 1998). Key administrators at Royal University assisted with identifying Black faculty at their campus, compiling contact lists, and emailing potential participants. Snowball sampling (Bogdan and Biklen, 1998) was also used to recruit participants. Participants were asked to recommend other African American faculty that could add additional insight by their involvement in the project.

Each faculty member who agreed to be in the study participated in a 1-on-1 semi-structured interview (Bogdan and Biklen, 1998) with Dr. Griffin. Prior to each interview, participants completed a brief demographic questionnaire, taking approximately 2-3 minutes to complete. Interviews followed, taking approximately 60 to 90 minutes to complete. In this interview, participants talked about several topics related to their lives as professors, and focused especially on their mentoring of Black students. To ensure confidentiality, all participants and the institution they work at were assigned pseudonyms. Professors were asked permission to tape the interviews, which were later transcribed verbatim for analysis.

## Data Analysis

Data were analyzed by reading 11 interviews provided by Dr. Griffin. First, I compiled notes on the professors' responses based on how these responses related to my research questions. Second, I developed a list of codes that pertain to what related to my research questions. The lists of codes were: “motivation”, “benefit,” and “support,” these codes were attached to any statement when a professor discussed their reasons for mentoring, how they viewed their helpfulness and when they offered support to Black students. These codes were used to organize my data. Using the codes, I looked back through the interviews, and attached the codes to the quotes. I then made a new code: “barriers”, which was attached to any statement when a professor talks about when they were not able to mentor a student for a particular reason. I then analyzed coded data and grouped quotes into patterns, which I call themes, and described how these patterns relate back to my research questions.

## Findings

Themes emerging from the data show that Black faculty members see how students benefit from mentoring, Faculty have benefited themselves from mentoring, but there are also barriers that Black faculty face in academia that may hinder them from devoting their time to mentor students.

### Student Benefits

According to Allen, et al. (2000), the informal relationship between faculty and students has a positive influence on Black students and their academic achievement. Throughout the interviews many Black faculty expressed various benefits they think students gain from these mentoring relationships. First, social support was seen a positive experience, and faculty said students gained a closer relationship with these faculty members, which enable them to receive help when needed. Professor Shawn Johnson expresses he has a close relationship with his students. Students were able to talk with him not only about personal issues, but also academic issues to solve problems

> “I feel like I have a closer professional relationship and that that they feel more comfortable to come in and just sit down and talk and to complain and whine . . . and I just for the most part listen, and we try to problem-solve and we think through stuff”

Professor Jackson made sure that the one of the students he worked with was able to receive help so she can achieve all of her goals and dreams.

“I think we established a relationship early on that I was willing to help in any way I could to help make sure she succeeded . . ." Professor Smith, on the other hand, just wanted to connect with her students by doing more than just greeting them. She wants to get to know them on a more personal level, not just as students in her class:

“I want to connect in more ways than just saying hi. If I have time, I’ll try to get to know a little bit more about the person.”

These quotes explained the sort of social support each professor offered their students.

Fostered skill development was also a benefit to students from these mentoring relationships. Students were able to gain research experience, learning how to write and publish in scholarly journals, but they learned these skills through hard work and dedication.

Professor Johnson makes sure to offer his students research opportunities through writing and publishing articles. This shows that he wants his students to be involved in contributing to the collection of scholars that pertain to their respective fields.

Professor Hayward wants her students to not have their hand held in the research experience. Challenging and teaching them how to gain these skills offers her students great tools for graduate school:

> "I am really one of those people that believes that you shouldn't spoon feed or you shouldn't show people what all the research is – figure out how to motivate them and then train them as critical thinkers."

Professor Smith wants her students to accomplish their goals so they can successfully complete their doctoral program. "Try to work in a reciprocal way with them, try to understand what it is that they are trying to accomplish and help them meet their goals around their doctoral program."

Academic support was also offered, which could be a tremendous help to these students. They were able to learn about goal setting so they can achieve the goals they set out for themselves. Also, faculty offered support for entrance into graduate school, writing letters of recommendations so they can be competitive in the graduate admissions process. Professor Hempfield wrote a letter of recommendation for a student and they were accepted a graduate program: "He asked me to write him a letter and I was very happy to and he got accepted to the program." The student was able to get into the program through this relationship and hopefully will be successful in graduate school. Professor Johnson also expressed how he still keeps close contact with some of his students and writes letters of recommendations for them when they ask him: "I've had a couple of students who kind of keep in touch with me and I'm constantly writing letters of reference for them and things like that."

Professor Miller really wants to help her students choose between various course options and makes sure they succeed in their major of choice. This can also help them pursue graduate school in the future because they know it can be a goal in the long run: "I do try to help them think about long term goals in terms of what kind of courses, what they want their major to be in and what sorts of sub-disciplines they want to have in their vita given what they want to do . . ."

Faculty Benefits

Faculty also describe the benefits they receive from mentoring students. Faculty described learning new ways to improve their scholarship and intellectual growth. They also bond with these students. Faculty members expressed that there is a special bond that they form with Black students.

This faculty member learned not only how to improve her scholarship, but also the students taught her new ways to grow intellectually: "I think my scholarship is better, my intellectual growth is better, because of these interactions. They [students] keep me fresh. They keep me on my toes. They giving me new perspectives that I add to my scholarship and that increase my intellectual . . . growth."

Professor Williams is able to read and learn from her students to keep her fresh in her field and her research interest current. She can use these new ideas so she can approach new ways to develop skills and perfect them.

> "Well, one is knowledge.…they're working on things or approaching things in ways that are interesting and different and new and so I'm learning stuff and reading stuff I wouldn't necessarily have read otherwise and just being kept up in the field and in areas … that's one of the things I gain from it."

Professor Smith expresses a special connection she makes with her students, specially her Black students. They are able to engage in a relationship because of their similar racial

backgrounds. They relate to each other because they have similar issues and challenges they can share with each other.

> "I'm working with students of color, particularly African American students, that there's a different kind of bonding that happens, in part because typically the student relates to or I relate to something with them. We understand each other's sort of background experiences."

Not only do they learn from these students, faculty members gain personal rewards from these relationships. It makes them feel good about themselves and they get satisfaction from working with these students. Professor Richards is very proud of his student's accomplishments. He says it makes his "heart sing" to see them on television and award shows. He really gains a sense of happiness to see his students succeed:

> "I mean, seeing your students succeed is the best feeling that you can ever have. It's like I always want those students to go out and do work and be better than I am, so you see students, they're nominated for awards and winning awards and I see them on T.V. and . . . in a commercial . . . or on stage and it makes my heart sing. . ."

Professor Hempfield likes the fact he can see his students progress in their academic career. Also he gains satisfaction with these relationships because he realizes that the students look to him as inspiration to pursue their dreams because he is proof that it can be done.

> "If they're doing well, I think it feel always good to be helpful to someone and then to see that they're some sort of progressing a lot . . . but just the satisfaction that you've been able to kind of have an impact on that person . . . "

Factors Shaping Interaction

We know that Black faculty mentor more students than their white peers (Allen, et al., 2000), but there are factors that may hinder them from mentoring students. Black faculty have personal life issues just like other faculty members; they have families and also want time for themselves.

Professor Johnson not only has a personal life with his family, he also has to mentor his students, which can be time consuming. At times he isn't able to perform all of his family and academic duties because he has so many other obligations to attend to:

> "There are certain times when I'm trying to mentor a student through something and my kids are sitting there going, "Daddy, when are you going to play with us?" Or my wife is like, "OK, dinner's getting cold," . . . it certainly is time-consuming . . . You don't always have the time to give them [students] what they need, so they sometimes end up not getting the support that they really would like."

Professor Terry Robinson has to take care of her young child and advise students which makes it hard for her to balance these two responsibilities.

> ". . . I have a three year old, so I don't have the time to give to students . . . I was commuting an hour each way, couldn't possibly really see myself doing that with a three year old."

Prof Hayward talks about how doing research, being a single mother it can be too much on her plate. She says "there's only 24 hours in a day and she has to sleep at some point", so it can be hard to get everything done.

> "Because it's so time consuming and exhausting . . . I just would work harder on the weekends or just stay up later at night and do my own research. But also I'm a single mother, so if it doesn't take time away from my research it takes away from my time with my kids . . . There are only 24 hours in a day and I have to sleep some of those hours, as much as I hate to admit all that."

There is also a lot of work responsibilities faculty have to deal with, as well. They have to teach and advise students, work on diversity committees for minority issues, and also produce research and publications for the tenure and advancement process. All of these responsibilities can make it hard to mentor student and produce research. Professor Hayward has a hard time balancing mentoring her students and producing research. She expresses how not being able to produce scholarly research is going to hinder her in the tenure and advancement process and she is not able to produce scholarly research because she has multiple roles to perform:

> "I don't know if I've balanced it well, which is not to say that I'm totally there for my students. . . The other thing that I'm balancing is this engaged scholarship, which is also not what's going to get me tenure. So I have a lot of pushes and pulls and tensions"

Professor Jenkins has to produce publications as a young scholar and he is so focused on his research, he is not able to be accessible to his students. He expresses that it is very hard to maintain both responsibilities and he wished he would have more time to mentor students.

> ". . . Whether I had to do my research and get the publications out, versus not being as open and available to students . . . for idealistic young PhDs [They] want to be able to do it all"

Professor Robinson had a difficult time with one of her students who really needed her attention. She was also trying to teach, advise, and produce research creating conflicting priorities for this faculty member. She expressed the difficulty in trying to get all of these responsibilities done and trying to advance in the tenure process:

> ". . . We had another student who came first year who needed a lot of work and she was draining and my colleague and I at the other institution . . . and you're trying to finish your own work and teach courses and publish and do all the things that our profession requires of you, it really is a lot, and then when you have to argue with your institutions about why they should pay you a certain amount of money because you did this cultural work which enables them to retain the very students that they say they want, although they're not really doing anything to demonstrate that, it becomes a pain in the butt, then you get tired of that."

## Discussion and Implications

My analysis of the interview data showed many students do benefit from these mentoring relationships with students, especially black students. Students gain social support, academic support, and foster skill development that is beneficial to their academic success in college. These relationships show students that they can achieve their goals beyond undergrad and take strides to apply and be successful in graduate school. We know that mentoring is important to Black professors and can promote student success in college. Mentoring and informal relationships show a positive influence in college success, especially black students (Allen, 2000). According to Hurte (2002), students do gain support, understanding, positive role modeling, and instruction for people in different stations in life. The students get letters of

recommendations, help with graduate school process, and job and scholarship/fellowship applications (Allen, et al., 2000). Similar to this research faculty in this study expressed that they saw all of these benefits for students, and faculty thought students were able to succeed with all of this assistance they were able to provide for them.

Faculty members also gain benefits from these interactions with students as well. They learn new ways to grow intellectually to improve their scholarship. The bonding that they formed with these students, specifically Black students, was seen as a great experience for Black faculty. Since we know that Black faculty mentor more often they are satisfied by helping these students, they can gain respect for their own capability as a professional, and examine the past by interacting in the student's early career (Dutton, 2003; Patitu & Terrell, 1997). They also perform service because they see it as a personal or social benefit and in the interviews there were many faculty members that expressed service as something they enjoyed. They gained a lot by interacting with students.

However, there were some factors that shaped professors' level of interaction with their students. Mentoring students affected their available time with family, and also personal time. It was hard for them to work on their research and publications, and still spend time with kids and other personal hobbies. At times, some professors were working long hours during the day trying to accomplish their goals, but most times they are not able to get everything done. Work responsibilities are another barrier they face in their profession. In order to obtain tenure, the most important thing is producing research and scholarly publications. When Black faculty are teaching and advising, serving on diversity committees for faculty/student recruitment for people of color, trying to mentor students, they at times are not able to produce as many publications. Since Black faculty tend to mentor and participate in service more often, this means in many cases they are not able to get tenure (Banks, 1984; Blackwell, 1981; Menges & Exum, 1983).

## Implications

Based on my findings, I believe there are a few things that can be improved in the mentoring relationships between Black students and Black faculty. As stated throughout the literature, mentoring is not seen as a critical element in the tenure and advancement process. Mentoring is something that is valuable to not only to Black students, but Black faculty as well. More emphasis should be place on mentoring in the tenure and advancement process because mentoring can influence students' lives, especially Black students. Mentoring is one of the main reasons students, especially Black students to stay in college, it increasing our retention, graduation rates.

Promoting these relationships is very important, as well. Statistically only 6% of all faculty members at a four year college are Black faculty members, Universities need to recruit Black faculty. It is important to have Black faculty to mentor students, so that the small number of Black professors are not overwhelmed by the students who want to work with them. Even though recruiting Black faculty can promote interaction, I think connecting with a professor is the most important thing to consider when trying to improve Black student success. Having a diverse faculty not only for Black students, but all for students is very important. Having a diverse faculty can promote more diversity initiatives on campus and help more students learn from different faculty members from all ethnic/racial backgrounds. Encouraging more White faculty and Black students to work together is important. It shouldn't matter about race or ethnicity when it comes to mentoring Black students; the student receiving mentoring is the most important factor.

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# *Mediators of Employment Status and Depression in Multiple Sclerosis*

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Abstract

The current study examined possible reasons underlying the relationship between depression and job status in MS patients. Given that prior work has shown that stress, maladaptive coping strategies, and low levels of social support are associated with depression in MS, differences between work status groups on these variables was explored. Participants for the proposed study were thus divided into three groups: patients who work full-time, cut back on their work hours because of MS, and had to quit working due to MS symptoms. Differences between groups on measures of stress, coping, and social support were explored.

## Mediators of Employment Status and Depression in Multiple Sclerosis

Multiple Sclerosis is a disease that affects the central nervous system (CNS), which consists of the brain, spinal cord, and optic nerves. Everything we do, whether it is taking a step, solving a problem, or simply breathing, rely on the proper functioning of the CNS. In the brain, millions of nerve cells, called neurons, continually send and receive signals. Normally, the path in which the nerve signal travels is protected by a type of insulation called the myelin sheath. The myelin sheath is a fatty substance that surrounds and protects the nerve fibers. This insulation is essential for nerve signals to reach their target. In MS, the myelin sheath is destroyed, scar tissue forms (sclerosis) and the underlying wire-like nerve fiber is also damaged. This leads to a breakdown in the ability of the nerve cell to transmit signals. It is believed that the loss of myelin is the

result of mistaken attack by immune cells. Immune cells protect the body against foreign substances such as bacteria and viruses but in MS, something goes wrong. Immune cells infiltrate the brain and spinal cord, seek out the myelin, and attack. As ongoing inflammation and tissue damage occurs, nerve signals are disrupted. This causes unpredictable symptoms such as numbness or tingling to blindness or paralysis. These symptoms may be temporary or permanent (http://www.nationalmssociety.org/about-multiple-sclerosis/index.aspx).

People with MS can experience one of the four disease courses, ranging from mild and moderate, to severe. The first type of MS is Relapsing-Remitting MS. People with this type of MS experience an alteration between attacks (relapses) which progressively worsen each time, to partial or complete recovery (remissions). It is estimated that approximately 85 percent of MS patients experience this type of MS; therefore, it is the most common type of MS. The second type of MS is called Secondary-Progressive MS. This type of MS usually follows Relapsing-Remitting MS within ten years and is the second most common type of MS. People with this type of MS experience a steady, worsening progression of neurologic function with minor recoveries or plateaus. The third type of MS is called Primary-Progressive MS. People with this type of MS experience a slow, worsening progression of the disease from the beginning of disease onset without any relapses or remissions. It is approximated that ten percent of patients develop this type of MS. The fourth and rarest type of MS is Progressive-Relapsing MS. In this type of MS, people experiences a steady and progressive worsening of the disease but with clear attacks of worsen neurologic functioning (http://nationalmssociety.org/index.aspx).

Because MS symptoms are also common in depression, clinicians often overlook the diagnosis of depression in MS patients. People with MS have a higher risk of developing depression than the general population. It is estimated that the lifetime prevalence of clinical depression in MS is 50% (Beeney & Arnett, 2008). Prior research (Arnett, Barwick, & Beeney, 2008) has demonstrated that depression is associated with fatigue, cognitive dysfunction, physical disability, and pain, all of which are symptoms of MS. In one study (Beeney & Arnett, 2008), it was found that individuals with depression showed a memory bias for negative information. In addition, it was also found that there is a positive association between negative life events and depression. As a result, we can understand why people with MS have a greater risk of developing depression after the onset of MS disease as they would experience more negative outlook on life.

Vickrey et al. (1995) developed a self-report measure of health-related quality of life (HRQOL) for MS that compares HRQOL in MS with that in other diseases and with the general population. Health-related quality of life includes physical, mental and social health. Examples of the variables studied were general health perceptions, energy/fatigue, and social function, role limitations due to emotional and physical health problems, pain, health distress, overall quality of life and cognitive function. Findings from this study indicated that 23% of the patients needed help completing the questionnaire booklet, 13% missed between one and fifteen work or school days in the past month, and 25% missed between sixteen to thirty work or school days. When comparing between the MS group and the general population, MS patients scored lower overall on physical function and role limitations due to physical problems, social function, energy/fatigue, health perceptions, and role limitations due to emotional problems.

Benedict et al. (2005) performed a similar study on the quality of life in MS that accounts for physical disability, fatigue, cognition, mood disorder, personality, and behavior change. Findings indicated that MS patients reported lower quality of life than healthy controls and that depression and fatigue were the primary contributors to poor quality of life in MS. Moreover, it was also found that cognitively impaired patients were less likely to be employed or to be socially active.

Beatty et al. (1995) studied the demographic, clinical, and cognitive characteristics of MS patients who continue to work and tried to determine the factors that contribute to maintaining employment by MS patients by comparing thirty-eight patients who were still working to sixty-four patients who retired prematurely. Factors that have been known to contribute to the loss of employment include sensory and motor disturbances associated with the disease, physical disability, and cognitive impairments. Results of this study showed that patients who continue to work were younger, better educated, and less severely disabled than patients who had retired. In addition, patients who were still working were diagnosed at an earlier age and had MS for fewer years as well as having less impairment in cognitive performance. In conclusion, the study found that cognitive deficits, physical disability and age contribute to the premature retirement of MS patients from the work force. This study did not find a difference in the level of depression between patients who were working and those who had retired. However, we cannot assume that this finding is reliable because the most severely depressed MS patients may be the ones who did not volunteer to participate in the study. Therefore, this leads us to investigate further into the relationship between depression and job status in MS patients.

An interesting prior study (Blazer et al., 1994) looked at employment and depression in the general population. In this study, there was an unexpected finding that in the general population (non-MS), unemployment had a positive association with depression. Normally, we would think that unemployment causes depression as a result of loss of income to support the self and the family, but depression in MS seems to give just the opposite outcome. Factors that have been associated with depression in prior work may account for increased depression in employed MS patients. The unexpected result of previous findings warrants further investigation with our current study.

The current study examined possible reasons underlying the relationship between depression and job status in MS patients. Prior work has shown that MS patients working full-time report higher levels of depressed mood than patients who are working part-time versus those who are not working at all (Smith & Arnett, 2005). Given that prior work has shown that stress, maladaptive coping strategies, and low levels of social support are associated with depression in MS, differences between work status groups on these variables were explored. Mirroring Smith and Arnett (2005), participants for the proposed study were divided into three groups: patients who work full-time, patients who had to cut back on their work hours because of MS, and patients who have had to quit working due to MS symptoms. Differences between groups on measures of stress, coping, and social support were explored. It was predicted that the MS group that was still working would report higher stress levels, more maladaptive coping, and lower levels of social support.

## Method

### *Participants*

The participants were recruited from the Northwestern part of the USA and from a local MS support group based on referrals by neurologists. Participants with any history of one of following were excluded from the study: substance abuse, nervous system disorder other than MS, learning disability, severe physical or neurological impairment, and severe motor or visual impairment (Smith & Arnett, 2005). All participants were diagnosed with definite MS or probable MS by a board-certified neurologist.
Of the original 101 total participants, 4 were eliminated due to the following reasons: 1 had an unclear diagnosis, 1 had an extensive history of Electroconvulsive Therapy that was not evident at the time of the initial screening interview, 1 had a prior history of stroke, and 1 had a past history of head trauma from moving vehicle accident that resulted in 10-15 minutes loss of consciousness and also a possible history of learning disability. All participants were Caucasian. There were 17 (16.8%) males and 80 (79.2%) females in the study overall. The mean age was 47.34 years (SD = 8.95). The average level of education was 14.28 years (SD = 2. 01). There were 35 (34.7%) participants in the working (W) group, 18 (17.8%) in the cut back (CB) group, and 28 (27.7%) in the not working due to MS (NWMS) group. An additional group (n = 16 (15.8%)) was identified that included participants who quit working for reasons other than MS. Their data were not included in the present study.

### *Measures*

#### The Social Support Questionnaire (SSQ)

SSQ is a set of 27 questions which asks about people in the participants' environment who can provide them with help or support. Each question has two parts. The first part asks the participants to list up to nine people in their lives whom they can count on for help and/or support in ways described in each question. The second part asks the participants to rate their level of satisfaction with the support they have for each question on a scale of 1 to 6 with 1 being "very dissatisfied" and 6 being "very satisfied." If participants have no support, they can choose "no one." This measure yields two key indices: number of supports and satisfaction with support. Additionally, a summary index that combines these two indices can be derived. The summary index was used for the data analyses in the present study.

#### The Hassles & Uplifts Scale (HSUP)

The HSUP is a set of 53 questions which measures how things in daily life can be a negative (hassles) or positive (uplifts) event. Hassles are things that make one irritable, upset, or angry. Uplifts are things that makes one happy, joyful, or satisfied. In each item,

participants are to make a rating on the degree to which it is a hassle and then make another rating on the degree to which the item is an uplift within the last month. The rating scale ranges from 0 (none or not applicable) to 3 (a great deal) (Beeney & Arnett, 2008).

The COPE

The COPE (Carver et al., 1989) is a self-report survey which measures how people respond to certain situations or how people confront difficult and stressful events in life. The COPE is used to measure situational or dispositional coping tendencies. For the current study, we used it to measure dispositional coping tendencies. There are 52 items in the survey which are divided into four different categories, each with thirteen items. The COPE is also broken down into adaptive (Active Coping) and maladaptive (Avoidance Coping) clusters. Each cluster is again broken down into subscales. The Active Coping index includes the Active Coping, Planning, and Suppression of Competing Activities subscales. The Avoidance Coping index includes Mental Disengagement, Behavioral Disengagement, and Denial subscales. In each item, participants must rate how likely they are to do what is stated in the item on a scale of 1 to 4 with 1 being "I wouldn't do this at all" and 4 being "I would do this a lot" (Arnett et al., 2002). In addition to examining the Active and Avoidance coping indices, we compared groups on a combination of the two indices that provided an overall summary of adaptiveness of coping used. This was referred to as the "Active-Avoidance Composite score."

Chicago Multiscale Depression Inventory (CMDI)

The CMDI (Rabinowitz & Arnett, 2009) is a 42-item self-report depression questionnaire that measures different types of depression symptoms via three subscales: vegetative, mood, and evaluative. The CMDI was specifically designed for MS and other medical patient groups. Participants are asked to rate the extent to which each word or phrase describes them during the past week on a scale of 1 to 5, with 1 being "not at all" and 5 being "extremely." For the present study, we only looked at mood and evaluative scale of depression to avoid potential confound involved in vegetative symptoms of depression with MS disease symptoms.

Expanded Disability Status Scale (EDSS)

The EDSS is a rating scale that measures the level of disability in MS patients. The scale measures the physical and neurological aspects of patients' level of functioning, usually based on determination at a face-to-face meeting with a board-certified neurologist. The scale ranges from 0 to 10 with 0 being "normal neurologic exam and no disability" and 10 being "death due to MS." In the present study, we used a self-report version of the EDSS that was developed in consultation with a board-certified neurologist with expertise in MS. Participants had to rate themselves on the EDSS questionnaire a week prior to the testing. Once the self-report questionnaire was

completed, an experienced neuropsychologist in MS made the EDSS rating after receiving instructions from a neurologist specializing in MS (Arnett et al., 2001).

### *Procedure*

Participants were called for a screening procedure over the phone; those who met inclusion criteria were scheduled for an appointment to come into the office. Participants were administered a series of measures as part of an ongoing neuropsychological battery. All participants gave informed consent and the study was approved by the Institutional Review Board (IRB) at Penn State University. Participants were debriefed after the completion of the study. Each participant was reimbursed $75 and also received written and oral feedback on their neuropsychological test performance.

## Results

After analyzing data using the Statistical Package for the Social Sciences (SPSS), we found five variables that were significantly associated with employment group status: age, symptom duration, diagnosis duration, EDSS, and FIS. Table 1 displays the means and standard deviations of all the variables that were analyzed.

In contrast to predictions, the groups did not differ on levels of depression, social support, or stress levels. However, the groups did differ in their coping strategies. Specifically, the "Cut Back" group used significantly more maladaptive coping compared with the other groups. Figure 1 displays the mean active-avoidance COPE composite score for the three job status groups.

Compared with the "Working" group, the "Not Working" group was older, had a longer duration of disease, more neurological disability, and higher fatigue levels. Figures 2 and 3 illustrate these results graphically. Although one psychosocial variable (coping) proved to be significantly associated with work status, overall, demographic and illness variables were most important. Because there were no significant relationships between stress, level of depression, and social support with job status, these variables were not shown in the figure.

After performing analyses of variance (ANOVA), we performed additional analyses using the Tukey Post Hoc test to explore differences between subgroups of the sample. The subgroups were compared using the Post Hoc test on age, symptom and diagnosis duration, FIS, and EDSS, all of which were found to have a significant relationship with job status in MS patients. Table 2 displays the significance of the each of the three groups compared to each other. Comparison of the three groups showed that the "not working" group differed significantly from the "working" and "cut back" group in the severity of disability. Similarly, the "working" group also differed significantly from the "cut back" and "not working" groups in level of fatigue and disease duration. One interesting finding from the Post Hoc test was that only the "working" group differed from the "not working" group in terms of age.

Table 1. Participant Characteristics

| Variable | Working M (SD) | Cut Back M (SD) | Not Working M (SD) | significance |
|---|---|---|---|---|
| Age** | 43.97 (9.07) | 47.33 (6.74) | 51.82 (8.17) | 0.002 |
| Years of Education | 14.60 (2.10) | 14.44 (2.03) | 13.79 (1.93) | 0.272 |
| Symptom Duration*** | 9.34 (6.86) | 16.72 (8.43) | 19.00 (7.47) | 0.000 |
| Diagnosis Duration** | 6.71 (6.15) | 11.72 (7.77) | 12.82 (6.69) | 0.001 |
| IQ Score | 105.88 (8.39) | 106.00 (10.0) | 104.28 (9.79) | 0.751 |
| Hassles | 42.97 (21.52) | 49.22 (21.17) | 43.28 (19.12) | 0.543 |
| Uplifts | 62.77 (24.04) | 57.27 (20.91) | 54.82 (17.15) | 0.321 |
| Hassles minus uplifts | -19.80 (30.98) | -8.05 (25.02) | -11.53 (18.82) | 0.239 |
| Ave supports listed per Q | 3.45 (1.61) | 4.33 (2.29) | 3.46 (1.94) | 0.247 |
| Ave satisfaction ranking per Q | 5.27 (0.83) | 5.52 (0.61) | 5.55 (0.55) | 0.255 |
| Composite support variable | 19.03 (10.15) | 25.82 (13.26) | 19.66 (11.96) | 0.133 |
| CDMI Mood and Evaluative combined t-score mean | 51.44 (11.40) | 54.69 (15.39) | 51.57 (12.08) | 0.640 |
| EDSS*** | 3.84 (1.43) | 4.25 (1.49) | 5.55 (1.45) | 0.000 |
| Education | 14.6 (2.10) | 14.44 (2.03) | 13.79 (1.93) | 0.272 |
| FIS total score** | 50.71 (27.56) | 72.66 (31.38) | 73.44 (23.31) | 0.002 |

*Note:* CDMI = Chicago Multiscale Depression Inventory Mood and Evaluative Subscales; EDSS = Expanded Disability Status Scale; FIS = Fatigue Impact Scale.
*p < .05; **p < .01; ***p < .001

Figure 1. Mean active-avoidance composite score by job status

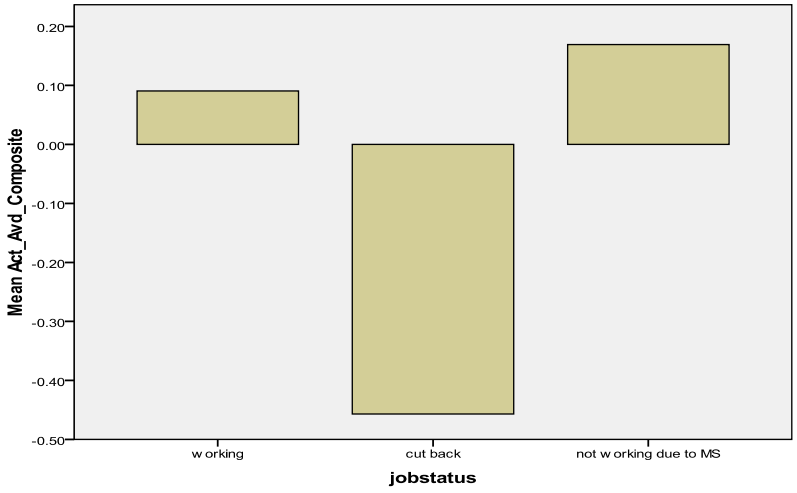

Figure 2. Mean Fatigue Impact Scale Score

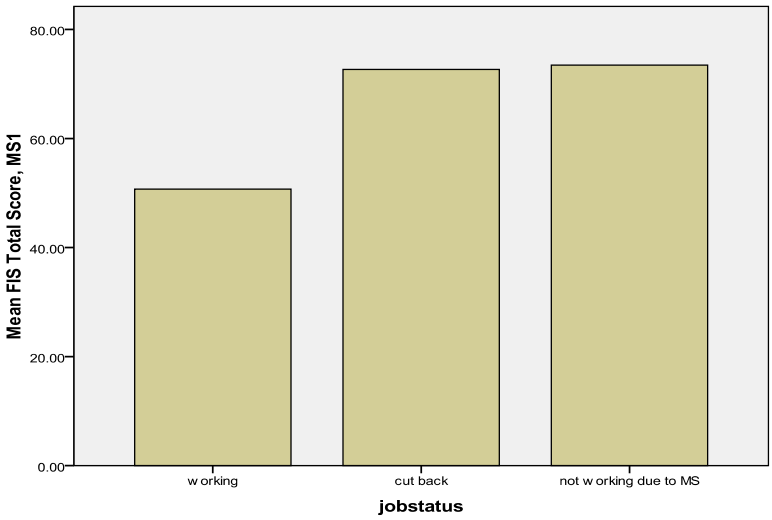


Figure 3. Mean Expanded Disability Status Scale

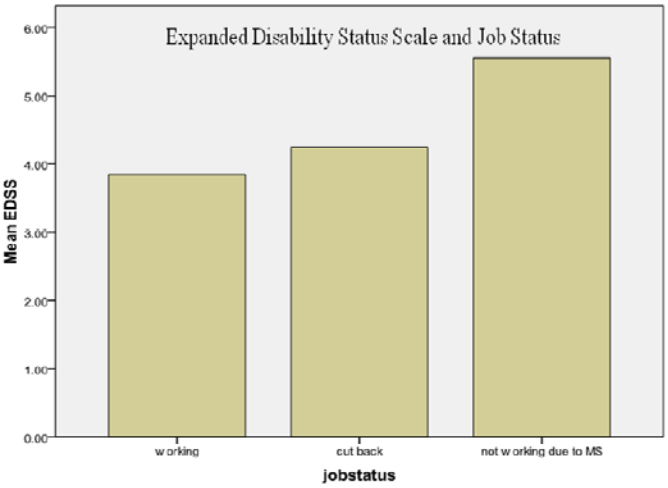


Table 2. Post Hoc test of significance between "working," "cut back," and "not working" groups

| **Variable** | **Job Status** |
|---|---|
| EDSS | NW →W, CB |
| FIS | W → CB, NW |
| Age | W → NW |
| Symptom Duration | W → CB, NW |
| Diagnosis Duration | W → CB, NW |

## Discussion

MS affects individuals as young as 5 and as old as 75 with patients most typically experiencing their first symptoms in the 20's and 30's. Approximately 400,000 people in America have MS, with 200 people diagnosed each week and 2.5 million people

worldwide affected (http://nationalmssociety.org/index.aspx). Although MS is not considered a fatal disease as people can still live with the disease, MS can affect people's daily functioning and decrease their life satisfaction tremendously. Some of the effects of MS include blurred or even loss of vision, fatigue, memory and concentration deficits, stress, and paralysis. All of these can lead to a decrease in the ability to perform daily activities such as caring for loved ones, going to work and caring for themselves.

Another important symptom of MS is depression. There are numerous studies that have shown that the prevalence of depression in MS is approximately 50% (Beeney & Arnett, 2008), which is a very high rate compared to only about 15% in the general population (http://cdc.gov/). The current study examined the employment status in MS patients and its relation to depression, stress, coping, and social support to explore possible contributors to and consequences of job status in MS. It was hypothesized that the MS group that was still working would report higher stress levels, more maladaptive coping, and lower levels of social support. Demographic variables in relation to job status were also examined.

In contrast to predictions, the groups did not differ on levels of depression, social support, or stress. However, the groups did differ in their coping strategies. Specifically, the "Cut Back" group used significantly more maladaptive coping compared with the other groups. One explanation for this could be that the "cut back" group was denying the fact that they have MS or they could be denying the fact that they need to stop working in order to manage their symptoms more effectively.

Some interesting demographic and illness differences between groups emerged. Compared with the "Working" group, the "Not Working" group was older, had a longer duration of disease, more neurological disability, and higher fatigue levels. In order to better understand how employment status affects these variables, we needed to control some of the variables that could change the results of the data by using Analyses of Covariance (ANCOVA) to test for between-subjects effects. The two variables that were analyzed using ANCOVA were FIS and EDSS. In the analyses of EDSS on job status, we found that group differences on the EDSS were significant even when we controlled for disease duration and age. In the second analysis of FIS on job status, we found that the FIS was not significant when we controlled for disease duration and age. This suggests that symptom duration and diagnosis duration might account for some of the differences in the job status group.

After controlling variables by ANCOVA analyses, we performed additional analyses in order to find out which of the three groups were actually significantly different from one another. To do this, we used the Tukey Post-Hoc test to explore differences among the "working," "cut back," and the "not working" groups. Analyses of these variables showed that there were group differences. In the analysis of the relationship between job status and EDSS, a significant difference between the "not working" group and the "working" and "cut back" groups was found. These results may reflect the fact that individuals with higher levels of disability ultimately had to quit working. In analysis of the FIS, it was found that the "working" group was significantly different from the "cut back" and "not working" group. As shown in Figure 2, the "working" group experienced significantly less fatigue compared to the "cut back" and "not working" groups. Lastly, analyses of the disease duration and job status showed that

the “working” group had significantly longer disease duration compared with both the “cut back” and the “not working” groups.

One interpretation of why the “not working” and “cut back” groups reported higher levels of fatigue is that fatigue may be a reflection of core disease burden and patients with greater disease burden were less likely to be working full time. In brief, their more advanced disease progression may have interfered with their ability to continue working full-time, or at all. Such an interpretation is consistent with the fact that the “working” group had lower EDSS scores and longer disease duration compared with the other groups.

Although one psychosocial variable (coping) proved to be significantly associated with work status, overall demographic and illness variables were most important. Awareness of these important demographic and disease factors associated with work status should help clinicians assist MS patients in making vocational decisions.

One implication of these research findings is that individuals’ coping strategies can potentially have a great influence on their health and wellbeing. As explained earlier, the “cut back” group was shown to report the use of more maladaptive coping compared with those who were still working full-time and those who were not working at all. One reason for this could be that individuals in the “cut back” group were denying their illness or denying the fact that they could not work. However, we do not know exactly what they were denying, and this is therefore speculative. Therefore, future research could invest in exploring why individuals in the “cut back” group report the use of more maladaptive coping compared to the working group.

Finding the root causes of the differences between job status groups across these variables can help prevent individuals with MS from having to quit working and it may help to improve their quality of life.

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# *Diffusion Barriers in Drosophila Neurons*

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*Abstract*

Neurons are highly specialized cells that require the specific localization of proteins within the cell to function. If the correct localization is compromised it can lead to neurological diseases. One of the proteins implicated in keeping proteins in their proper location is Ankyrin. Here we use RNAi to decrease the expression of Ankyrin 1 and 2 in Drosophila to see how it affects the axonal diffusion barrier in ddaE neurons. We are also creating a GFP and RFP of Rdl, a protein isolated to the dendrites, to view protein restriction in dendrites.

## Introduction

Neurons are highly polarized cells in both mammals and invertebrates. These cells are divided into three major subcellular compartments. Dendrites receive signals from either other neurons or the organism's environment. The cell body is where cellular processes take place, such as transcription and translation, and the axon relays the signal to the appropriate location. The proper function of these compartments in the neuron is dependent on the specific proteins present.

There are several ways that neurons can isolate proteins in specific compartments of the cell that help maintain the neurons proper function. Cells can keep proteins and phospholipids in a certain area by the use of cytoskeletal tethering. Also, there could be endocytosis that moves proteins and lipids into or out of areas the cell. Lastly, a diffusion barrier could exist that prevents diffusion across a specific point in the cell, similar to that of a tight junction (Winckler et al., 1999). It has been shown that rat hippocampal neurons form a diffusion barrier in the cytoplasm that prevents large macromolecules from entering the axon (Song et al., 2009). This same phenomenon has been seen in the plasma membrane of the axon initial segment (AIS) (Nakada et al., 2003; Winckler et al., 1999). Nakada was able to show that not only was there a decreased diffusion rate in the AIS but that the cytoskeletal protein ankyrin played a role in maintaining this barrier.

Ankyrin is vital to the proper function of the cytoskeleton and helps to anchor proteins to the cytoskeleton via a spectrin adaptor protein. Vertebrates contain 2 forms of

ankyrin, ankyrinB and ankyrin G. It has been shown that ankyrin G is expressed in the AIS and the accumulation of voltage-dependent channels as well as the initiation of the action potential is dependent on the presence of ankyrin G (Zhou et al., 1998). It also has been proposed that anchored protein pickets in the AIS prevent the diffusion and that ankyrin G is associated with the anchored protein picket (Nakada et al., 2003).

Drosophila have two forms of ankyrin, ankyrin 1 and ankyrin2. Ankyrin-1 is ubiquitous, where as ankyrin-2 is neuron specific. It has been shown that in Drosophila, the decreased expression of ankyrin-2 affected dendrite and axon morphology as well as the stability of presynaptic microtubules (Yamamoto et al., 2006; Pielage et al., 2008). There is no evidence that action potentials are initiated or that there exists an anchored protein picket in the AIS of Drosophila.

We hypothesize that ankyrin plays a role in maintaining a diffusion barrier in the plasma membrane of the AIS in Drosophila neurons. To test this hypothesis we used fluorescence recovery after photobleaching (FRAP) to show that mcd8-GFP freely diffuses in the cell body and does not recover in the axon of neurons of 3$^{rd}$ instar larvae. We go on to use ank1 RNAi and ank2 RNAi to see if ankyrin is one of the anchored membrane proteins responsible for the diffusion barrier in the plasma membrane of the AIS.

Also we are trying to create a fluorescent construct of a protein that is isolated to the dendrites. This is to try and look at a diffusion barrier in the dendrites in future studies. We are generating a green fluorescent (GFP) and red fluorescent protein (RFP) of the dendritic marker Rdl.

## Methods and Materials

### Fly Stocks and Crosses

The fly lines used in this study were Dicer2; 221 Gal4 mcd8 GFP/ TM6, ank1 RNAi on 2, ank 2 RNAi on 2, and rtnl2 RNAi on 2. All RNAi lines were purchased from VDRC. Males from each RNAi line were crossed to virgin female Dicer2; 221 Gal4 mcd8 GFP/ TM6, and third instar larvae from these crosses were collected on food caps after aging for three days and imaged by confocal microscopy.

### Confocal Microscopy

To view Drosophila larvae, whole third instar larvae were placed in a drop of Schneider's media on a dried agarose pad on a glass slide. The larvae were then positioned dorsal side up, and a cover slip was placed on top of the larvae. The cover slip was then taped down to the glass slide. Whole larvae were viewed immediately after mounting on a Zeiss 510 LSM microscope. Images were taken using a 63x oil objective lens and analyzed using Image J.

## Photobleaching

Fluorescence recovery after photobleaching (FRAP) was performed also using the Zeiss 510 LSM microscope and under the 63x oil objective used in confocal microscopy. A bleach scan with the laser at full power with a time frame of two or three seconds was used for all experiments. Quantification of all movies was done using the Image J program. The intensity of a small area of the bleached region was taken as well as the intensity of a small area of the unbleached region. Background intensity was then subtracted from the values of the bleach and unbleached areas. The ratio of the resulting values of the bleached to unbleached region was then taken. This value was then divided by the initial prebleach ratio to correct for the bleaching affect of the laser.

## Generation of Rdl-GFP and RFP Constructs

Rdl-GFP and Rdl-RFP constructs were generated by amplifying an Rdl EST (DGRC) by PCR with Bgl II and Not I primers. The Rdl DNA was cloned into pUAS-TDC, the RFP construct, and pUAS-EMC, the GFP construct, vectors that were digested with Bgl II and Not I restriction enzymes. The resulting plasmid will be inserted into the Drosophila genome via P-element insertion.

# Results

## A Diffusion Barrier Exists in the Proximal Portion of the Axon and not in the Cell Body or the Dendrites

It has been shown that a diffusion barrier exists in the AIS of mammalian neurons, but not invertebrates (Nakada et al., 2003; Song et al., 2009; Winckler et al., 1999). Thus, we looked into if there is a diffusion barrier in the AIS of the Drosophila motor neurons by using FRAP on larvae expressing a green fluorescent protein (GFP) tagged to the protein mcd8. Mcd8 is a protein that exists in both the plasma membrane and the endoplasmic reticulum (ER) in the cell body but only the plasma membrane in the axon and dendrites (Fig. 1B). Rtnl2 RNA interference (RNAi) was used because the RNAi would inhibit the production of rtnl2, which has no known function. This would allow the diffusion of mcd8-GFP to be accurately measured because the loss of rtnl2 would not have an affect on the mobility of mcd8-GFP in the plasma membrane. The 221 Gal4 driver was used to express the mcd8-GFP in dendritic arborization neurons. Dicer2 is a transgene that was also used to promote the RNAi expression in the larvae.

To get a baseline for the diffusion of mcd8 in neurons, FRAP was done on the cell body of class 1 dorsal dendritic arborization neurons, ddaE, in 3$^{rd}$ instar larvae. A small area of the cell body was bleached and the recovery was measured. A full recovery of the area was observed, after normalizing for the bleaching affect of the laser (Fig. 1A-D). There is an almost 100% recovery after approximately 50 seconds after bleaching. This shows that mcd8-GFP diffuses in the cell body of ddaE neurons at a constant rate and is not inhibited from entering an area of the cell body.

The same experiment was done on the proximal part of the axon to see if it would recover as well. When this was done there was recovery of the axon of about 20% (Fig. 1E-H). This shows that mcd8 does not diffuse as freely into the proximal part of the axon from either the cell body or the distal portion of the axon and that there is a diffusion barrier in AIS of ddaE neurons. This provides evidence that there is a diffusion barrier similar to that of mammals present in 3rd instar larvae ddaE neurons.

Next FRAP was done on the dendrites of ddaE neurons to see if the same diffusion barrier that was seen in the proximal axon exists in the proximal dendrite. After bleaching the proximal dendrite, there was an almost full recovery of the mcd8-GFP (Fig 1I-L). Thus there is a diffusion barrier in the AIS of Drosophila but not in the dendrites. It is interesting to note that there was a slower diffusion of mcd8-GFP in the dendrite than in the cell body. This could be because mcd8-GFP diffuses slower in the plasma membrane than in the ER, which is where mcd8-GFP is present in the cell body.

## Ankyrin Plays a Role in Maintaining the Diffusion Barrier in the Axon Initial Segment in ddaE Neurons

The next step was to determine how this diffusion barrier is maintained. It has been previously shown that Ankyrin is a protein associated with the diffusion barrier in the axon initial segment of rat hippocampal neurons, which makes it a logical choice to see if it also has an affect on axon initial segment in Drosophila (Nakada et al., 2003). To test if ankyrin is associated with the diffusion barrier in the AIS of Drosophila, an ankyrin loss of function experiment was done. The AIS of ank1 RNAi and ank2 RNAi third instar larvae ddaE neurons were bleached in the proximal portion of the axon. These RNAi lines were also crossed to the Dicer2; 221 Gal4 mcd8 GFP/ TM6 as in the previous experiment.

When the same axon bleach experiment done in the rtnl2 RNAi is done in larvae with ank1 RNAi, only 1 of 3 images show a possible affect of the RNAi. The graph shows a steady increase and a recovery of approximately 50% (Fig. 2A) This is difficult to see in the images because of the imaging conditions were not ideal because the axon was to dim and bleached out to quickly during imaging, but this image provided evidence that ank1 plays a role in maintaining a diffusion barrier in the AIS.

Photobleaching the AIS in larvae with the ank2 RNAi also showed some recovery, similar to that in larvae with Ank1 RNAi. 4 of 9 larvae show a recovery of 40% to 50% after photobleaching of the AIS (Fig. 2B). This also provides evidence that ankyrin maintains the diffusion barrier in the AIS of Drosophila.

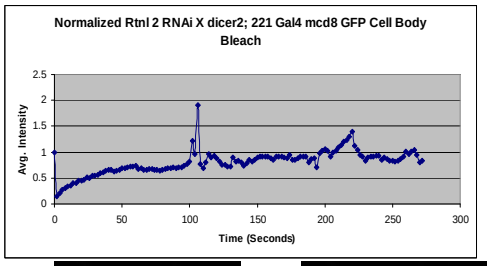
## Generating a Rdl-GFP and Rdl-RFP Construct

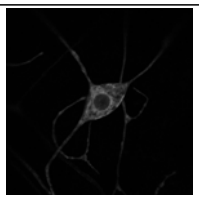
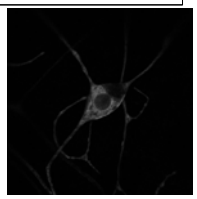
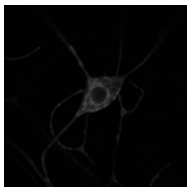
Rdl, stands for resistant to dieldrin, was first identified as an insecticide resistant neurotransmitter receptor (ffrench-Constant et al., 1993). It is isolated to the dendrites of motor neurons, and the purpose of this project is to make a transgenic fly line via p-element insertion that expresses either a green fluorescent protein (GFP) or red fluorescent protein (RFP) of the rdl (Sanchez-Soriano et al., 2005). The rdl gene is

placed in between two p-element ends in a plasmid and injected into an embryo in the presence of another plasmid with a transposase gene. The rdl gene will then be randomly transposed into the Drosophila genome by the transposase and expressed under the 221 Gal4 driver for use in future experiments.

Figure 1.

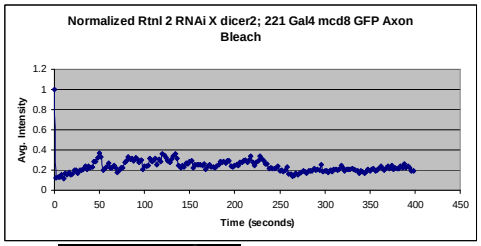
1A.

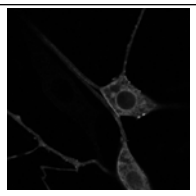
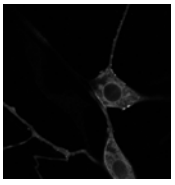
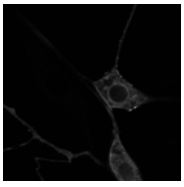



1B.  1C.  1D. 

Pre-Bleach Post-Bleach 50 seconds

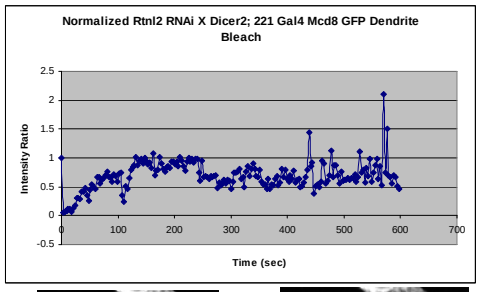
1E.

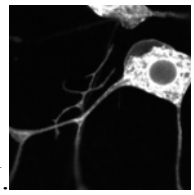
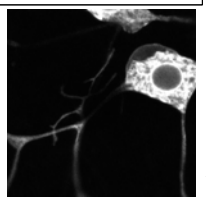
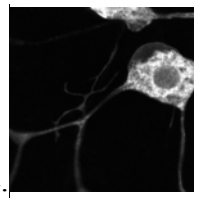



1F.  1E.  1F. 

Pre-Bleach Post-Bleach 50 seconds

1I.

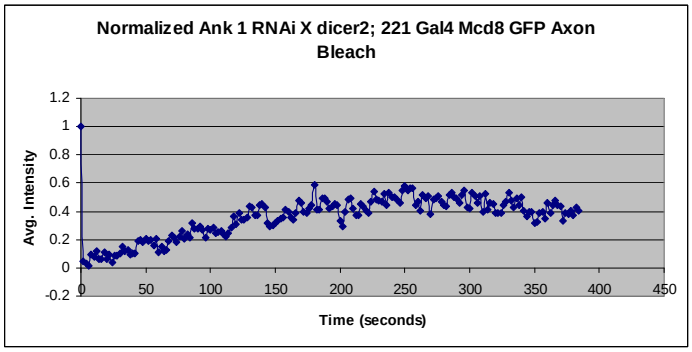


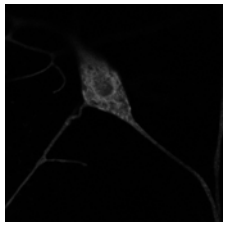

1J.  1K.  1L. 

Pre-Bleach Post-Bleach 50 seconds

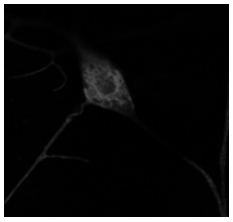
Figure 2.

2A.

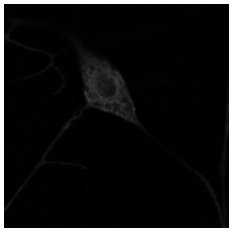



2B. 

Pre-Bleach

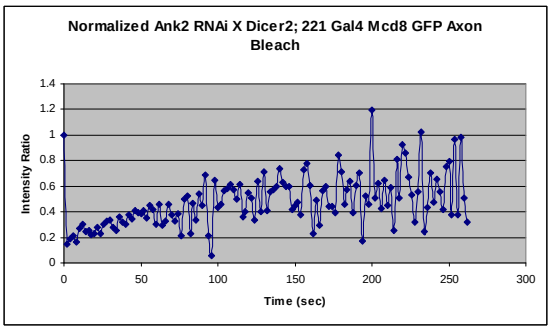
2C. 

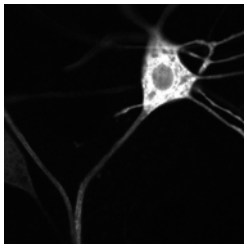
Post-Bleach

2D. 

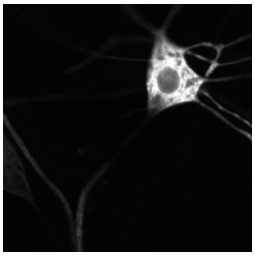
150 Seconds

2E.

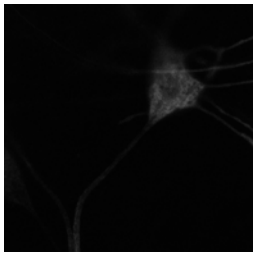



2F. 

Pre-Bleach

2G. 

Post-Bleach

2H. 

150 seconds

## Discussion

By using FRAP experiments on the axon, cell body, and the dendrites, we have shown that a diffusion barrier exists in the plasma membrane of axons in Drosophila ddaE neurons and not in the cell body. It was observed that diffusion was slower in the dendrites then in than in the cell body. This could be from the fact that a longer region of the dendrite was bleached compared to the area bleached in the cell body. The longer diffusion rate could also be because that diffusion is slower in the plasma membrane than in the ER. Mcd8-GFP is present in the ER and plasma membrane in the cell body but only present in the plasma membrane in the dendrites. If mcd8-GFP naturally diffuses faster in the ER than in the plasma membrane, it could explain this difference.

Our experiments with the ankyrin RNAi as of yet are not conclusive because it is difficult to see in the videos whether it is membrane diffusion that is being measured or vesicular trafficking. The imaging conditions need to optimized to better show the axon and minimize bleaching over time span of the imaging. There is evidence to show that ank1 and ank2 may play a role in the diffusion barrier in the AIS, but more research needs to be done. Another RNAi line that needs to be looked at is ank1 RNAi with the ank2 RNAi to view its affect on the diffusion barrier in the AIS. It is hypothesized that the loss-of-function of ank1 RNAi and ank2 RNAi will further decrease the diffusion barrier in the AIS and the diffusion of mcd8-GFP will begin to look more like that of dendrites. This is the current hypothesis because both forms of ankyrin seem to have similar effects when one is depleted from the larvae and when both are depleted from the larvae the affects will be more pronounced.

Currently the Rdl-GFP and Rdl-RFP are not completed. The rdl DNA that has been inserted into the RFP construct plasmid, pUAS-TDC, and is being sequenced to ensure that no mutations have occurred over the process. We are in the process of isolated the GFP construct plasmid, pUAS-EMC, so that the rdl DNA can be inserted into it. Once one of the clones has been sequenced and shows no mutations, the rdl DNA that has been inserted into a p-element vector will be injected into embryos with a plasmid containing transposase. This rdl gene with the GFP or RFP tagged on the C-terminus, to not interfere with the function of rdl, will be inserted into the Drosophila genome. This will cause Drosophila larvae to express either rdl-GFP or rdl-RFP once combined with the Gal4 driver.

This data shows that Drosophila do contain a diffusion barrier in the AIS of ddaE neurons. This is relevant because it shows that the Drosophila nervous system is more similar to mammalian nervous system then previously thought. We can use Drosophila to understand how ankyrin loss could affect the nervous system of the organism. It was previously mentioned that loss of AnkG in mammals could cause neurodegenerative diseases because it causes the axon to exhibit dendritic properties (Hedstrom et al., 2008). This evidence provides a jumping point for further research into this topic in Drosophila.

Acknowledgments

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# *In the eye of the beholder: Attachment style differences in emotion perception*

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*Abstract*

Attachment theory refers to the relationships individuals develop with caregivers or significant others in their lives. Specifically, adult attachment is concerned with the bond that develops between romantic partners, as categorized by four different adult attachment styles: Secure, Preoccupied, Dismissing, and Fearful. This study seeks to examine the role that adult attachment style might play in the perception of emotion in others, and whether there are individual differences in emotion perception accuracy among the different attachment styles in a sample of undergraduate college students. Based on previous research, the hypothesis was that Preoccupied individuals would show increased accuracy at perceiving emotions in others, while Dismissing individuals would show decreased accuracy at perceiving emotions in others. Attachment styles were determined through the use of the Experiences in Close Relationships-Revised inventory (ECR-R), and emotion perception accuracy was assessed using the Reading the Mind in the Eyes Task (RMET). Results indicated that while Preoccupied individuals did have increased accuracy and Dismissing individuals had decreased accuracy at perceiving emotions, this finding was confined to negative emotions. One proposed explanation for this finding is that a bias exists for Preoccupied and Dismissing individuals, and future research is suggested.

## Introduction

"Beauty is in the eye of the beholder", as the saying goes. While this does have a more romanticized meaning, this saying is also a case-in-point for one of the fundamental aspects of the field of psychology: individual differences. "Individual differences" refer to the disparity that exists between the minds of human beings. For example, individual differences explain why certain individuals are more intelligent than others, or why two individuals might disagree about what's attractive (thus, "beauty" is not a definitive term, but is instead open to interpretation). Individual differences are not always understood, however, and researchers are constantly trying to explain the vast amount of differences that exist (Tyler, 1965). This study is also concerned with individual differences, and seeks to explore the individual differences that exist in the perception of emotion in others.

Emotion researchers have noted marked differences in how accurate individuals are at decoding the emotional states of others, especially across cultures and in disordered individuals (Borod, Martin, Alpert, Brozgold, & Welkowitz, 1993; Ekman, Sorenson, & Friesen, 1969; Ekman & Oster, 1979; Gessler, Cutting, Frith, & Weinman, 1989; Masuda et al., 2008; Matsumoto & Ekman, 1989; Meyer, Pilkonis, & Beevers, 2004; Wagner & Linehan, 1999). Paul Ekman and Wallace Friesen identified six universal emotions that most individuals are able to read easily and accurately: Happiness, Sadness, Surprise, Fear, Anger, and Disgust (Ekman & Friesen, 1969). However, there are many more emotional states in the spectrum of human emotion, and more complex emotions are not always readily identified. Often, there are clues as to the emotional state of others, such as facial expressions, body language, gestures, and even eye gaze (Adams & Kleck, 2003, 2005; Ganel et al., 2005; Graham & LaBar, 2007; Sander et al., 2007). It is these clues that allow us to make a judgment about the emotion that another person is currently feeling, and to then act accordingly. However, humans are not always correct in their judgments, and errors can be made. For example, an individual who is crying would typically be perceived as sad, though that individual could also be crying out of joy or even anger. In this instance, trying to cheer the individual up is not always the best course of action, even though it might be one's first instinct.

The Theory of Mind is one way to help explain these individual differences in emotion perception. Theory of Mind is defined as the ability to attribute thoughts and feelings to the self and others (Premack and Woodruff, 1978). Infants are capable of following eye-gaze direction in others at around 6 months (Baron-Cohen, 1995), and are able to recognize and attribute desires other than their own to others around age two (Baron-Cohen, 1993). Since this is an ability that has ample time to fully develop, it can become finely-tuned to subtle emotional cues. Based on this theory, it follows that if an individual differs in any way from what is considered "normal emotion", then their ability to accurately perceive emotions in others will also be abnormal. This theory has led researchers to explore the role that psychological disorders can play on emotion perception, as these disorders often result in difficulty managing one's own emotions, and many of these researchers have found that impaired social judgment is often a basic symptom of psychological disorders, such as autism, schizophrenia, or borderline personality disorder (Bateman & Fonagy, 2003; Bender & Skodol, 2007; Borod et al., 1993; Davies, Bishop, Manstead, & Tantam, 1994; Gross & Munoz, 1995; Hobson, 1986; Kerr & Neale, 1993; Levy, 2005; Levy et al., 2006; Mennin, Turk, Heimberg, & Carmin, 2003; Ozonoff, Pennington, & Rogers, 1990; Schultz, 2005; Westen, 1991). These findings suggest that abnormal development does indeed play a role in the accuracy of emotion perception, and has led researchers to explore other factors that might not be associated with a clinical disorder, such as attachment style.

Attachment Theory was developed by John Bowlby (Bowlby, 1969; Bowlby, 1973; Bowlby, 1980), a researcher who was interested in examining the distress infants and toddlers displayed when separated from their caregivers. His theory states that children develop bonds with their caregivers which cause the children to become "attached" to them. When a child is separated from its mother, the child exhibits certain attachment behaviors, such as crying, searching for the mother, or vocal signaling. He postulated that this served an adaptive purpose, as infants are unable to care for themselves, but are instead dependent on their parents, which leads them to develop an attachment bond with their parents to avoid separation (Bowlby, 1969; Bowlby, 1973; Bowlby, 1980). However, a student of Bowlby's, Mary Ainsworth, noticed that not all children behaved the same way after being separated from their caregivers. To try and

explain this individual difference, she designed an experiment known as the Strange Situation (Ainsworth et al., 1978; Ainsworth, 1985). During the Strange Situation, infants are separated from their mothers for a period of time, and are observed by researchers who note the child's reactions to their mother's departure. When the mother returns, the infants are again observed to see how they react to being reunited with their caregiver. Ainsworth noted that there were three distinct styles of attachment that the infants exhibited: Secure, Anxious-Resistant, and Avoidant (Ainsworth et al., 1978). Secure infants were distressed by their mother's departure, but were easily consoled upon her return. Anxious-Resistant infants are extremely distressed by their mother's departure, and are not easily consoled even when she returns. Avoidant children are not distressed by their mother's departure, and ignore their mothers when they return. In recent years, a fourth attachment style has also been proposed, known as Disorganized (Main & Solomon, 1990). Disorganized infants lack a coherent strategy for coping with separation from their mother, and seem confused.

Based on this attachment theory, researchers began to question whether or not these attachment styles remained throughout the course of an individual's life. In 1987, Cindy Hazan and Phil Shaver examined attachment between romantic partners (Hazan & Shaver, 1987). They found that like infant attachment, romantic partners exhibit many of the same attachment behaviors with each other. This has led to the development of the Adult Attachment Theory, which states that adults develop bonds with their romantic partners in much the same way as infants do with their caregivers.

Like infant attachment, adult attachment has been separated into four distinct categories: Secure, Preoccupied, Dismissing, and Fearful (Bartholomew & Horowitz, 1991). Secure adults are comfortable with intimacy and independence, and report greater relationship satisfaction than the insecure attachment styles. The Secure attachment style is considered the "healthiest" of the four adult attachment patterns. Preoccupied individuals have a strong desire for intimacy, and are distressed by independence. Preoccupied adults are often "clingy", mistrustful of others, and highly expressive of their own emotions. Dismissing individuals have a strong desire for independence at the expense of intimacy. Dismissing adults suppress their own emotions, and can consider relationships unimportant, since they often consider their romantic partners to be less important. Fearful individuals are uncomfortable being emotionally close in relationships, even though they desire intimacy. Fearful adults often have trouble initiating or maintaining relationships with others due to this mixed behavior.

Adult attachment was originally measured categorically, with measures asking subjects which of the four styles most closely matched their own personality (Hazan & Shaver, 1987). However, recent research has shown that adult attachment is better assessed dimensionally rather than categorically (Brennan, Clark, & Shaver, 1998; Fraley & Waller, 1998). In other words, modern measures of adult attachment attempt to measure subjects' scores along a scale, which can then be used to place subjects into individual attachment styles. Kelly Brennan, Catherine Clark, and Phil Shaver developed the Experiences in Close Relationships inventory, or ECR, which assesses subjects along two scales: anxiety and avoidance (ECR; Brennan, Clark, & Shaver, 1998). The ECR measures subjects' scores on both scales, which can then be used to assess attachment style based on a four-quadrant model of adult attachment (see Figure 1). Secure individuals have low anxiety and low avoidance, Preoccupied individuals have high anxiety and low avoidance, Dismissing individuals have low anxiety and high avoidance, and Fearful individuals have high anxiety and high avoidance.

The research that has been conducted on the role of attachment in emotion perception has been mixed, and a general consensus has yet to be reached (Fraley et al., 2006; Levinson & Fonagy, 2004; Meyer et al, 2004; Niedenthal et al., 2002). A possible explanation for this is that the measures of emotion perception vary widely. One of the most popular methods of assessing emotion perception is by using facial expression recognition. Facial expression recognition relies on the ability of individuals to decode the mental states of others based on facial cues, such as smiling, frowning, raising the eyebrows, exposing the teeth, etc., from photographs of different faces. While facial expression recognition tasks are reliable and valid measures of emotion perception, they tend to be rather easy for the majority of so-called normal individuals (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). This can create a ceiling effect, which can prevent researchers from obtaining a true measurement of ability. For example, if someone who has average emotion perception skills can still manage to get every item correct on a facial expression recognition task, then someone who has above-average emotion perception skills will not be able to be differentiated from those with average abilities.

In an attempt to overcome this problem, a new emotion perception task was developed, known as the Reading the Mind in the Eyes Task. The Reading the Mind in the Eyes Task, or RMET, was developed by Simon Baron-Cohen and colleagues in order to assess individuals' abilities to pick up on subtle emotional cues (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). The RMET is based on the premise of perceiving emotional states in others through the eyes, and evidence has shown that humans are capable of accurately decoding complex emotional states from the eyes of others (Baron-Cohen, Wheelwright, & Jolliffe, 1997), and not just the six basic and universal emotions (Ekman & Friesen, 1969). The RMET consists of a series of sectional photographs of human faces, specifically the eye region. The task asks participants to identify which emotion each photograph is displaying based on 4 emotional descriptors. Since the photographs display complex emotional states, as opposed to basic ones, it is dependent on participants' attention to subtle cues, which can make it a more difficult measure. This increase in difficulty will eliminate the ceiling effect experienced when using facial expression recognition tasks. Because of this, the RMET can be a more accurate measure of emotion perception than measures that incorporate the entire face.

The current study seeks to examine the role that attachment plays in emotion perception using the RMET. Based on previous research, it was hypothesized that security of attachment (Secure individuals) as compared to insecurity (Preoccupied, Dismissing, and Fearful individuals) would show greater overall accuracy at the RMET. It was also hypothesized that Dismissing individuals would show worse accuracy with negative emotion, while Preoccupied individuals would show greater accuracy with negative emotion. The logic for the first hypothesis relies on the fact that Secure individuals are considered the healthiest in terms of regulating their own internal emotions, which according to the Theory of Mind, would make them the healthiest in terms of perceiving emotions in others. The logic for the second and third hypotheses relies on the fact that Dismissing individuals would be less perceptive of negative emotion due to their tendency to brush off negativity in others, as a kind of defense mechanism (Levinson & Fonagy, 2004). Preoccupied individuals, on the other hand, would be more perceptive of negative emotion, due to their tendency to always be on the lookout for the worst in others.

## Methods

*Participants*

Participants were made up of a group of 232 students from a large northeastern university, and were selected through a psychology subject pool for an introductory psychology course. In exchange for participating, students received credit towards their research participation requirement for the course. Of the 232 participants, 66% were female, 82% were Caucasian, and all participants were between the ages of 18 and 39, with a mean age of 19. A total of 17 infrequency items were included with the measures, and some participants were excluded from analysis based on their responses to these infrequency items. The infrequency items included questions such as "I walk with a limp due to a skydiving accident" and "I have never combed my hair before going out in the morning". Participants were excluded if their responses to these infrequency items were outside the norm for more than three items. Eight participants were excluded based on this method, leaving the sample with 224 participants. Further justification for their exclusion was found by examining the self-report measures from these eight, which seemed to suggest carelessness or inattentiveness in answering (answering the same thing for every question, or answering inconsistently on similar questions).

*Measures*

*ECR-R*. The Experiences in Close Relationships-Revised Adult Attachment Questionnaire is a 56-item measure of attachment related anxiety and attachment related avoidance (Fraley, Waller, & Brennan, 2000). Internal consistency reliability is about .90 for the ECR-R, making it a reliable and valid measure (Sibley & Liu, 2004; Lancee, Maunder, Fraley, & Tannenbaum, 2004). The ECR-R is designed to assess personal experiences in romantic relationships with regards to anxiety and avoidance. There are 28 items to assess anxiety, and 28 for avoidance. Sample items include "I rarely worry about being abandoned" and "I am afraid I will lose my partner's love". Each item was presented on a 7-point Likert scale, with a 1 being "Strongly Disagree" and a 7 being "Strongly Agree". Continuous scale scores were calculated for each of the two subscales from the averages of their corresponding items.

*Experimental Tasks*

*Reading the Mind in the Eyes Task (RMET).* The RMET is a 36-item measure of emotional perception (Baron-Cohen et al., 2001). Subjects are presented with black-and-white stimuli (photographs) of the eye region of faces (i.e., from the nose to the brow). Stimuli were presented in the center of a computer screen, with a white background (see Figure 2). Stimuli were preceded by a fixation cross, and accompanied by four mental state descriptors (e.g., "Contemplative", "Suspicious", "Amused", "Annoyed"). Since there is only one target, the other three descriptors serve as distracters. All four descriptors were positioned in the four corners of the computer screen, and were equidistant from the center. Subjects are asked to select one of the four descriptors by pressing the corresponding number key (1, 2, 3, or 4), which records their responses and triggers the next photograph. All 36 photographs were randomly presented, and subjects' choices and response times (in milliseconds) were recorded by the computer program.

*Classification of Stimuli.* A pilot study was conducted to determine emotional valence of the RMET stimuli. 40 undergraduate students rated each of the photographs on a 7-point scale, with 1 being very negative and 7 being very positive. This data was used to classify all of the 36

RMET stimuli as positive, negative, or neutral. This was then used to examine the accuracy of the participants in the current study, who were also asked to rate the photographs by emotional valence.

Each of the 36 stimuli were presented one at a time in the center of the computer screen with a white background, in random order. Stimuli with mean ratings significantly below neutral were classified as negative; stimuli with mean ratings significantly above neutral were classified as positive; stimuli with mean ratings that did not differ from neutral were classified as neutral (Harkness et al., 2005). The result was 10 negative stimuli, 17 neutral stimuli, and 9 positive stimuli. RMET accuracy scores were calculated as the percentage of items in a particular valence where subjects chose the correct descriptor. RMET response times were calculated as the average response time in each valence category.

*Procedure*

Subjects were asked to come in to the laboratory in groups of one to four people for the administration of the experiment. Subjects were briefed on the purpose and content of the study, and asked to provide written informed consent. They were then seated at separate desks and asked to fill out the ECR-R. After completing the questionnaire, subjects were provided with separate computers for the RMET. Once the RMET was finished, subjects were thanked, debriefed, and dismissed.

## Results

Analyses were conducted using SPSS 17.0 (SPSS Inc., Chicago, IL). Using multiple regression analyses, attachment anxiety and avoidance were examined as predictors of interpersonal accuracy in facial emotion recognition. Avoidance and anxiety were independent variables, while accuracy was the dependent variable. Four types of emotion recognition variables were examined: overall accuracy (which included composite positive, negative, and neutral valence scores), positive accuracy, negative accuracy, and neutral accuracy.

For overall accuracy, variables were entered simultaneously, and findings indicated that neither attachment anxiety nor attachment avoidance predicted accuracy on the RMET. In other words, anxiety was unrelated to overall accuracy ($\beta = .002$, $p = .715$), as was avoidance ($\beta = .001$, $p = .896$). These results suggest that overall, there is no relationship between attachment style and accuracy in emotion perception.

For negative emotions, variables were entered simultaneously, and findings indicated that attachment anxiety positively predicted enhanced emotion recognition in negative emotion conditions, which was significant at .1 level ($\beta = .015$, $p = .099$). Avoidance was negatively related to recognition of negative emotion states, such that the more avoidant the participant was, the worse their accuracy score was for detecting negative emotions. This relationship was also significant at a .1 level ($\beta = -.018$, $p = .087$). Results for emotional valences other than negative failed to show any significant results.

From these results, it follows that highly Preoccupied participants are more accurate on the RMET than highly dismissing participants. Fearful and Secure participants do not differ significantly, and fall somewhere between Preoccupied and dismissing participants with respect to RMET accuracy. This effect is thus driven by both the anxiety and avoidance dimensions. This pattern can be referred to as "hyperactivating vs. deactivating", as Preoccupied participants hyperactivate and dismissing participants deactivate with regards to emotion perception.

## Discussion

The results partially supported my hypotheses. While there was no difference in emotion perception accuracy between the attachment styles with regards to overall accuracy, insecurely attached Preoccupied individuals had better accuracy on the RMET than the other three groups with regards to negative emotion, and insecurely attached Dismissing individuals had worse accuracy on the RMET than the other three groups with regards to negative emotion. However, there were no significant differences between the four groups' accuracy for neutral or positive stimuli. In other words, the more anxious and less avoidant individuals are with respect to attachment, the higher their accuracy will be at perceiving negative emotions in others.

This finding is consistent with the "Hyperactivating vs. Deactivating" theory, in that the hyperactivating Preoccupied individuals are going to be more aware of the emotional states of others, while the deactivating Dismissing individuals are going to be more likely to ignore the emotional cues from others. However, since this seems to only be the case for negative stimuli, it is likely that there is another factor at work. This could be due in part to a general tendency by Preoccupied individuals to distrust the intentions of others, which would lead them to choose more negative emotion words on the RMET as a rule. Naturally, if Preoccupied individuals have a tendency to choose negative responses, they are going to be much more accurate on the negative stimuli than others. Likewise, Dismissing individuals are highly independent and more aloof than the other attachment styles, a characteristic that in relationships helps them cope with rejection or negative emotions in a neutral and uncaring fashion, as a kind of defense mechanism. For example, if a Dismissing individual was involved in a fight with a significant other, he/she would ignore the negative emotions that the significant other would be exhibiting out of the Dismissing tendency to remain relatively detached from the emotional closeness that would lead the Dismissing individual to feel hurt by the negativity from his/her significant other. This tendency would mean that Dismissing individuals would ignore the negative cues from the RMET, and tend to pick more neutral responses instead. This is further supported by the fact that the results show a slight tendency, albeit not a significant one, for Dismissing individuals to perform better on neutral stimuli, and Preoccupied individuals to perform worse on neutral stimuli. Once again, this could be due to the Dismissing tendency to choose more neutral responses because Dismissing individuals would ignore negative cues, and Preoccupied individuals would perform worse on neutral stimuli out of the Preoccupied tendency to distrust the intentions of others, resulting in a sense that neutral faces harbor an ulterior motive.

The study was not without limitations, however, due to the nature of the methodology. The participants were all college students recruited through a university subject pool, and students were receiving course credit for participation. Credit was awarded for each student based on whether or not the student was present during the administration of the study, not on whether they read all the measures carefully and responded accurately. Because of this, it is possible that not all the students who participated in the study responded honestly or performed to the best of their ability. The infrequency items were also only included in the measures for roughly half of the participants (the later half) in an attempt to provide a method of checking for reliability, and the first half of participants run through the study were without these items. It should also be noted that the use of infrequency items to exclude participants from analysis is not a flawless system.

The implications of this study are important for relationship research. Preoccupied individuals, who are hyper-vigilant of negative emotions in others, will likely experience

difficulties in romantic relationships, as they will be more acutely aware of their partner's negative emotions than positive or neutral ones. This could potentially lead to a more chaotic and contentious relationship, marked by frequent fights. Likewise, Dismissing individuals could experience problems in their relationships due to their tendency to ignore negative cues, which could create communication problems with their partners. For example, a Dismissing individual might ignore his/her partner's cues about a negative emotion the partner might be feeling, which could cause the partner to think that the Dismissing individual is ignoring them altogether.

Further research is suggested, and indeed required, in order to determine the true nature of this relationship between attachment and emotion perception. In order to determine if the theory that the differences in accuracy for negative stimuli is accounted for by a bias instead of an actual advantage, it is necessary to continue this research by considering the error choices of each participant to determine whether such a bias exists. For example, if a participant identified as having a Preoccupied attachment style consistently chooses more negative choices for all the RMET stimuli, and not just for the negative ones, then it is likely that the increased accuracy on negative stimuli is due to a negativity bias. The same is true for Dismissing individuals, who would tend to choose more positive error choices for all stimuli. It is also worth considering the role of Borderline Personality Disorder (BPD) in this relationship, as BPD and insecure attachment are closely linked (Fonagy et al., 1996; Meyer, Pilkonis, Proietti, Heape, & Egan, 2001; Patrick, Hobson, Castle, Howard, & Maugham, 1994; Rosenstein & Horowitz, 1996; Stalker & Davies, 1995). In particular, most borderline individuals fall into the Preoccupied attachment category, and past research has shown that borderline individuals do indeed appear to have a negativity bias (Nigg, Lhor, Westen, Gold, & Silk, 1992; Arntz & Veen, 2001; Domes et al., 2008; Meyer et al., 2004; Wagner & Linehan, 1999).

While not perfect, this study has shown that there does appear to be a relationship between attachment style and emotion perception in others. With further investigation, it is possible to shed even more light on the nature of this relationship, which could help shape both attachment theory and relationship research in the future. The results are intriguing, and it would be very interesting to see if the relationship could attain greater significance with more power. With more research, I believe that it will be possible to predict accuracy in emotion perception using only an individual's attachment style, a theory which without a doubt warrants further exploration. Though the saying is that "beauty is in the eye of the beholder", there is something to be said about emotion being in the eye of the beholder, as well.

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*Figure 1.* ECR anxiety-attachment scale four-quadrant model.

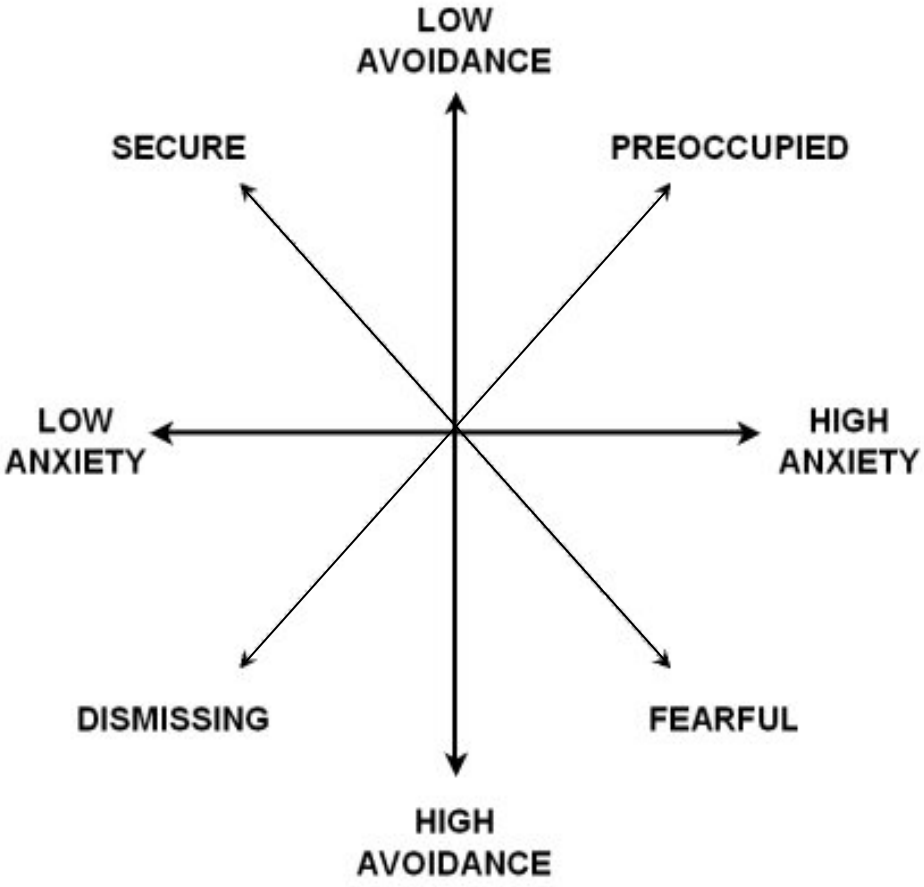
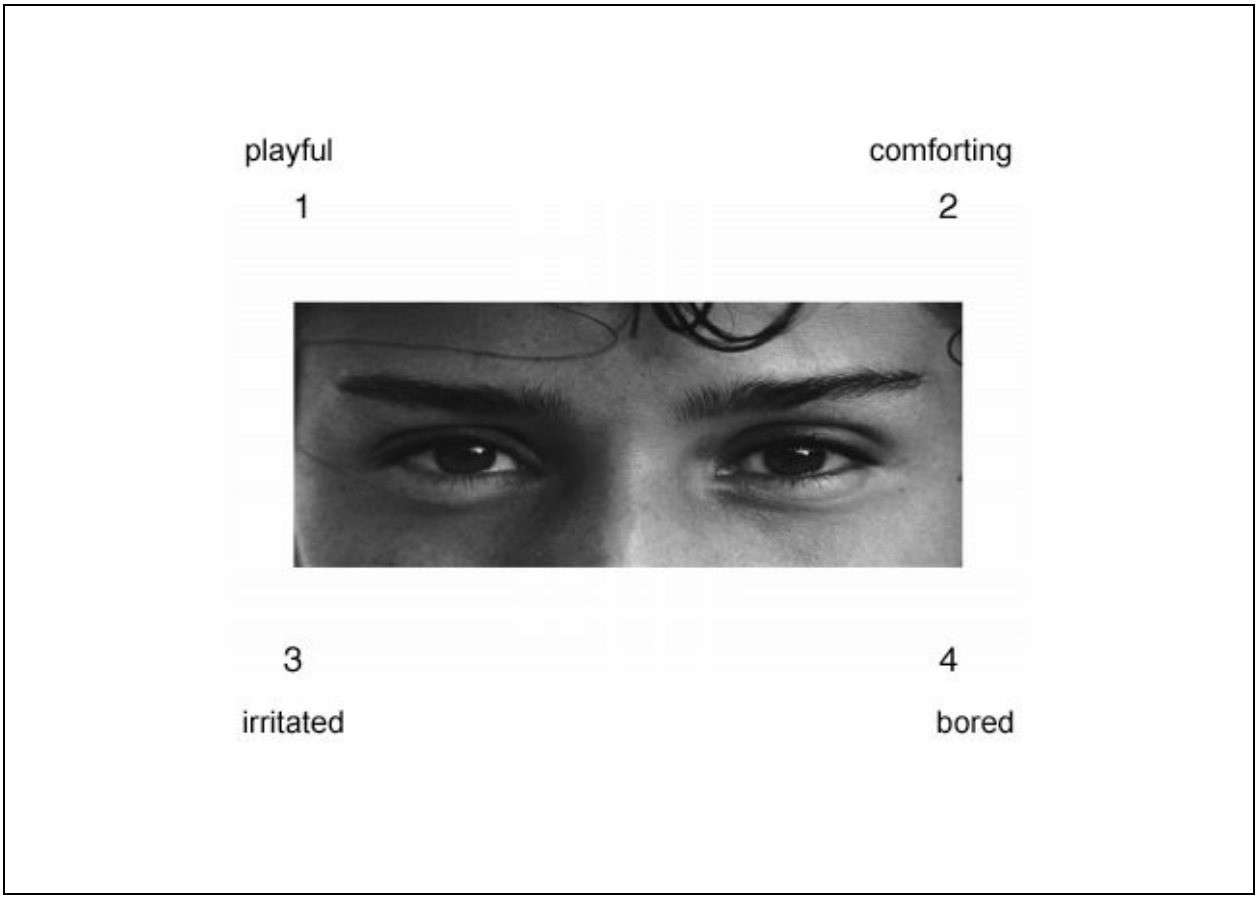


*Figure 2.* Sample item from the RMET (*playful* is the target response).



# Bisphosphonate Effects on Breast Cancer Colonization of Three-Dimensional Osteoblast Tissue

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## ABSTRACT

**The purpose of this study was to characterize the effect of zoledronic acid (a bisphosphonate used clinically to treat bone metastasis) on osteoblasts and a model of breast cancer metastasis to bone *in vitro*. Murine calvarial pre-osteoblasts (MC3T3-E1) were grown to various stages of maturity in tissue culture and continuously treated with zoledronic acid (ZA) at 0.05, 0.50 or 5.00 μM concentrations. Drug effects on osteoblast proliferation, differentiation and mineralization were assessed. Additionally, mineralized 3D osteoblastic tissue was grown in a specialized bioreactor based on the principle of simultaneous-growth-and-dialysis. This 3D bone model provides a unique test system in which cancer cell interactions with osteoblastic tissue at controlled phenotypic maturities can be monitored in real time. Using this system, human metastatic breast cancer cells (MDA-MB-231) were co-cultured for 6 days with osteoblastic tissue in the actively-mineralizing phase (120 days of continuous culture). Without added ZA, cancer cells were observed to attach, penetrate, and colonize osteoblastic-tissue in a continuous process that ultimately marshaled osteoblasts into linear files similar to that observed in authentic pathological tissue. A single dose of ZA (at 0.50 μM and 0.05 μM administered 3 days after co-culture was initiated) delayed cancer-cell penetration and colony formation, with osteoblasts retaining the characteristic cuboidal shape observed in controls for the first 2 days of co-culture. Thereafter, cancer-cell colonization progressed to the filing stage.**

## INTRODUCTION

*Breast Cancer in Bone*

Breast cancer is the second most commonly diagnosed cancer in women in the United States, with an estimated 192,370 new cases of invasive breast cancer in 2009 [1]. Breast cancer also ranks second as the cause of cancer deaths, with an expected 40,610 breast cancer deaths this year [1].

Breast cancer may progress to become invasive, i.e. cancer cells spread throughout the breast tissue, or metastatic, i.e. cancer cells spread to other organs in the body [2]. Breast cancer frequently metastasizes to bone [3], where it disrupts the normal balance between the function of osteoblasts (bone-forming cells) and osteoclasts (bone-resorbing cells), favoring osteolysis [4]. Tumor cell production of parathyroid hormone-related protein (PTHrP) signals osteoblasts to increase expression of receptor activator of nuclear factor κB ligand (RANKL), which activates osteoclasts to begin bone resorption [5]. Transforming growth factor-β (TGF-β) is released from the bone matrix as it is degraded, which further stimulates cancer cell production of PTHrP [6], generating a "vicious cycle" between breast cancer and the bone environment.

Osteoblasts also contribute to bone loss during metastasis. Breast-cancer cells disrupt normal osteoblast function [7, 8] and suppress the production of matrix proteins. In addition they elicit an osteoblast stress response in which osteoblasts release inflammatory cytokines known to activate osteoclasts [9].

*Bisphosphonate Therapy*

A family of drugs called bisphosphonates has been widely used clinically for the management and prevention of skeletal complications from bone metastases [10]. Bisphosphonates are chemically stable synthetic analogues of inorganic pyrophosphate (P-O-P), a molecule that inhibits calcification [11], in which the oxygen atom has been replaced by a carbon atom (P-C-P). The third-generation, nitrogen-containing bisphosphonates, such as zoledronic acid, target the "vicious cycle" of breast cancer metastasis to bone in two ways – by reducing osteoclast activity and exhibiting direct antitumor effects on cancer cells. Bisphosphonates bind avidly to bone mineral, where they are internalized by osteoclasts during dissolution [12]. Once internalized, nitrogen-containing bisphosphonates inhibit the enzyme farnesyl diphosphate (FPP) synthase in the mevalonate pathway and interfere with functions essential for osteoclast survival [12, 13]. Bisphosphonates also directly affect tumor cells by inhibiting proliferation, inducing apoptosis, and interfering with adhesion, invasion, and angiogenesis [14].

The effects of bisphosphonates on tumor cells and osteoclasts have been well documented, but reported effects on osteoblasts vary among studies. Proliferation and differentiation of human fetal osteoblasts (hFOB 1.19) was reportedly enhanced by pamidronate coated cellulose scaffolds [15], while direct treatment of hFOB cells with pamidronate and zoledronate was found to decrease cell proliferation but enhance differentiation [16]. Treatment of human osteoblast-like cells derived from trabecular bone explants with zoledronic acid (ZA) promoted differentiation and mineralization but induced apoptosis at concentrations of 0.5 μM or greater [17]. The proliferation of primary human osteoblasts cultured on ZA-coated implants was not affected by concentrations up to 100 μM, while cells directly treated with 50 μM ZA were significantly reduced in number [18]. The proliferation and osteogenic differentiation of human bone marrow

stromal cells (BMSC) were enhanced by $10^{-8}$ M concentrations of alendronate, risedronate and zoledronic acid [19]. Zoledronic acid (1 μM – 1 nM) treatment of human mesenchymal stem cell (hMSC)-derived osteoblasts reportedly has little effect on differentiation but inhibits mineralization in a dose-dependent manner [20]. Studies using MG63 human osteoblast-like cells indicate that aledronate and pamidronate promote both proliferation and differentiation [21, 22], but zoledronic acid decreases proliferation in a dose-dependent manner [23].

*In vitro* studies using murine cell lines also produce various results. Treatment of MC3T3-E1 osteoblasts in tissue culture plates with 0.1-50 μM concentrations of zoledronic acid decreased cell proliferation [23], while the viability and mineralization of MC3T3-E1 cells cultured on calcium phosphate discs were unaffected by the same concentrations [24]. Researchers using aminobisphosphonates on primary rat osteoblasts and primary mouse osteoblasts found that nanomolar concentrations of each inhibited osteoblast mineralization while micromolar concentrations were toxic to the cells [25, 26]. Cells cultured on dentine substrates responded similarly to bisphosphonate treatment but at higher concentrations [25].

The results of these studies suggest that the effects of nitrogen-containing bisphosphonates on osteoblasts vary according to tissue complexity. To study the effects of these drugs on osteoblasts *in vitro* in a manner relevant to clinical applications, a sophisticated model of bone tissue is required.

*Compartmentalized bioreactor*

Modeling the bone environment to gain an understanding of the mechanisms underlying breast cancer colonization of bone is difficult. Cell systems must create an environment that provides biological relevance as well as experimental control [27]. The previous lack of a sophisticated bone model has not only hindered breast cancer metastasis research, but also has hindered the development and understanding of therapeutic treatments for bone metastases.

This research utilizes a compartmentalized cell culture device [28] based on the concept of simultaneous growth and dialysis pioneered by G.G. Rose [29] to grow and develop three-dimensional osteoblastic tissue for extended culture [30]. This compartmentalized cell culture device, hereafter referred to as the "bioreactor", consists of a cell growth chamber separated from a larger medium reservoir by a dialysis membrane. Waste from the growth compartment and nutrients from the medium reservoir are capable of dialyzing, while macromolecules synthesized by the cells as they develop are maintained in the cell growth space. Media is exchanged in the medium reservoir, thereby reducing drastic environmental changes cells experience in conventional tissue culture. The bioreactor creates an extraordinarily stable cellular environment that allows for the growth of multiple-cell layer osteoblastic tissue. Three-dimensional osteoblastic tissue has been maintained for over 10 months of continuous culture using this device [30].

The 3D osteoblastic tissue grown in the bioreactor can be challenged with metastatic breast cancer cells to model the initial stages of breast cancer colonization of bone. Human metastatic breast cancer cells (MDA-MB-231) introduced into existing cultures of murine osteoblasts (MC3T3-E1) were observed to adhere to and penetrate osteoblastic tissue and form colonies

within the cultures [31]. Furthermore, breast cancer cells were observed to align into "Indian files", chains of single cancer cells, characteristic of cancer invasion [31, 32]. This system allows for the real time monitoring of breast cancer colonization of osteoblastic tissue.

The purpose of this study was to characterize the effect of a nitrogen-containing bisphosphonate, zoledronic acid, on osteoblasts in conventional tissue culture and osteoblasts challenged with metastatic breast cancer cells in the compartmentalized bioreactor.

## MATERIALS AND METHODS

### *Cells and tissue culture conditions*

Murine calvaria pre-osteoblast (MC3T3-E1) cells were a gift from Dr. Norman Karin at the Pacific Northwest National Laboratories (ATCC CRL-2593). MC3T3-E1 were cultured in an incubator at 37$^{o}$C with 5% $CO_2$ and maintained in alpha minimum-essential medium ($\alpha$–MEM) (Mediatech, Herdon, VA) supplemented with 10% heat-inactivated neonatal fetal bovine serum (FBS) (Cansera, Roxdale, Ontario) and 1% 100 U/ml penicillin and 100 $\mu$g/ml streptomycin (Sigma, St. Louis, MO), hereafter referred to as growth medium. MC3T3-E1 were passaged every 3-4 days using 0.002% pronase in phosphate buffered saline (PBS). Cells were not used above passage 20. Growth medium further supplemented with 50 $\mu$g/ml ascorbic acid and 10mM $\beta$-glycerophosphate (Sigma, St. Louis, MO), hereafter referred to as differentiation medium, was used to develop mineralized, differentiated osteoblasts.

Human metastatic breast cancer (MDA-MB-231) cells genetically engineered to produce green fluorescent protein (GFP) were a gift from Dr. Danny Welch at the University of Alabama at Birmingham (ATCC-HTB 26). MDA-MB-231$^{GFP}$ cells are capable of forming bone metastases [33]. MDA-MB-231$^{GFP}$ were cultured at 37$^{o}$C with 5% $CO_2$ and maintained in Dulbecco's Modified Eagle's medium (DMEM) (Mediatech, Herdon, VA) supplemented with 5% heat-inactivated neonatal FBS and 1X non-essential amino acids.

### *Zoledronic acid*

Zoledronic acid (2-(imidazol-1-yl)-hydroxyehtylidene-1,1-bisphosphonic acid, disodium salt) was purchased from Toronto Research Chemicals, North York, Ontario and dissolved in 0.1 N NaOH to make a 5 mM stock solution.

### *Tissue culture*

MC3T3-E1 were plated at a sub-confluent density ($10^4$ cells/cm$^2$) onto 24-well plates (Corning, Corning, NY). Differentiating cells were maintained with periodic media changes every 3-4 days.

*Bioreactor design and implementation*

Compartmentalized bioreactors based on the principal of simultaneous growth and dialysis were constructed as described previously [30]. Briefly, 316L stainless steel stock rings were tightly secured together by stainless steel screws to create the body of the device. Two compartments – a cell growth chamber (5 ml volume) and a larger (30 ml volume) medium reservoir – were formed with two outer gas-permeable and liquid-impermeable films and an inner dialysis membrane. The films forming the outer barriers were approximately 3 mm thick and made by hot pressing Surlyn 1702 resin (DuPont, Wilmington, DE) using simultaneous application of heat (220$^{o}$C) and pressure (245 Pa) in a laboratory hot press. The inner film was cellulosic-dialysis membrane (Spectrapor-13266; Spectrum Medical Industries, Rancho Dominguez, CA) and was hydrated in de-ionized water for 2 hours prior to assembly of the device. Assembled bioreactors had a cell-growth area of 25 cm$^2$. Once assembled, bioreactor chambers were filled with 0.1% sodium azide in PBS, packaged in plastic bags, and sterilized using 10 Mrad γ-ray irradiation at the Breazeale Nuclear Reactor Facility at the Pennsylvania State University. Sterile bioreactors were rinsed 3 times with PBS and incubated overnight with basal medium (aMEM, 1% penicillin-streptomycin) prior to cell inoculation.

*MTT assay for cell proliferation*

MC3T3-E1 were plated at $10^4$ cells/cm$^2$ in growth medium. Following overnight incubation, zoledronic acid was added at 0.05, 0.50 and 5.00 μM concentrations for 24, 48, and 72 hours, upon which cell viability was assessed with an MTT assay. MTT (3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) (Sigma, St. Louis, MO) at 5 mg/ml in PBS was added to the cultures equivalent to 1/10$^{th}$ of the culture volume (50 μl/500 μl per well). Cells were incubated at 37$^{o}$C in 5% $CO_2$ for 2 hours. Cells were then rinsed once with PBS and 1 ml solubilization solution (0.1 N HCl, 1% Triton X-100 in isopropanol) was added to dissolve the formazan crystals. Samples were read at 570 nm on a spectrophotometer with 650 nm background subtraction. Viable cell numbers were used to determine proliferation over time.

*Alkaline phosphatase activity*

MC3T3-E1 were plated at $10^4$ cells/cm$^2$ in differentiation medium and maintained with periodic media changes for 17 days. After 17 days, differentiation medium was exchanged with zoledronic acid in concentrations of 0.05, 0.50 and 5.00 μM diluted from a 5 mM stock concentration with differentiation medium. Cells were cultured an additional week in the presence of zoledronic acid with two medium changes containing the drug. Following exposure to zoledronic acid for 7 days, MC3T3-E1 were stained for alkaline phosphatase activity. Culture medium was removed and the cells were rinsed twice with PBS. The cells were fixed for 10 minutes with 10% formaldehyde in PBS and then rinsed three times with PBS. Cells were

stained for alkaline phosphatase with a solution consisting of napthol, pre-warmed $dH_2O$, 0.2 M Tris (Sigma, St. Louis, MO) and Fast Blue RR Salt (Sigma, St. Louis, MO) and then incubated at $37^oC$ (no $CO_2$) for 30 minutes.

*Von Kossa stain for mineralization*

MC3T3-E1 were plated at $10^4$ cells/$cm^2$ in differentiation medium and maintained with periodic media changes exactly as described for the alkaline phosphatase assay except the cells were grown for 28 days. After 28 days, differentiation medium was exchanged with zoledronic acid in concentrations of 0.05, 0.50 and 5.00 μM. Following exposure to zoledronic acid for 7 days, MC3T3-E1 were stained for calcium phosphate and calcium carbonate salts. Culture medium was removed and the cells were rinsed twice with PBS. The cells were fixed for 10 minutes with 10% formaldehyde in PBS and then rinsed three times for five minutes each with $dH_2O$. A 5% silver nitrate solution (diluted in $dH_2O$) was added to the cells, and they were incubated in the dark for 30 minutes at room temperature. The cells were rinsed three times with dH2O, a final volume of 0.5 mL dH2O was added to the cells, and they were incubated for 2 hours under a fluorescent lamp.

*Bioreactor co-cultures*

MC3T3-E1 were inoculated into bioreactor cell growth chambers at $10^4$ cells/$cm^2$ and were cultured for 120 days with medium changes to the medium reservoir every 30 days. After 120 days, osteoblast tissue was stained with Cell Tracker Orange™ (Invitrogen, Carlsbad, CA) for live confocal imaging to monitor osteoblast morphology throughout the experiment. MDA-MB-$231^{GFP}$ cancer cells were inoculated into the cell growth chambers containing osteoblast tissue at a 1:10 ratio of breast cancer cells to osteoblasts ($10^5$ cancer cells/bioreactor). Cancer cells were observed using confocal microscopy. Zoledronic acid was added to bioreactor cell growth chambers in concentrations of 0.05 and 0.5 μM after 48 hours, a time when the cancer cells and the osteoblasts were re-organizing into files. Cultures were monitored for an additional 72 hours using confocal microscopy. On day 5, bioreactors were disassembled and the film containing adherent osteoblast tissue was carefully cut into pieces for various assays. Medium from the cell growth space and medium reservoir was also collected for analysis.

*Confocal microscopy*

Cultures maintained in bioreactors were observed daily using an Olympus FV-300 laser-scanning microscope (Olympus America Inc., Center Valley, PA) at 20x and 40x magnifications. Cell Tracker OrangeTM was excited using a 543 nm helium-neon laser and collected through a 565 nm long-pass filter. GFP was excited using a 488 nm argon laser and collected through 510 nm long-pass and 530 nm short-pass filters. The emission was split through a 570 nm dichroic

long-pass filter. Adherent osteoblast tissue from disassembled bioreactors was fixed in 2.5% glutaraldehyde in PBS and stained for actin filaments with Alexa Fluor 568 phalloidin stain (Invitrogen, Carlsbad, CA) for further image analysis.

## RESULTS

*Zoledronic acid effects on osteoblast proliferation.*

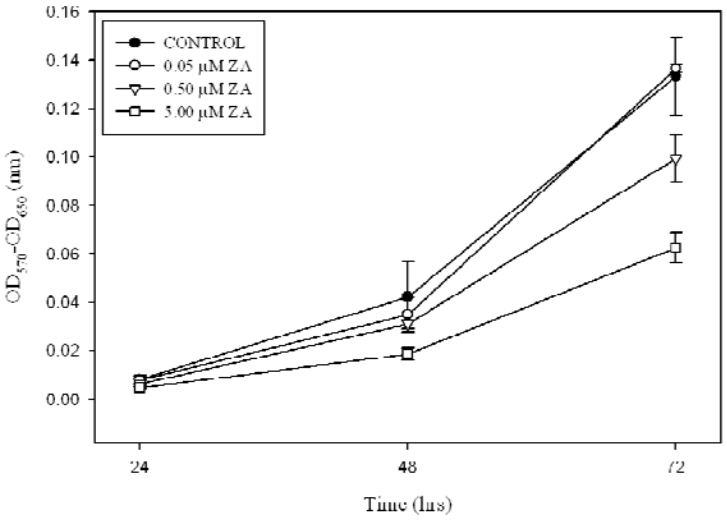



**FIGURE 1. Effect of zoledronic acid (ZA) on osteoblast proliferation.** MC3T3-E1 were plated at $10^4$ cells/cm$^2$, incubated overnight, and treated with ZA at 0.05, 0.50 and 5.00 μM concentrations for 24, 48, and 72 hours (control cells were untreated). Cell proliferation was assessed with an MTT assay.

Osteoblast proliferation was measured by quantifying mitochondrial activity using an MTT assay. MC3T3-E1 were continuously treated with zoledronic acid in 0.05, 0.50 or 5.00 μM concentrations for 24, 48 or 72 hours. Results are reported as average optical density at 570 nm with a background subtraction of 650 nm, plus or minus standard deviation between triplicate samples (Figure 1). Continous exposure to zoledronic acid at 0.50 and 5.00 μM concentrations for 48 and 72 hours inhibited osteoblast proliferation. Treatment with low concentration (0.05 μM) zoledronic acid, however, did not result in the same inhibition; the optical densities at all times were similar to the untreated controls.

*Zoledronic acid effects on osteoblast differentiation and mineralization.*

Effects of zoledronic acid on osteoblast differentiation were measured by staining for alkaline phosphatase production. Alkaline phosphatase is an enzyme linked to osteoblast differentiation. Cells were cultured in differentiation medium for 17 days and then continously treated with zoledronic acid in 0.05, 0.50 or 5.00 μM concentrations for an additional 7 days. The culture dish was scanned to generate images of the tissue (Figure 2, A-D). Zoledronic acid at 5.00 μM (D) exhibited relatively strong inhibitory effects on alkaline phosphatase production.

Drug effects on mineralization were assessed by a Von Kossa stain for calcium phosphate and calcium carbonate salt deposits. Von Kossa's stain indirectly measures calcium in mineralized tissue. MC3T3-E1 were cultured in differentiation medium for 28 days and continuously treated for 8 days with zoledronic acid in 0.05, 0.50 or 5.00 μM concentrations. Images of the stained tissue were taken with a digital camera (Figure 2, E-H). All concentrations of zoledronic acid disrupted osteoblast mineralization (F-H) when compared to controls (E).

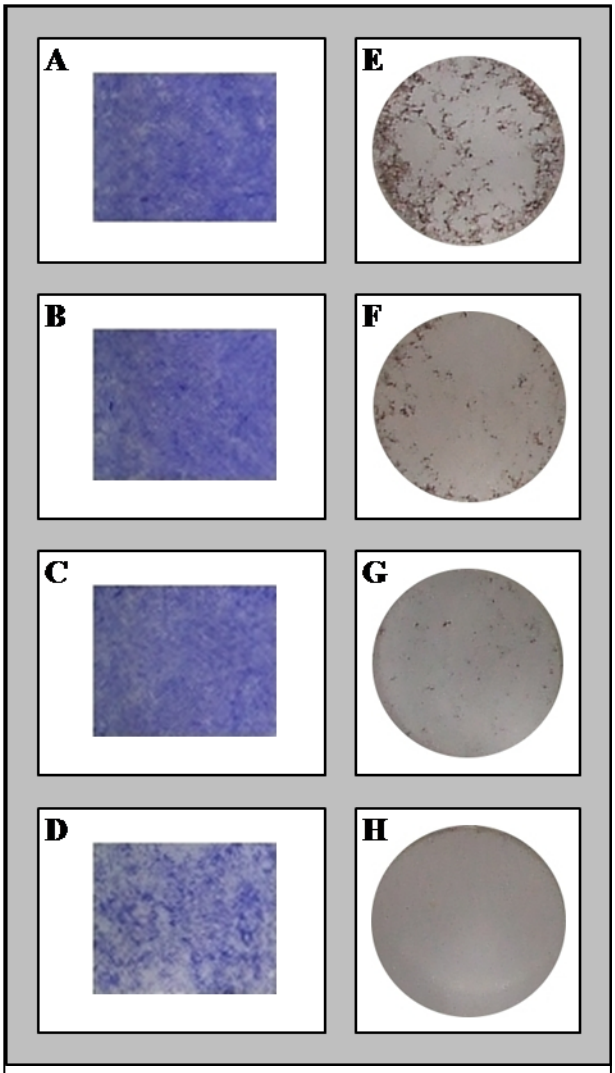
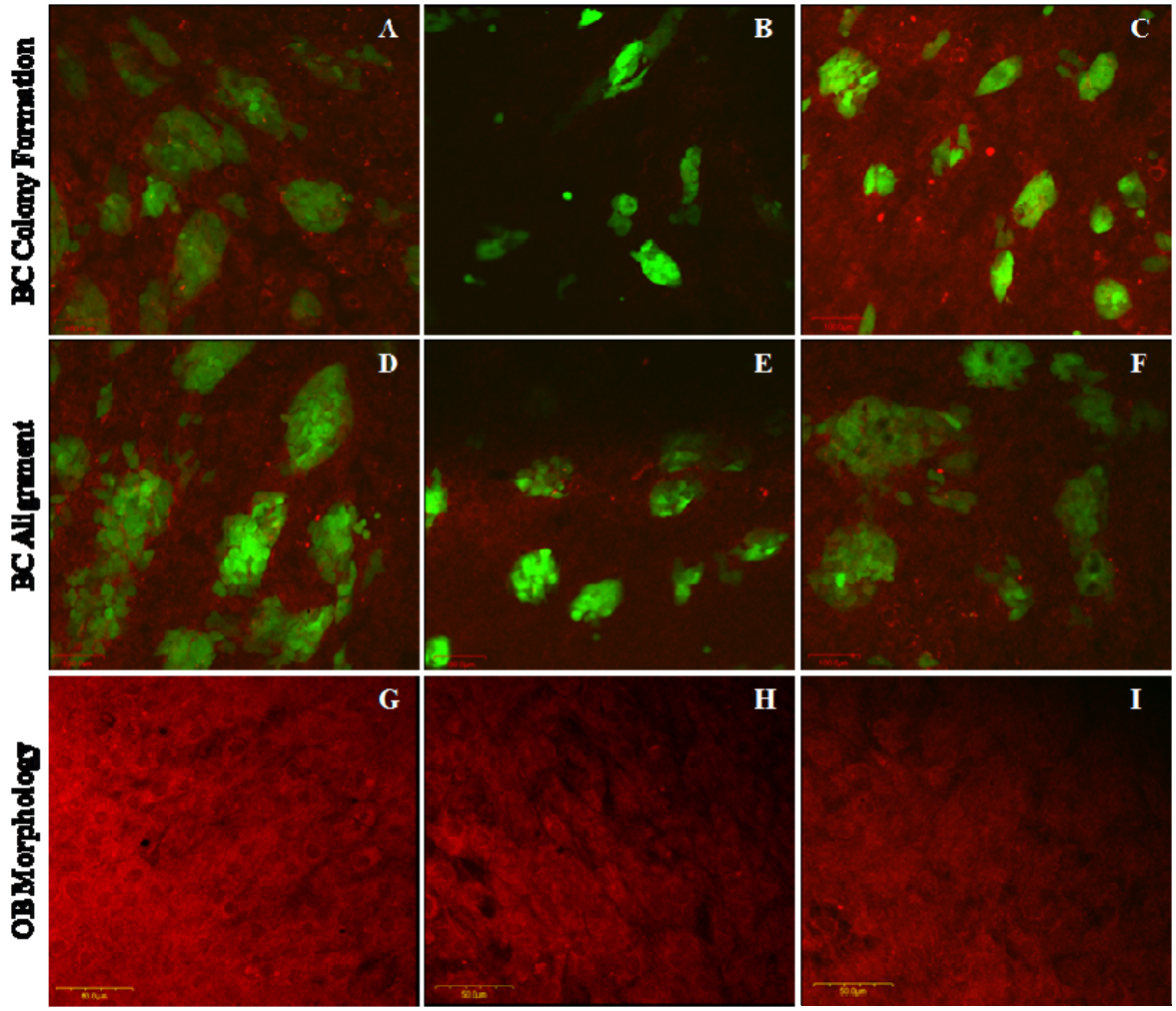



**FIGURE 2. Effect of zoledronic acid (ZA) on osteoblast mineralization and differentiation.** MC3T3-E1 were plated at $10^4$ cells/cm$^2$ in differentiation medium and allowed to grow for 14 days (A-D) or 28 days (E-H) with periodic medium changes. Cells were then continuously treated with ZA at 0.05 (B,F), 0.50 (C,G) and 5.00 (D,H) μM concentrations for 8 days. Control cells (A,E) were untreated. Cell differentiation was assessed by alkaline phosphatase activity (A-D). Mineralization was determined with a Von Kossa stain (E-H).

*Effects of zoledronic acid on breast cancer colonization of osteoblast tissue.*

MC3T3-E1 were cultured in the bioreactor for 120 days with medium changes to the medium reservoir every 30 days. The osteoblast tissue was then challenged with metastatic breast cancer cells. Cancer cells were observed to colonize the tissue and organize into linear files after 48 hours, at which time zoledronic acid was added to the cultures in 0.05 and 0.5 μM concentrations. Cultures were maintained and monitored using confocal microscopy for an additional 72 hours.

Confocal images show breast cancer cells expressing green fluorescent protein (green) and osteoblasts stained with Cell Tracker Orange or Alexa Fluor 568 phalloiding (red) (Figure 3). Treatment with zoledronic acid reduced the formation of breast cancer cell colonies (Figure 3, compare A with B,C) and disrupted the alignment of breast cancer cells within the osteoblast tissue (Figure 3, compare D with E,F). Zoledronic acid also inhibited the penetration of breast cancer cells through the multiple-layer osteoblast tissue (Figure 3, table). Osteoblasts in cultures treated with zoledronic acid retained the characteristic cuboidal shape observed in the control (untreated) culture.




| Experimental Parameter | Culture Conditions | | |
|---|---|---|---|
| | OB + BC | OB + BC + 0.05 μM ZA | OB + BC + 0.50 μM ZA |
| BC Colony Formation | +++ | + | ++ |
| BC Alignment | +++ | + | ++ |
| Spindle-shaped OB Morphology | +++ | + | ++ |
| Tissue Penetration | +++ | + | ++ |

**FIGURE 3. Qualitative analysis of the effects of zoledronic acid (ZA) on MDA-MB-231 metastatic breast cancer cell (BC) colonization of osteoblast (OB) tissue.** Cancer cells (green) were observed to penetrate and colonize osteoblast tissue (red) in the bioreactor (A,D,H). Addition of ZA to co-cultures in the bioreactor resulted in reduced breast cancer colony formation (B – 0.05 μM ZA, C – 0.50 μM ZA, 24 hr exposure) and disruption of cancer cell alignment with osteoblast tissue (E – 0.05 μM ZA, F – 0.50 μM ZA, 48 hr exposure). ZA delayed breast cancer cell penetration of osteoblast tissue (table) and osteoblasts retained characteristic cuboidal shape (I – 0.05 μM ZA, 72 hr exposure) consistent with controls (G). Scale bar = A-F: 100μM, G-I: 50 μM.

## DISCUSSION AND FUTURE WORK

In this study, zoledronic acid was observed to have a notable effect on osteoblast proliferation, differentiation and mineralization. Treatment of sub-confluent MC3T3-E1 osteoblasts with zoledronic acid yielded a dose-dependent effect on proliferation (Figure 1), with higher concentrations of zoledronic acid inhibiting cell proliferation. Treatment with 0.50 μM zoledronic acid for 72 hours resulted in an approximate 25 percent reduction in osteoblast number, while treatment with 5.00 μM zoledronic acid for the same time inhibited proliferation by approximately 50 percent of the control. Exposure to a lower dosage (0.05 μM) of zoledronic acid had no statistically significant effect on osteoblast proliferation. However, these studies were carried out with cells grown in conventional tissue culture conditions.

Continuous treatment of 17- and 28-day old differentiated osteoblasts with zoledronic acid for one week resulted in decreased alkaline phosphatase production and calcium deposition, respectively (Figure 2). A continuous dose of zoledronic acid at 5.00 μM led to a reduction in alkaline phosphatase (Figure 2, D), while lower concentrations had little effect (Figure 2, B-C). All tested concentrations of zoledronic acid inhibited mineralization (Figure 2, F-H). Again, these tests were carried out with cells grown in tissue culture.

Exposure of three-month old osteoblasts grown in the bioreactor and challenged with metastatic breast cancer cells delayed the progression of cancer cells within the osteoblast tissue and temporarily maintained osteoblast tissue integrity (Figure 3). ZA treatment reduced the formation of breast cancer colonies (Figure 3, A-C) and inhibited breast cancer cell penetration of osteoblast tissue (Figure 3, table). Exposure of cancer cells to zoledronic acid also disrupted cancer cell alignment within the osteoblast tissue (Figure 3, D-F).

These results indicated that concentrations of zoledronic acid that minimally affect osteoblast function are capable of delaying breast cancer progression to bone. These data should be interpreted with caution, however. Other studies indicate that low concentrations (10 nM) of ZA do not significantly inhibit osteoblast proliferation until after 7 days of continuous culture [25]. Additionally, little is known about the adsorption kinetics of bisphosphonates. It is unclear whether ZA treatment of osteoblasts challenged with cancer cells in the bioreactor resulted in a true delay of breast cancer progression or occurred due to diffusion of ZA from the growth chamber to the medium reservoir. To address these concerns, future work will ensure that osteoblast proliferation is measured over an extended growth period and zoledronic acid is added to both bioreactor chambers.

Further analysis of the effects of zoledronic acid on breast cancer colonization of osteoblast tissue in the bioreactor is also required. RNA isolated from the bioreactor cultures will be analyzed for expression of osteocalcin, Type I collagen, and other bone proteins. In addition,

increases or decreases in cytokine production will be measured using medium collected from the bioreactor compartments.

Further studies will introduce the chemotherapeutic drug docetaxel into the bioreactor system, as literature suggests that zoledronic acid enhances the effects of docetaxel [34-39]. This study has shown that the bioreactor is a useful device for the study of drug effects on the early stages of breast cancer cell interactions with bone tissue.

## ACKNOWLEDGEMENTS

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# Full Service Schools: The Children's Aid Society Model and How it Changes Students' Lives

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***Abstract***

*Full service schools offer a wide array of services and programs that aim to address the various needs of students and foster healthy development and academic achievement in students and their communities. An increase in the number of full service schools in the United States has compelled those involved in the planning processes to ask questions pertaining to how communities benefit from the goals of the schools and from the actors involved in the schools. This review explores how full service school planners examine these questions and how they apply their gained knowledge to their school policies.*

## Introduction

Full service schools or "community schools" aim to think outside of the box and transcend traditional schools which usually only take into account the academic needs of a student for the eight hours that he is in the school building (Blank, 2008; Mitra, 1994). In "traditional" schools, it difficult to address all of the issues that children deal with that affect their development, quality of life, and preparation for success in the classroom.

Full service schools attempt to focus on a more holistic view of the student and consider the multitude of needs that the student has. These needs can range from assistance with mathematics homework, to transportation to school, to a visit to the doctor's office for an annual checkup (Dryfoos, Quinn & Barkin, 2005 p.21; Tough, 2004). Ultimately, the goal of community schools is to help the student prepare to arrive to the classroom ready to learn. The teacher will then be able to transmit the information to the student and expect that he will readily accept it (Dryfoos, Quinn & Barkin, 2005, p.19).

In order for the teacher to step in and do his job, a number of other actors must become involved in the process to move the student toward academic success. The full service school invites numerous people to prepare the child to learn. These people include doctors, community volunteers, social workers, funders, lead agency directors, and a host of others. The focus of the community school is to include everyone in the community who affects the child's life—not just those who are typically involved in the schooling process (Harris & Hoover, 2003; Terreon,

2006). In addition, the community school aims to include others who may benefit from the services provided in the school. It's called a "community school" because it is meant to tend to the needs of the residents of the community (Curtis & Simons, 2007). The services that are provided at the school, or the programs that are run there, are dependent on the needs of the particular community. This is one of the reasons why the idea of community schools is so appealing—it is not a one-size-fits-all approach (Dryfoos, Quinn & Barkin, 2005, p.152). Each community has unique needs and depending on the resources available, a plan can be designed which caters to a given community (Albert 2005; Blank, 2008; Dryfoos, Quinn & Barkin, 2005, p. 190).

This fact also relates to the different terminology that is often used in describing community schools and the services that are available in them. The term "community school" is often interchangeable with the term "full service school." While some scholars explain differences such as the array of services available and the number of actors involved in the school as real differences between full service and community schools, the terms typically describe the same type of school—one that is open to a large number of consumers, not just school-aged students and offers services that aid in fostering healthy development in students and in developing the community surrounding the school so that people can lead fulfilling lives with the opportunity to reach their personal goals. The services that are available are called *school-linked services* because they are provided within the school or at a nearby location through a partnership between the school and some outside social service agency or organization. In some communities, while there is no full service or community school, there are *integrated social services*. Integrated social services are a series of services—health, educational enrichment, immigration, and a host of others, that may be available to a community. The services are provided in conjunction with each other in order to approach all of the issues that community members may have that have a negative effect on their health and quality of life. At full service and community schools, the integrated services are school-linked (Dryfoos, Quinn, & Barkin, 2005; Sullivan & Sugarman, 1996)

A survey of the literature on community and full service schools suggests that many efforts have been successful; however, to be successful, a school does not simply need to designate itself as a community school and offer a host of services to the community (Crowson & Boyd, 1996). There are specific components that are helpful in building a community school and working to make it successful (Dryfoos, Quinn & Barkin, 2005, p.193). In order to incorporate these components as they relate to a given school, school administrators, lead agency staff, and community members must ask a number of questions to identify the ways that these elements will be most beneficial for the community in which the school is located (p.197).

*The Children's Aid Society* The Children's Aid Society (CAS) schools were chosen for deeper focus because of the wide range of schools that the society has planned and operated and for the variety of services that are offered. Also, many look to these schools as models for full service schools as they have been in operation for over a decade and have had considerable success in reaching the goals of full service schools by looking at student's needs holistically and facilitating collaboration between various agencies, by increasing academic achievement, and by helping communities to develop towards being places where neighbors work together to create healthy environments for their children and fellow residents.

In 1990, the Children's Aid Society (CAS) entered a legally-binding partnership to have planning power in thirteen schools in low-income neighborhoods in the Washington Heights area

of New York City. Washington Heights was chosen because of its population of recent immigrants and residents dealing with poverty, unemployment, and a host of other problems, but with little resources to deal with the problems. Traditionally, CAS had provided remedies to such problems, but in order to address them on such a large scale, the partnership realized that the children and families of these communities needed more resources and influence than just any single group could provide. The residents needed the help of CAS, the school district, government social service agencies, and private organizations. The coalition involved elementary, middle, and high schools, and aimed to provide a range of services, depending on the needs of individual communities (Dryfoos, 2002; Dryfoos, Quinn & Barkin, 2005).

For this review, I focus on two schools in particular when discussing community schools. They are the first schools that were operated through the partnership between the Children's Aid Society and the New York City Board of Education—Intermediate School (IS) 218 and Primary School (PS) 5. IS 218 is a middle school, located in the Washington Heights area of New York City. Residents of the community surrounding the school are described as "low income." The area is marked by violence, drugs, and high rates of teen pregnancy. In addition, the community has a large immigrant population, and much of the residents are English Language Learners (ELL) (Dryfoos, Quinn & Barkin, 2005, p. 14; The Children's Aid Society 2006). Families are typically large and the services available to deal with their problems are few. PS 5 is an elementary school in a neighborhood that is demographically similar to the neighborhood where IS 218 is located. There is a large immigrant population, services are few, and families are in need of help (Dryfoos, Quinn & Barkin, 2005).

The interest in these schools arose after reading *Community Schools in Action: Lessons from a Decade of Practice*. These schools were highlighted as they could provide a great amount information regarding the starting process of full service schools. The schools had also been evaluated and thus could provide some information regarding student outcomes as a result of turning the schools into community schools. After reading this book and other literature regarding full service schools and studies conducted in them, specific aspects of the schools stand out as being very important. This review examines those aspects and how they differ from what is commonly found in traditional schools. The aspects that are examined here are:

- The goals of the schools and the communities in which they are located and how these differ from the goals of traditional schools.
- The actors who are involved in the schools and how these differ from the actors in traditional schools.
- The issues that arise in full service schools and how those involved in the schools can deal with them

With regard to the first two items, this review explains how the students of full service schools benefit as opposed to if they had attended traditional schools. By explaining this fact, one can consider the idea that converting traditional schools to full service schools may be a worthwhile endeavor and can benefit those involved, including students, parents, school staff, and other community members.

## Methods

In order to gain a basic understanding of the structures and functions of full service schools, I conducted a search of available resources using the catalogue for the social science library at The Pennsylvania State University. Using keywords such as: *full service schools, community schools, and integrated services,* I was able to obtain a list of books, dissertations, and articles that related to the topic at hand. I collected these resources from the library and read relevant chapters, sections, and paragraphs for a better understanding of full service schools.

After formulating a fairly general understanding of full service schools, I then used databases including the Education Resources Information Center (ERIC), Sage Publications Online, and a multiple database search on the Penn State University Library website for the area of Educational Policy. I searched for the keywords: *full service schools, integrated services, community schools,* and *Children's Aid Society* to identify articles that related to the topic of full service schools. While reviewing the search results, I looked especially closely for articles that focused on specific studies of various full service schools and programs and which could offer numerous details and learning experiences from the programs and their successes and failures. Once I identified relevant articles, I read each one to get a deeper understanding of the particular study, its results, and implications.

When the database searches did not provide any more relevant and up-to-date articles, I used the references from the articles that I had already read to learn more about the topic. In most cases, I used an online service called "citation linker" on the Penn State University Libraries website which allows students to enter information about an article; the system then locates the article and makes it available to the student for use. I also found that a few relevant articles had come from the *School Community Journal*, so I went directly to the online site for this journal and was able to search past issues using the keywords that I used in other databases and found more articles.

I decided which sources to keep and use for my study based on a number of factors. The first important factor was the relevance to the main topic at hand—full service schools, the services provided within them, and the people who work together to deliver the services. I also considered the number of studies or cases included in the article. If an article was a review of various studies, I used it as a source for general information, but if the article focused on one study, or compared a few, I used it for its details and deeper understanding of the individual studies. Finally, I kept sources based on their ability to answer the questions that I am interested in answering in this paper: what are the goals of full service schools, who are the people involved in full service schools, and what are the issues that full service schools face and how can they be addressed?

I used articles to answer these questions by dividing the articles into categories based on the questions that they will answer best. This is dependent on the focus of the articles as well as the results of the studies. Some studies answer all three big questions while some only answer one or a part of one. It is important though that each study contributes something unique to the greater understanding of full service schools and their role in society.

For specific data regarding the CAS schools, PS 5 and IS 218, I used information from a number of evaluations done by scholars at Fordham University's Graduate School of Social Service. The studies were conducted from 1993-1999 and are summarized in *Community Schools in Action: Lessons from a Decade of Practice* and the American Youth Policy Reform's *Summary of the Children's Aid Society Community Schools Results to Date.* The studies provide

data not only on PS 5 and IS 218, but on two other schools: Intermediate School 52 and Primary School 152. These schools were included because they were demographically similar to IS 218 and PS 5 and could serve for good comparison schools to examine the changes in IS 218 and PS 5 after they became CAS community schools.

## Ideal Goals of Full Service Schools

Full service schools ideally tend to the many needs of children. Unlike traditional schools, full service schools adopt a broad approach to addressing the myriad of problems that face today's children. They focus on more than just the educational needs of children and instead address their emotional, psychological, vocational, social, and physical needs (Blank, Ferrera, & Santiago, 2008; Curtis & Simons, 2007).

In addition to addressing the needs of the child, the full service school also considers what the community that surrounds the school needs. Full service schools are built on the idea that the condition of the community surrounding the school affects the progress of the school. The school—the administration, the teachers, the lessons taught in the classroom do not stand alone. Many factors contribute to the life of a student and many of those factors affect the student's educational success; thus, if the school is to be successful in developing students academically, it needs to consider how to first develop the community so that it can provide a healthy environment for the student (Canada, 2001).

Regardless of the location of the school and the condition of the neighborhood, the full service school should be adaptable. Whether parents in the community note that unemployment is a problem and that they need help acquiring some skills to be more marketable in the workforce, or whether the community has a large immigrant population and parents need English as a Second Language (ESL) classes to remove the language barriers that exist when they try to communicate with school staff, the full service school takes all of this into consideration, noting that all of these factors have an influence on the student's success in the school (Blank, et al., 2008). In deciding which services should be available and what the community needs to progress, collaboration and communication between parents, school administrators and teachers, and other community members is crucial (Abrams & Gibbs, 2000; Blank, et al., 2008; Harris & Hoover, 2003). Table 1 below shows just some of the services that are commonly provided at full service schools. The services have been divided into four broad categories that correspond to the areas of children's lives that full service schools aim to address.

Table 1.

*Services Provided by Community Schools*

| Student Academics | Family | Community | Health Services |
|---|---|---|---|
| • After-school tutoring<br>• Educational Academies based on student interests and future career prospects<br>• Saturday Enrichment Programs | • Adult Education Courses<br>• Childcare<br>• Parenting Classes<br>• Social Worker | • Adult Education Courses<br>• Clubs based on Hobbies/Interests<br>• Cultural Events<br>• Immigration Services | • Dentist<br>• Physician<br>• Psychologist |

Usually, various agencies, all tending to one particular dimension of the "big problem" compete with each other rather than work together to help children and families (Harris & Hoover, 2003). The "big problem" is one that results from some underlying matter. A child may have health issues, arrive to school hungry, and perform badly academically because his family has a low income. A state agency can provide the child with health insurance, but who will insure that the child is taken to the doctor? A parent can insure that this happens but maybe the parent's low-paying job does not allow any time off. The student does not get much to eat at home because there is no money to provide all meals, so another agency can provide free breakfast and lunch at the school. No one is at home to help the child with his homework, so he does not perform well in school. A student at a local community center may provide tutoring. All of these problems arise out of a root issue, but typically, if the agencies that can remedy the issues are contacted, they are contacted separately and thus, only treat a symptom of the larger problem, rather than looking at the problems as a system, a package that is affected by another force (Mitra, 1994). Another important element of full service schools is to increase communication between the various actors in children's lives to achieve better results. One step in this increased communication involves sharing power and trusting that the other people involved in the process have the ability to make decisions. Collaboration is crucial as far as it allows the various agents in the children's life to work together to achieve academic success and healthy development.

Various full service programs exist across the country as partnerships with universities, nonprofit organizations, neighborhood groups, and single-service agencies such as those that provide medical services, help with immigrations issues, and social services (Dryfoos, 2002; Kronick, 2002). Beacons schools and community centers are a well-known example of full service programs. These programs are based on the same premise as many full service schools—that various influences penetrate students' lives and that these influences all affect the students' wellbeing and educational success; thus, the Beacons aim to fill the students' lives with positive influences so that the students will have positive outcomes in different areas of their life. The

Beacons are commonly structured as after-hours programs—available when the school building would usually be closed, at night, on the weekends, and during the summer. The staff of the Beacons centers organizes programs and events that focus on educational enrichment, family involvement, community safety and partnerships, youth development, and various other programs that cater to the needs of the community. Various community organizations and agencies work with the schools to make the efforts possible (Canada, 2001; Constancia, Feist, & Nevarez, 2002).

The important link here and with all full service schools is that each of these programs, with its special purpose and population that it serves, should be identified by its theme or defined by its specific goal or set of goals. In reaching that point, all full service schools must consider this important step of exploring what full service schools are exactly: what are they supposed to do ideally and how they have been implemented across the country. By doing this, those involved in the planning process for new full service schools, or in the reforming process for existing programs can use a wealth of knowledge to make decisions and develop a map for their schools that are based on specified goals and purposes, and also on experience (Abrams & Gibbs, 2000; Crowson & Boyd, 1996; Dryfoos, Quinn & Barkin, 2005).

## CAS Community School Goals versus Comparison Schools

*School Focus* In their study, Fordham University Scholars found significant differences between the focus of the CAS community schools IS 218 and PS 5 and the focus of the comparison schools PS 152 and IS 52. As "traditional" public schools, PS 152 and IS 52 taught students the basics—English, mathematics, and reading to prepare them for exams, which people typically consider as goals of a school. In addition, these schools did not take a precautionary approach but rather reacted to the problems in children's lives on a case-by-case basis (Dryfoos, Quinn & Barkin, 2005).

In comparison, PS 5 and PS 218 consider the many elements that go into making a healthy life experience for students when creating the goals that should be met in the schools. The schools tend to the educational needs of students. In PS 5, students are enrolled at a very young age for preschool programs so that the community school director, teachers, and program coordinators get accustomed to working with children of different age groups, even those not typically served in public schools. Preschool classrooms are housed in the same buildings as the elementary school so younger students experience the academic experiences of older students and get to witness a model of academic life before they are fully immersed in it. Some children never step into a school or never get exposed to the idea of school until it is time for them to attend. Students at PS 5 are well-prepared to begin school on a proper level (Dryfoos, Quinn & Barkin, 2005, p. 22; American Youth Policy Reform, 2006).

In IS 218, students are enrolled in one of four educational academies based on their personal interests. Academies are centered on arts, business, science and technology, and community service. A number of after-school and Saturday enrichment programs are also available to supplement the regular school day instruction. The principal, teachers, and parents are all accountable for students' academic success and thus have an interest in working towards that success (Dryfoos, Quinn & Barkin, 2005).

PS 5 and IS 218 also tend to the medical need of children. Both schools offer dental, medical, and mental health services on site for students and their families. At PS 5, pregnant

women can enroll in prenatal programs to develop normally and prepare to care for healthy children and young children are brought to the center for regular check-ups and dentist visits. At IS 218, there is an adolescent health center and students can take advantage of services related to pregnancy prevention and drug treatment (Dryfoos, Quinn & Barkin, 2005; The Children's Aid Society, 2006).

The schools also consider children's social needs by providing English as a Second Language courses for students and their families. Immigration services are available to secure support or documentation and community school staff helps students and other community members to find employment. At IS 218 students organize cultural events and attend workshops on how to maintain healthy relationships in different social contexts (American Youth Policy Reform, 2006; Dryfoos, Quinn & Barkin, 2005). At PS 5 parents are welcomed into the school before students are old enough to attend. Students who are not yet school-aged are able to join together with their peers at school events and also witness older students in school interacting and working together.

As described above, CAS community schools have a wider focus than schools that are not classified as full service schools or community schools. The community schools focus on different aspects of a child's life and aim to target all of those aspects—academic, health, and social, among others. The schools offer various services to address those aspects and tend to students and other community members.

*Community Involvement* Community schools also differ in their encouragement of community involvement in the schools. Unlike the non-full service schools, IS 218 and PS 5 consider what the community surrounding the schools needs. The non-full service schools typically attempted to isolate the school from the community. Recognizing that many negative influences are present in the community such as violence, drugs, and lack of motivation or encouragement, non-full service schools try to bring students into the school and wash them free of those influences(Abrams & Gibbs, 2000; Kirkner, Meyer-Adams, & O'Donnell, 2008; The Children's Aid Society, 2006).

CAS community schools acknowledged the presence of these negative influences and realized that students needed positive influences in the community to counteract these negative influences. At IS 218, the school building is open fifteen hours each day so that parents and other community members can visit and take advantage of resources when they are available to do so. The comparison schools did not have long extended hours and typically, schools are open for eight or nine hours each day and working community members never have the opportunity to visit the school while it is open (Dryfoos, Quinn & Barkin, 2005, p. 20; The Children's Aid Society, 2006). At PS 5, parenting classes are available and town hall meetings are held frequently at both schools to bring in community members' input for school improvement. A host of other services are available to cater to the needs of the specific community and its members (Dryfoos, Quinn & Barkin, 2005).

*Collaboration* CAS community schools also differ from the comparison schools in the collaboration that the schools encouraged between different actors in students' lives. The comparison schools typically only considered the child's needs for the eight hours that he was in the school building. The schools did not attempt to address the outside influences and actors that entered the child's life outside of the school building and affected his healthy development.

At IS 218 and PS 5, the school principal actively sought out community organizations that could use the school building to promote their causes. These organizations ranged from those that focused on drug prevention to neighborhood catering businesses. The school principal also worked closely day-to-day with the community school director who was employed by CAS. Social workers took visits to the students' home and it was a common occurrence to see parents visiting the building to meet with teachers and other staff. By housing medical services in the building, the workers in this area were able to work with teachers and social workers to consider the causes of students' issues and attempt to solve their problems rather than treat different aspects separately (American Youth Policy Reform, 2006; Dryfoos, Quinn & Barkin, 2005).

## Actors in Full Service Schools

*Lead Agency* In full service schools, the lead agency serves as the facilitator for the goals of the program and the interactions that occur to reach the goals. If the goal of the full service school is to provide dental services to students at an elementary school so that the students receive regular check-ups and so that any of their existing dental problems are corrected, then the lead agency focuses on this goal. Whether the practice that provides the service is low-staffed, or whether the funding source is not providing enough funding, the lead agency makes the effort to remedy these issues. Its goal is to keep all plans on track to reach the schools' goals (Dryfoos, Quinn & Barkin, 2005).

With individual organizations, groups often make efforts to maintain the practices, or even the existence of their agencies. Even if it doesn't help the problem at hand, those in the organization will attempt to approach the problem with the restraints of their specific organization (Crowson & Boyd, 1996; Harris & Hoover, 2003; Mawhinney & Smrekar, 1996). At the same time, the issue at hand—the dental care of the students, is not the first priority, because those involved are focused on their agency. The role of the lead agency is to eliminate this factor, which is simply a hindrance to the task at hand (Canada, 2001; Dryfoos, Quinn & Barkin, 2005).

The reason why this overarching partner is necessary is because the full service school aims to look at the child holistically. No single issue is isolated and no single problem occurs without affecting other factors in the child's life. If a student needs dental care because he has not visited the dentist in five years, then there is a good chance that he also has not visited a physician in five years. If the student simply goes to the dentist, the dentist will not typically ask when the student last visited the physician or how he or she is doing in school. The dentist will perform the task that he, as a dentist, is supposed to perform, and be satisfied knowing that he has done his part. The lead agency focuses on all of the "parts" and attempts to make them one. Anyone can refer a student to an agency for one single issue that he is dealing with, but then that does not take into consideration the source of the problem. A hungry child does not only need food, but rather a parent who can obtain a paying job and provide food for the household. A student who can't read doesn't only need a reading tutor, but he needs a daycare center so that his mother can attend an academic enrichment program with him and learn how to help him with his homework while his younger siblings play nearby and learn their alphabet (Dryfoos, Quinn & Barkin, 2005; Harris & Hoover, 2003).

In reaching towards this goal of dealing with the issues of children holistically, through partnerships with various agencies, there is no single model that a lead agency follows to accomplish this task. The lead agency may operate in a top-down manner, whereby all other

partners—the school administration, the dentist, the physician, the nutritionist, and the immigration services representative—"report" to the agency. The lead agency may also work as a referee, controlling the interactions of the various partners and making sure that they keep on track and working on the task at hand—to provide a healthy, meaningful, educational school and community experience for the student. The most important factor is that the lead agency, in facilitating the collaborations, does not exclude any actors from the process, which is contrary to the purpose of having a lead agency (Mitra, 1994; Smrekar, 1998).

As discussed previously, the Children's Aid Society, in 1990, partnered with thirteen different schools in low-income areas in the Washington Heights area of New York. In this partnership, CAS worked with the existing school power structure as well as with the agencies that were providing services within the school in order to insure that the full service schools would meet their mission in looking at children holistically and considering their many needs. By engaging the outside agency, not just those that provided the services, this partnership included a "checking system"—CAS always kept the core goals of the partnership at heart, even if other actors only paid attention to the specific areas that they were supposed to address, not at the big picture (Dryfoos, Quinn & Barkin, 2005).

Along with CAS, a number of other agencies and organizations have taken on the role of lead agency in full service schools across the country. These lead agencies can be thought of as fitting into categories—general and specific. Some agencies, such as CAS, incorporate the missions of various other agencies for health, education, poverty relief, etc. into their approach, while other agencies, which specialize in one area, maybe health, may develop a program in that area. Either approach may work, depending on the needs of the community, provided that the lead agency considers how the various problems in the child's life are connected and how they can be remedied through the work of the agency. Lead agencies may have a health, cultural, or educational basis, among a host of other focuses.

*Funders* Funding for full service schools comes from a number of sources, based on the focus of the school and the community in which it is located. A number of foundations and charity-based organizations provide money to full service schools, such as the Anne E. Casey Foundation and the W.K. Kellogg Foundation. The Annie E. Casey Foundation, based in Baltimore, Maryland, and the W. K. Kellogg Foundation, based in Battle Creek, Michigan, both aim to improve the quality of life for children and families both in the United States and in other countries. Various community programs and full service schools have been granted money and support from these foundations (Annie E. Casey Foundation, 2009; Curtis & Simons, 2007; Smrekar, 1998; W. K. Kellogg Foundation, 2009).

Full service schools are also largely funded by government monies. These resources may have been allocated for the school and education, or they may have been given to social service agencies to provide services to the community. At times, money may be given to the school because it is a full service school—because it tends to numerous needs of children. Usually, because full service schools tend to operate in low-income areas, where students are likely underprivileged, the resources available for programs may not always be abundant; thus, the efficient usage of funds becomes an important task.

Funds may also be provided by various other private and public programs. There are countless organizations and institutions that are concerned with the wellbeing of children, their educational success, and the development of communities; thus, these organizations and

institutions invest money and effort in these programs. The exact source of resources depends largely on the location and focus of the program.

*School Administration/Staff* The first word that many people hear in the phrase "full service school" is "school." For this reason, the original school staff—administrators, teachers, nurses and others—plays a very important role in the full service school. This makes sense, considering that the purpose of incorporating various services into the school is to make it possible for the educational initiatives of the school to be met.

Traditionally, school staff serves a specific purpose—to concern itself with the educational achievement of students while they are in the school building. For some this extended beyond the regular school day because a student's achievement in school was affected by what happened at home, but largely, the tasks of a teacher, a school principal, a school nurse, a cafeteria server could be defined and were fairly rigid across the board. Principals are expected to oversee the work of other school staff, implement district policy, and maintain the stability of the school. Teachers are to relay the academic material to students, and other staff fit in to allow these things to happen. A school nurse takes care of students' minor health needs so that they can stay in class. Various other staff, such as non-teaching assistants, monitors halls or lunchrooms to insure that things are in order long enough for the students to get through the school day. In Many cases, no one steps outside of the actions that are absolutely necessary to accomplish the minimal goals of the school (Abrams & Gibbs, 2000).

In interactions with parents and community members, school staff has also traditionally had an interesting approach. Because administrators and teachers believe that they occupy a very different sphere from parents, they have often allowed interaction with "outsiders" to occur only on their terms. Thus, administrators and teachers have not always been welcoming to invite others into their schools to critique their work and offer suggestions, especially in low-income areas, where full service schools are typically cited as being most necessary (Abrams & Gibbs, 2000).

Full service schools invite school staff to take on a new role—as a partner for parents, community members and agency workers. Rather than excluding, school staff invites others into the school with open arms, realizing that the school and its children need many perspectives in order to thrive (Abrams & Gibbs, 2000; Curtis & Simons, 2007; Dryfoos, Quinn & Barkin, 2005). Administrators move towards including many voices in the planning process for the school and its functions. Decisions are not made and blindly followed, but rather families should have a voice in what occurs in the school. Teachers invite parents to understand what happens in the classroom, they show parents how to help their children with their homework, and they take a stake in the child's success. No one is viewed as being "in charge" because no one has all of the answers for what it takes to make a child successful (Abrams & Gibbs, 2000; Curtis & Simons, 2007; Mawhinney & Smrekar, 1996; Smrekar, 1998).

*Social Service Organizations* In addition to school staff, full service schools also need the assistance of staff from the various social service organizations that enter the school to provide services and resources. These commonly include medical staff and social workers, but may include adult education instructors, ESL teachers, and agents from various housing, immigration, and employment agencies (Curtis, 2007; Dryfoos, 2005, p.15).

In traditional schools, health staff usually consists of a nurse or two, and not much else. The nurse is there to tend to the minor needs of a child while he or she is in school. If a student

scrapes his knee while playing or if he falls ill during the day, he may visit the school nurse. In addition, nurses check a student's medical background to insure that he is in proper health to be allowed in school with other students. Otherwise, the school nurse does not engage in the health of the student too much. She does not take many preventative health measures, but rather responds to the immediate health needs of the child while he is in the school building. Because the nurse serves this role, students whose major health concerns are not taken care of before they enter the school building miss out on class time and work while their issues are being tended to (Brown & Bolen, 2003).

In a full service school, the health staff may consist of a nurse, a dentist, a physician, and even a psychologist. All of these people are needed because a child's health consists of many concerns and each agent tends to one aspect of the child's health. In addition, because a dentist or physician may be present, the child's preventative health care can be assured. Maybe the child hasn't gone to the dentist or doctor in a while because access to these services is difficult to attain. By putting all of these services in the school building, the student can visit the doctor or dentist by appointment like at a stand-alone clinic, and not miss time out of class because of a minor health issue that may have been remedied at a regular visit or that may have never occurred. School-based health clinics and dental services aim to tend to children's current health issues, but also to make preventative health care central to their programs (Albert, McManus, & Mitchell, 2005; Brown & Bolen, 2003; Jennings, Pearson, & Harris, 2000; Larsen, 2009).

Social workers are also important members of the full service school staff. In traditional schools, they usually serve as advocates for children who are identified as needing a mediator between the home and school. Social workers may visit with students in the school, or visit both the students' home and school in order to build a bridge and begin to solve some of the problems that exist. In the full service school, a social worker serves as a mini lead-agency. Each social worker is usually paired with a manageable number of student and family cases—maybe about fifteen to twenty total families. The social worker can connect the little pieces to the problems that exist for the student. While many services may be available at the school and useful for the larger student population, the social worker tends to the needs of individual students and families (Blank et al., 2008; Curtis, 2007; Dryfoos, 2005, p.107).

As previously mentioned, depending on the types of services and programs that are offered at the full service school, the staff and its role varies. Many full service schools not only include services for its students that go beyond the traditional academics, but they also include services for families and for the general community. Often times, these services are related to the wellbeing and academic achievement of the student such as parenting classes, afterschool academic enrichment programs and summer camp, but many full service schools offer services that are not directly related to the students' academic achievement; rather, the services are meant to foster relationships and development in the community for individuals and between common residents.

In areas with large immigrant populations, full service schools often contain English as a Second Language (ESL) classes for students and all community residents. Schools may provide childcare for parents so they can go to work or attend programs at the full service school such as pottery, cooking, writing, and GED classes. The list of people who are involved in the full service school is virtually endless because it depends largely on the specific community and its needs and the services that are made available to community residents (Blank, 2004; Kirkner, et al., 2008).

*Parents* Traditionally, parents are recognized for their role outside of the school. They take care of the child's needs at home and prepare him for school. Once he goes into the school, the parent follows the rules of the school and interacts with the school staff and builds a relationship as the parent, separate from the school or from the people in the school. This means that parents often don't have a say in what occurs in the school. Some schools have a Parent-Teacher Association (PTA), but even the PTA has boundaries. In a traditional school, parents do not typically have a real say in the school's policies, whether they are related to curriculum, behavior, or dress code (Abrams & Gibbs, 2000; Kirkner, et al., 2008; Schutz, 2006). They may offer opinions, but these opinions are usually in response to the established practices of the school. Parents do not sit at the planning table with teachers and administrators and make big decisions. The reasoning behind this may simply be that parents don't have the expertise to decide what their children should learn, who should be the principal of the school, or how achievement should be scaled. This divide is especially great in low-income areas where parents feel that teachers and school administrators don't seriously consider their input because of their lack of education or income (Abrams & Gibbs, 2000; Schutz, 2006).

This may be true, but in a full service school, a parent's opinions are crucial to the mission of the school. Parents are not only to become involved in the school for the sake of collaborating with their children's teachers on plans for their children's educational success, but rather parents are supposed to become deeply connected to the school. Parents can also take advantage of classes and services available in the school. Parents can serve as liaisons between the school and community organizations. Parents should become invested in the school so that the success of the entire school, not just of one's own children, is important. The full service school is typically concerned with the wellbeing of the community, so parents' input is absolutely necessary for the school to create goals and then meet them (Abrams & Gibbs, 2000; Gareau & Sawatzky, 1995; Kirkner, et al., 2008; Terreon, 2006).

*Students* In traditional schools, students are expected to obey the rules and absorb material. Most traditional schools don't seriously take into account that if a student is hungry or tired, or worried about an issue at home, he or she cannot focus on the material that the teacher is presenting. The full service school aims to tend to all of the needs of the child. The student then can truly focus on his role in school which is to receive the academic material, discover interests, and interact with his peers (Schutz, 2006).

In some full service schools, an important element is that students truly serve as actors—they may have a hand in the planning process of the school by articulating what they feel should be included in the school—whether it is a certain course that should be taught or a service that should be available. It is also important that students do not simply absorb material as they are typically expected to do in traditional schools. A full service school is supposed to foster healthy development for students so they should be involved in what occurs in the school, not just merely observe and consume (Canada, 2001).

*Community Members* Because full service schools are often open to the community, it is expected that various community members will be involved in the planning process of the school and also benefit from the services that are provided. University students are a common example of community members who are involved in the full service school. Some students are involved because their universities are involved in partnerships with the school for a number of reasons—as lead agency, to provide teachers for courses, to find a case for students' studies, and for many

other purposes (Murtadha-Watts, 1999). Students also serve as volunteers to help out with various programs, depending on their field of interest. Other community volunteers also often help in the full service school, depending on their skills and where they are needed the most. The full service school, ideally, serves as a hub for community activities and neighborly gatherings (Canada, 2001; Hackman & Walker, 1999; Kirkner, et al., 2008).

## Actors in CAS Community Schools versus Actors in Comparison Schools

While many of the actors in full service schools are the same as the actors in traditional schools, these actors play a very different role in community schools than they play in other schools. As described in the previous section, there are also actors who are not typically seen in traditional schools such as dentists and mental health care professionals. This section focuses on select actors: parents, the lead agency, and social service organization workers, and how they function in IS 218 and PS 5. Parents were chosen because ideally, they serve a greater role in community schools than they do in traditional schools. The lead agency was chosen because it is central to the CAS community school model in order to facilitate collaboration between other actors, and the social service organizations were chosen because they create one of the greatest differences between CAS community schools and the comparison schools. These organizations provide the services that allow the schools to be classified as *full service.*

*Parents* At IS 218, parents are invited to come into the school on any terms, not just those set forth by the school. Parents are involved as volunteers and as paid workers. A parent coordinator serves as a liaison between parents and the school and may be either a parent or a graduate of the school. In addition, parents serve on a parents' committee and are involved in the decision-making processes of the school (American Youth Policy Reform, 2006; Dryfoos, Quinn & Barkin, 2005, p. 43). At PS 5, parents take advantage of parenting classes, serve on a parents' committee, and have decision-making power in the school for programs that should be offered and services that should be available. At both schools, a family resource center is arranged like a living room with comfortable chairs, plants, and brewing coffee (Dryfoos, Quinn & Barkin, 2005, p.77).

*Lead Agency* In IS 218 and PS 5, the Children's Aid Society aimed to be a partner, not a rescuer to save the schools from all of their problems, and not a bully to force the schools into accepting a host of programs that were perceived to be beneficial for students and families. In this case, the area Board of Education gave CAS a considerable amount of power to make decisions within the schools and control the changes that occurred. With this power, CAS decided that it never wanted to exclude any organizations or other actors, especially since its goal was always to foster communication between actors in the children's lives. CAS puts a community school director in each school who serves as a point of contact for the principal, parents, school board superintendents, and other actors in students' lives. CAS also offers professional development and training for its workers and aims to assure that everyone works together to benefit the children (Dryfoos, Quinn & Barkin, 2005, p. 28).

*Social Service Organizations* Social service organizations are present in the CAS schools more commonly than they are present in traditional schools and in the two comparison schools PS 152 and IS 52. Both IS 218 and PS 5 offer a number of health services to students and communities.

Residents can visit the schools for a dentist visit or to visit a mental health professional. Social workers refer parents to housing or nutrition services within the school building or at a nearby community organization. Services are available depending on the needs of residents and on the focus of the school. Parents can take adult education classes and receive help obtaining employment through various programs at both schools (The Children's Aid Society, 2006).

## Outcomes: Successes

The idea of full service schools sounds compelling and when put into action, it may appear that all of the pieces fit together to meet the goals of full service schools; however, it is important that the schools actually match up to the goals that they are expected to meet. The Fordham University evaluations show that CAS community schools have been successful in a number of areas. Overall, parents, students, school administrators and teachers feel that the atmosphere of the community schools is positive. Academic achievement has increased, parental involvement has improved significantly, and many community members are taking advantage of the services that are available in the schools. This section outlines the successes in the areas of academics, community and parent engagement, and student health in IS 218 and PS 5. Some of the successes relate the community schools to the comparison schools as outlined in the Fordham University evaluations.

*Academics* The Fordham University evaluations show that both IS 218 and PS 5 had considerable improvement in academic achievement within the first few years of the program. At PS 5, the study followed a group of students who were in the third grad in 1993. In the first two years of the community school programs, students' reading and math scores increased tremendously. Reading scores started at 10.3% proficiency and increased to 16.2% proficiency in 1994 and 35.4% proficiency in 1995. Math scores increased in those two years as well from 23.3% proficiency, to 32.1% and finally 56.0% in 1995(American Youth Policy Reform, 2006; Dryfoos, Quinn & Barkin, 2005). At IS 218, eighth grade students' writing competency scores were compared to the scores of students at the comparison school IS 52. Even though the schools were demographically similar and students started on similar levels, after the implementation of community school programs, IS 218 students were 79.3% proficient on the exam while students at IS 52 were 64.2% proficient(American Youth Policy Reform, 2006; Dryfoos, Quinn & Barkin, 2005). At both schools, the number of academic enrichment programs that students attended positively correlated to their academic achievement in the classroom.

*Community/Parent Engagement* Another indicator of success of the community school programs is the significant increases of community involvement in the schools. At PS 5, parents and other community members felt more welcome in the school than they had previously. As a result, parental involvement was 78% higher than in the comparison primary school PS 152. At IS 218 parent involvement was 147% higher than in the comparison school IS 52. Parents also took more responsibility for their children's success. They said that they felt the school was a special place for their children to go (American Youth Policy Reform, 2006; Dryfoos, Quinn & Barkin, 2005).

*Student Health* The number of health programs available at IS 218 and PS 5 were an improvement from the previous programs in the schools and school staff and community

members noted a significant advantage to having the services available in the school. In both schools, CAS is able to provide almost all of the services that students need within in the buildings. Staff spans many disciplines and are able to cater to students' medical needs (Dryfoos, Quinn & Barkin, 2005, p. 91). At IS 218, $250 is allotted to the school for each student's medical needs and Medicaid covers most other fees for services that are provided (Dryfoos, Quinn & Barkin, 2005).

*Overall* As described previously, students at both PS 5 and IS 218 have experienced many positive outcomes as a result of attending a CAS community school in three areas: academic achievement, parent and community engagement, and student health. In addition, many other aspects of the schools and of students' lives have seen positive results. At PS 5, students differ in appearance and behavior than previously, and they have a better attitude towards school. At IS 218, incidences of violence and graffiti were almost at zero and attendance improved greatly. Compared to IS 52, attendance at IS 218 was at 90% —5 % higher than at IS 52 (Dryfoos, Quinn & Barkin, 2005, p. 169).

## Issues that Arise in Full Service Schools

The most common issues that are encountered in the planning of full service schools and in the implementation of the plans deal with leadership, the restructuring of the schools and social service organizations, and sustainability. When considering leadership, actors in the schools are concerned with who should lead and who is allowed to make decisions. When considering the structures of the schools and social service organizations, actors must consider how the current structures of the systems will be rearranged to meet the community schools' goals. Sustainability involves how long the programs will be able to continue and how well the programs can be duplicated and successful in different places and at different times. This also relates to funding and the availability of funding.

*Leadership* An issue that arises often in the formation of full service schools and in the implementation of their policies is who should lead in the school. Because there are so many actors in the school—administrators, teachers, the school district, the directors of various service programs—it is difficult to create a system where someone oversees what everyone else is doing. In a traditional school, people think of the principal as the leader of the school and in charge of everything that happens. Department heads oversee the details of academics in their given areas, teachers lead in their classrooms, and everyone else falls into place whether they are leading or following. In a full service school the structure is so different from the structure of a traditional school that it is not so simple to say that the principal should be "in charge" of everything(Abrams, 2000; Dryfoos, Quinn & Barkin, 2005, p. 130).

Many full service schools operate through the facilitation of a lead agency. The lead agency will likely have a general director and then directors in charge of the various services that are offered in the school. In this case, there is no single person that anyone can look to for direction or advice because everyone has something to offer. The lead agency director can offer information for a broad overview of programs in the school and of interactions between different departments, but the directors of the various service programs can give detailed information regarding specific services. At the same time, the principal, academic department heads, and

teachers are still operating and working around what happens in the classroom. A conflict can often arise here (Dryfoos, Quinn & Barkin, 2005).

In reality, it is not necessary to have one single leader. Everyone can be a leader and no one can be a leader. Because everyone in the full service school may have a single area of the child to focus on, the work that is done is not necessarily hierarchical. Rather, people interact in order to fulfill the goals of the school. Also, in order for the full service school to look at the child holistically, it is necessary for interaction to occur across the board without anyone feeling as if their approach to the child is insignificant or lesser than someone else's approach. After all, the purpose of the full service school is to attack the problems that plague the child's life all at once, instead of one at a time and in an uncoordinated manner. Because of this, no one has to be the supreme leader. Of course it is necessary for someone to look at the big picture and to always refer back to the master plan—the big goal of the school, but that person does not have to rule over everyone. In a full service school, those who are working with the students every day, following the school's policies laid out by a committee that sits in a large office far away may have more to offer for the planning process because of their hands-on experiences. The full service school ideally invites everyone's input because everyone has a different outlook on the best approach to making children successful (Abrams & Gibbs, 2000; Trepanier, Pare, Petrakos, & Drouin, 2008).

*Restructuring* Another conflict arises from the existing structures of the various agencies involved in the school. Agencies often attempt to maintain their structures in order to preserve themselves. Thus, if by combining with other agencies, one aspect of an agency may be eliminated, it is likely that the agency will not collaborate wholeheartedly with other agencies. By including a health services center in the school, this may eliminate the need for a nurse who is available for some number of hours during the day to tend to minor health issues. If a physician is available to deal with a problem directly, the nurse may not be needed to quell the problem. By allowing parents to join in the original planning of the school, those who are typically in charge of the planning might not like the idea of this new structure—including parents and other community members in the school. By offering adult education courses and helping parents secure employment, hunger may become less of a problem so the company that typically supplies lunch to the school may no longer be needed. Changes that at first seem insignificant can have a huge impact on those previously and currently involved in the school and addressing conflicts that arise out of these changes is crucial when planning a full service school (Crowson & Boyd, 1996; Mawhinney & Smrekar, 1996; Smrekar, 1998).

*Sustainability* When considering CAS community schools, the issue of sustainability deals with a number of components. The first component involves how long the CAS schools currently in operation can continue to operate and be successful in reaching the goals that the school originally set out to meet. Some elements that the Children's Aid Society believes are crucial to its model are: a focus on education, collaboration between the various actors in children's lives, and intense parent and community engagement. Not only should schools continue to focus on these elements, but schools should be improving in these areas. If student achievement increased at the beginning of the program, then the best case scenario involves continued increases in student achievement. It is important then, that community schools already in operation stick to these objectives as the programs continue and the years go on (Dryfoos, Quinn & Barkin, 2005, p. 193; The Children's Aid Society, 2001).

A second component is whether or not the model of CAS community schools can be transferred to new schools in other locations and with different student demographics. Again, the schools should focus on the central goals of CAS community schools; however, without the same structures already in place, it may be difficult for the system to work the same way in a different place. Various full service programs exist around the country and some have looked to the CAS community schools as a model for how their schools should be run. More time will tell how successful these efforts have been.

The third issue that arises when discussing sustainability is how to fund the schools' services and community programs. Depending on the school and the area in which it is located, as well as the services that are offered, money is provided by a number of sources. The money may be money that was originally allocated to the school for academic programs from the state as well as money that was allocated to various social service agencies to provide the services that they typically offer. Money also comes from various foundations and private agencies as well as grants or money that is reserved for programs such as those that can be found in full service schools which focus on community development and academic achievement amongst other things (Annie E. Casey Foundation, 2009; Dryfoos, Quinn & Barkin, 2005, p. 168; W.K. Kellogg Foundation, 2009).

The money then may be applied to various parts of the school depending on what the money was originally given for. Some money is solely for academic programs while other money is solely for health services or adult education courses. The way in which money is used is completely dependent upon what works best for the given full service school and those involved in the school. Typically, money that was originally used for academics is used for academics; the various social service agencies bring money over for their services to be offered in the school, and additional money is secured to cover other costs that have not been taken care of (Sullivan & Sugarman, 1996).

## Conclusion

Given the purpose of full service schools, those involved in the school, and how they work together to achieve that purpose, one can explore given cases in order to develop solutions to common conflicts that arise, to bypass conflicts altogether, or to simply learn about how to better plan for the school. In order to accomplish the goals of the full service school, those involved have to keep a few things in mind—the explicitly decided upon goals of the school and the fact that many people are needed to reach those goals. The full service school's success is built upon the successful implementation of its plans and upon the reaching of its goals. If the full service school is mostly focused on offering medical and dental services, then those involved must constantly refer back to those goals when making plans and carrying them out. Smaller issues that arise out of the school or its structure become less significant.

As demonstrated with IS 218 and PS 5, the results of converting the schools to community schools were positive and fairly significant. The schools saw improvement in students' academic achievement, parental involvement, and available health services. In addition, students' attitudes, behaviors, and attendance improved greatly. However while these successes are significant, there is still much research that needs to be done in the area to further explore full service schools and the effects that they have on students, schools, and communities. That research involves not only recording the outcomes of the programs for students but also

considering if programs are sustainable and continue to have considerable positive results over time. It is also important to examine whether given models and programs can be implemented elsewhere. Future projects may also focus on the positive results as they relate to all school programs such as medical services and academic enrichment as opposed to revised teaching methods and changes made that directly affect academics. It is important to discuss all of these issues in order to fully understand the aspects of full service schools that can be successful and the aspects that need to be reformed. With more studies in the area, it will become more clear the effect that full service schools have on communities and what this means for students and their families.

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# *Emotion regulation and well-being among Puerto Ricans and European Americans*

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## Abstract

This study examined emotion regulation and well-being differences and the relationship between these two constructs among 182 European Americans and 266 Puerto Rican students. In this context, emotion regulation refers to expressive suppression (hiding emotions) and cognitive reappraisal (thinking about a situation differently). Prior research has shown that minorities in the U.S. are more likely than European Americans to suppress and that frequent use of suppression is linked to decreased well-being, while frequent use of reappraisal is linked to increased well-being. These relationships have not previously been examined among Latinos who are in a majority context (i.e., Puerto Rico). Our results concluded that Puerto Ricans engaged in cognitive reappraisal more compared to European Americans while no significant difference was found between the two groups regarding expressive suppression. Furthermore, we found no evidence for culture moderating the relationship between emotion regulation and wellbeing. These results were contrary to our hypotheses, but suggest a need for further research on this topic.

## Introduction

Interest in how emotion regulation impacts different aspects of an individual's life is growing within the scientific field of psychology. Everyone experiences emotions--regardless of age, gender, and race-and those emotions are often managed, checked or otherwise altered to meet our needs. The present study focuses on these various strategies and how their use is related to important individual and group differences. Before turning attention to emotion regulation, however, it is important to define what emotions are and what they do.

Different definitions of emotions have been proposed by various researchers. Gross (2002) states that "emotions call forth a coordinated set of behavioral, experiential, and physiological response tendencies that together influence how we respond to perceived

challenges and opportunities." This statement highlights the psychological and physiological aspects associated with emotions. One of the most well-known studies of emotion, carried out by Paul Ekman and his colleagues, also focused on these two aspects of emotions: universal facial expressions (physiological) and rules and strategies for altering these (psychological). Ekman (1987) posited the existence of universal facial expressions for six basic emotions: anger, disgust, surprise, happiness, sadness, and fear. Subsequent research has supported this assertion (Ekman's,1971, 1979)

Ekman also left room for cultural variability proposing the notion of display rules as a mechanism for people within different cultures to modulate their expressions (Ekman, 1979). Ekman's research provided the foundation for further research in emotions and how emotions are expressed (and possibly controlled) similarly and differently across cultural contexts. His neurocultural theory of emotions (1979) paved the way for research on emotion and culture and may be seen as the beginnings of research looking at how the regulation of emotion can differ across cultures in ways to help individuals function and interact with others within their particular society. This study examines the way in which cultural background influences the use of emotion regulation strategies and how those strategies affect the well-being of an individual within that particular culture.

*Culture and Emotion Regulation*

Although Ekman suggested that facial expressions may be the same across cultures, he suggested that emotion regulation should be the focus of cultural variation. Culture provides a system of values, ethics, moral beliefs, and other information that can influence how, when, or where emotions are shown (Matsumoto, Yoo, & Nakagawa, 2008). These rules or meaning systems allow members of a group to function at its highest potential within that culture and therefore allows the group to survive, pursue happiness and well-being, and to concoct their own personal meaning of life. Every culture has a set of norms about what is considered to be desirable and undesirable behavior and emotions that are connected to display rules (Matsumoto, 1990, Matsumoto & Ekman, 1989). Matsumoto & Ekman defined display rules as "learned, culture specific rules governing the management of and control of emotional expression in specific social contexts. Of course, different cultures display and value emotions differently. These display rules may vary along with various other dimensions such as the I-C dimension (individualism-collectivism). In an individualistic culture, emphasis is placed on meanings and practices that are unique and valued to the individual (Mesquita, 2001). In a collectivistic culture, meanings and practices that are based around the general well-being of the in-group are emphasized. For example, Soto, Levenson and Ebling (2005) argue that in Chinese culture emotional control and being able to know when to show (or not show) emotions is considered a positive attribute. Accordingly, Chinese culture may encourage suppression in order to maintain a positive group image. This is different compared to European American culture where hiding emotions is not emphasized. Different ethnic or cultural groups may hold different emotion display rules. Display rules are defined as "learned, culture specific rules governing the management of and control of emotional expression in specific social contexts" (Matsumoto & Ekman, 1989).

Emotions may also be viewed differently in individualistic and collectivistic cultures. For example, Mesquita (2001) describes emotions in collectivistic cultures as stressing and reinforcing the self in relation to in-group members. In individualistic cultures, emotions are a reflection of the self and do not enforce the collective identity of groups to which the individual

belongs. Groups that fall under a collectivistic or interdependent culture are Japanese and other Asian cultures, African tribes, and different Latin American groups (Markus & Kitayama, 1991). Another difference that has been empirically demonstrated is that Americans are much more likely to report feeling positive emotions than Japanese (Kitayama, Markus, & Kurokawa, 2000). This particular finding is consistent with other studies concluding that individuals in individualistic cultures are more likely to have higher levels of subjective well-being compared to members of a collectivistic culture (Diener & Diener, 1996; Oishi & Diener, 2001). In addition, similarities exist between individualistic and collectivistic cultures. Results from a study conducted by Scollon, Diener, Oishi, and Biswas-Diener (2004) revealed that European Americans and Hispanics place great emphasis on pleasant and happy feelings that lead to feeling more pride compared to Japanese and other Asian American groups.

*Emotion Regulation and Health*

The use of the term emotion regulation above was used in the general sense, but there are many ways to think about how to define emotion regulation because there are different aspects that affect emotion regulation both psychologically and physiologically. More specifically, emotion regulation includes all conscious and unconscious strategies we use to decrease, increase, or maintain different components of an emotional response during an emotion eliciting situation (Gross, 2001). It is the ability to manage personal emotional reactions during a situation to have some sort of individual gain (Matsumoto et al., 2008). Emotion regulation strategies are classified as antecedent focused or response focused strategies (Gross & John, 2003). Antecedent focused strategies are summarized as the things individuals do before emotion responses are activated to the maximum potential and have changed the individual's behavioral response. Response focused strategies are explained as the things an individual does after an emotion is elicited.

The two most commonly studied emotion regulation strategies are cognitive reappraisal and expressive suppression (Gross, 2002). Cognitive reappraisal is defined as a form of change in an individual's cognitions during a situation that elicits emotions in order to alter the emotional impact that the individual experiences. It is a matter of changing one's thoughts in order to view the situation as a more positive experience with better outcomes. Cognitive reappraisal is used to eliminate negative emotion and the behaviors associated with negative emotion. Reappraisal happens early on after consciously evaluating a situation.

Expressive suppression is defined as inhibiting behavior that is emotionally expressive in situations in order to achieve a specific outcome (Gross, 2002). Expressive suppression occurs after reappraisal to alter behavioral responses of negative emotions. This behavioral response can be classified as a response focused strategy because suppression occurs after an emotional response has been evaluated (Butler, Egoff, Wilhelm, Smith, Erickson, & Gross, 2003). Individuals who frequently engage in suppression experience and express less positive emotions compared to an individual who uses cognitive reappraisal (John & Gross, 2004). Therefore a clear association exists between using suppression and experiencing more negative emotions.

These particular emotion regulation strategies have been shown to impact other areas such as health and well-being. For example, Gross and Levenson (1993) reported a correlation between expressive suppression and an increase in sympathetic activity of the cardiovascular system. This included increases in blood pressure. In another study by Roberts, Levenson, and Gross (2008), results were found supporting the conclusion that suppression leads to more health risks involving the cardiovascular system. Another important finding from this study was that

ethnic minorities, who engage in suppression more than European Americans, are at higher risk for poor health outcomes especially those that deal with the heart. Suppression was linked with increases in the cardiovascular system including an increase in blood pressure (Roberts et al., 2008). Emotion regulation can also be a reliable predictor of well-being. A study conducted by Gross (1998), revealed that using antecedent strategies such as cognitive reappraisal was positively related to well-being. These results suggest that achieving a healthy well-being may be promoted by frequent use of cognitive reappraisal, but not suppression.

*Emotion regulation, Well-being, and Culture*

Usage of emotion regulation strategies and how often they are used in certain contexts may also differ depending on culture. The literature on emotion regulation and culture is limited to few ethnic groups and contains many gaps regarding differences in emotion regulation among cultures. The most common cultures examined regarding emotion regulation are Japanese Americans, Chinese Americans, Hispanics (mainly Mexican Americans), and European Americans. For example, one study that looked at the relationship between emotion regulation and culture used this relationship to determine if recognition of emotions and emotion regulation has a significant impact on intercultural adjustment in a sample of participants from different Asian backgrounds (Yoo, Matsumoto, LeRoux, 2006). In order to have a positive intercultural adjustment experience, it is important for the individual to use emotion regulation and to be able to recognize emotions in a different cultural context. Matsumoto and his colleagues (2008) examined emotion regulation within different countries using country-level data. Results implied that suppression can have some positive consequences such as maintaining a social life in order to function at a particular culture.

One particular study did examine emotion regulation and the relationship with culture and how emotion regulation impacts other areas such as health and well-being as previously mentioned. Gross and John (2003) focused on four major ethnic groups for their study on emotion regulation and culture. The groups consisted of African Americans, Asian Americans, European Americans, and Hispanics. They studied how these different ethnic groups used and evaluated cognitive reappraisal and suppression. Results showed that European Americans used suppression the least compared to the other minority groups. Across four ethnic groups, men used suppression more than women, suggesting that a gender difference exists in relation to engaging in certain emotion regulation strategies. However, no gender difference was reported in the usage of cognitive reappraisal.

Mental health and well-being may also differ according to culture (Robitschek & Keyes, 2009). Psychological well-being refers to the degree that an individual has a sense of self-acceptance and purpose in life. Psychological well-being has proven to be correlated with life satisfaction and happiness but neither is considered an indicator of well-being (Ryff & Keyes, 1995). Gross and John (2003) found that when participants used more suppression, they scored lower on the satisfaction with life scale suggesting that there is a relationship between using emotion regulation strategies and satisfaction with life.

As mentioned before, the research that analyzes culture and well-being included very few ethnic groups. Ryff's study (1989) did not include participants from any ethnic minority background. From a psychological standpoint, little research is conducted with Hispanics regarding how well-being and emotion regulation are related to cultural factors. Gross and John (2003) had a small percentage of participants that were Hispanic but to this date, there has not been a study where Hispanics were analyzed and compared against another ethnic group such as

European Americans in terms of emotion regulation and well-being exclusively. The purpose of the current research is to uncover similarities and differences concerning Hispanics and European Americans from a psychological perspective.

We have demonstrated that emotion regulation strategies can have a meaningful impact on an individual's well-being and that culture can have a meaningful impact on how an individual regulates their emotion. In Gross and John's study (2003), out of the four ethnic groups, European Americans were the least likely to use expressive suppression. This project focuses on how Latinos and European Americans differ in the use of emotion regulation strategies such as cognitive reappraisal and suppression, in addition to looking at differences in the relationship between well-being and emotion regulation across these cultural groups.

*Hypotheses*

Based on the previous research on emotion regulation and ethnic minorities, this study will examine the association between emotion regulation, culture, and well-being. The following hypothesis will be tested:

I. Puerto Ricans will report a greater tendency to engage in expressive suppression compared to European Americans.

II. Puerto Ricans will not differ in their tendency to engage in cognitive reappraisal when compared to European Americans

III. We expect that culture will moderate the relationship between emotion regulation and well-being. Specifically, we expect that:

a) culture will moderate the relationship between cognitive reappraisal and well-being and that

b) culture will moderate the relationship between expressive suppression and well-being.

## Method

*Participants*

The total sample for the study consisted of 448 undergraduate students of European American background (n=182) and Puerto Rican nationality (n=266), who were enrolled at the Pennsylvania State University and the University of Puerto Rico, Mayagüez respectively. The mean participant age was 19.82 for the Penn State students and 20.3 years for the Puerto Rico students. The percentage of participants who identified their gender as female was 61% for the Penn State students and 57% for students from the University of Puerto Rico. The percentage of participants who identified as male was 39% for students at Penn State and 42% for students at the University of Puerto Rico. However, 1% of the participants from the University of Puerto Rico did not respond to the gender question.

*Measures*

*Scales of Psychological Well-Being* (SPWB; Ryff, 1989; Ryff & Keyes, 1995)

The SPWB consists of 84 items that measure well-being across different domains of an individual's life. The six subscales included are: autonomy, environmental mastery, personal growth, purpose in life, self-acceptance, and positive relations with others (Ryff, 1989; Cooper, Okamura, & McNeil, 1995). High and low scores in each dimension of psychological well-being reflect higher or lower psychological well-being in each subscale (Ryff & Singer, 2006). *Autonomy* revolves around the idea of independence and to extent to which individuals depend

on themselves for approval instead of depending on others for their approval. *Environmental mastery* captures the extent that an individual is able to successfully deal with and cope with various situations that may arise in their environment. *Personal growth* is described as an individual growing and continuously developing their unique talents and abilities. Personal growth is correlated with high motivation in an individual. *Purpose in life* refers to the idea that an individual needs to have a goal or a general direction in life that they wish to fulfill. Purpose in life is highly correlated with positive mental health (Ryff & Singer, 2006). *Self-acceptance* refers to having positive attitudes and feelings about oneself and is essential to healthy psychological functioning. *Positive relations with others* focuses on the degree of warmness, supportiveness, caring, and trustfulness of a particular relationship (Cooper et al., 1995). The scale consists of a total of 84 items with internal consistency for each 14-item scale ranging from .82 to .90 (Ryff, Lee, Essex, & Schmutte, 1994). The test-retest reliability over a 6 week period ranged from .81 to .88. In addition, divergent and convergent measures with other measures of well-being have demonstrated that Ryff's SPWB is valid and reliable (Ryff, 1989). For the present study, a composite psychological well-being score was calculated for each participant from the sum of the standardized scores (z-scores) from each of the individual subscales. Thus, instead of examining six separate dependent variables, we used on a super factor which represented all the scales in single dependent variable.

*Emotion Regulation Questionnaire* (ERQ; Gross & John, 2002)

This scale uses 10 items such as "I control my emotions by changing the way I think about the situation I'm in," and "I control my emotions by not expressing them," to measure the emotion regulation strategies of cognitive reappraisal and suppression. The ERQ uses a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) for each of the statements. The average internal reliability (alpha) for statements examining cognitive reappraisal was .79 and the average internal reliability for suppression was .73. For both cognitive reappraisal and suppression, test-retest reliability across three months was .69.

*Procedures*

Students from the University of Puerto Rico, Mayaguez were recruited through the use of an email distributed via a listserv to students on campus. The recruitment email included a link to the online questionnaires.. Students from the Pennsylvania State University registered for this study through the psychology subject pool that included a mass screening. Afterwards, participants were given a link to the online survey to register for and to complete the survey. The questionnaires took approximately one hour to complete. Participants from Puerto Rico were paid $8 for their participation and those at Penn State received course credit for their participation. Once the questionnaire was completed, participants were given a debriefing form that contained contact information and explained the nature of the study.

## Results

An independent samples *t*-test was used to test hypothesis 1 that Puerto Ricans would report greater habitual use suppression than European Americans (see table 1). An examination of the mean ERQ suppression scores revealed that European Americans reported using suppression ($M$ = 13. 21; $SD$ = 4.70) at levels similar to Puerto Ricans ($M$ = 13.54; $SD$ = 5.83). The Levene's test for equality of variances between the two groups showed a significant

difference, $F = 7.07$, $p < .01$. After correcting for inequality of variances, the difference between Puerto Ricans and European Americans mean suppression score was not significant, $t(433) = -0.65$, ns, therefore hypothesis one was not supported.

In addition to suppression, cognitive reappraisal was predicted to not be significantly different between Puerto Ricans and European Americans. Looking at mean reappraisal scores, a small difference was observed between Puerto Ricans ($M = 30.96$; $SD = 6.92$) and European Americans ($M = 29.26$; $SD = 5.14$). Once again, the Levene's test for equality of variances showed a significant difference between the groups, $F = 14.676$ and $p < .001$. After correcting for inequality of variances, the difference between Puerto Ricans and European Americans use of reappraisal was significant, $t\ (441.5) = -2.98$, $p < .01$. These results were contrary to predictions and consequently we rejected Hypothesis II. The effect size for the mean difference in cognitive reappraisal between groups, d = -0.28, represented a small to medium effect size.

To test for the interaction between emotion regulation and culture in predicting well-being, multiple hierarchical regression analyses were used. Separate hierarchical regressions were conducted to examine whether culture moderates 1) the relationships between cognitive reappraisal and wellbeing and 2) the relationship between suppression and wellbeing. The dependent variable for both of these analyses was our overall well-being composite score based on the sum of the standardized Ryff's well-being subscale scores.

To test for cultural moderation between reappraisal and well-being we included ethnicity and cognitive reappraisal scores (centered) as predictors in step 1 of a regression model (see figure 1). This model suggested that reappraisal and ethnicity, combined, account for a significant amount of variance (10%) in the well-being composite score, $F\ (2, 443) = 25.94$, $p < .01$. Step 2 of the hierarchical regression included the interaction of reappraisal and ethnicity as the third predictor. The addition of the interaction term did not lead to a significant change in $R^2$, $F(1, 442) = .720$, ns, $R^2\Delta = .001$. Only an additional 0.5% of variance in well-being was accounted for by the interaction of ethnicity and cognitive reappraisal. Therefore, culture did not moderate the relationship between cognitive reappraisal and well-being.

To test for cultural moderation between suppression and well-being, we included ethnicity and suppression scores (centered) as predictors in step 1 of a regression model (see figure 2). This regression model suggested that suppression and ethnicity, combined, account for a significant amount of variance (9%) in the well-being composite score, $F\ (2, 443) = 24.150$, $p < .01$. In step 2 of the hierarchical regression model, the interaction of suppression and ethnicity were included as the third predictor. The addition of the interaction term did not lead to a significant change in $R^2$, $F(1, 442) = .003$, $p > .05$, ns, $R^2\ \Delta = .001$. Only an additional 0.8% of variance in well-being was accounted for by the interaction of ethnicity and suppression. Therefore, culture did not moderate the relationship between suppression and well-being. Based on the analyses of both hierarchical regression models, culture did not moderate the relationship between emotion regulation and well-being contrary to our hypotheses.

## Discussion

In this study, we examined cultural differences between Puerto Ricans and European Americans with regards to two emotion regulation strategies, cognitive reappraisal and expressive suppression, and differences between the two groups in the relationship between regulation and on well-being. This study filled a gap in the literature on Latino populations and emotion regulation. Unlike the samples and analyses that Gross and John (2003) used, our sample contained a large ethnic sample allowing us to study one ethnic minority group in detail. In general, we found few cultural differences between Puerto Ricans and European Americans and those we did find were contrary to our predictions.

*Expressive Suppression*

We expected that Puerto Ricans will report a greater tendency to engage in expressive suppression compared to European Americans. However, there were no differences in the usage of suppression between the two groups. In our study, Puerto Ricans and European Americans reported using suppression in similar amounts. One reason for this may be that the Puerto Ricans were sampled from Puerto Rico where they are the primary majority of the population. Hispanics from Gross and John's (2003) study were taken from a minority context and consequently may have been dealing with acculturation factors or societal demands that may have led to reporting more usage of suppression. In addition, regional differences must be taken into consideration because our sample came from two different universities in two distinctly different cultural contexts (Northern California versus Central Pennsylvania and Puerto Rico).

*Cognitive Reappraisal*

We expected that Puerto Ricans would not differ in their tendency to engage in cognitive reappraisal compared to European Americans given previous research showing that the use of cognitive reappraisal among minorities is comparable with the usage of cognitive reappraisal reported from European Americans. Results from this study contradict findings from previous research. In fact, we rejected hypothesis 2 because an unexpected difference emerged where Puerto Ricans reported using more cognitive reappraisal than European Americans. One reason for Puerto Ricans in this study to engage in reappraisal more may be because our sample only consisted of college students and the different pressures or situations that they must deal with even if they are the part of the majority ethnic group. Perhaps our results would have turned out differently if we sampled other groups besides college students in Puerto Rico.

*Emotion Regulation and Well-Being*

Our prediction of culture acting as a moderator between emotion regulation and well-being was not supported. We expected that the relationship between emotion regulation and well-being would be modified by culture. The fact that no moderation was found suggests a number of possible alternatives. First, it's possible that there are, in fact, no differences across cultures in the relationship between regulation and wellbeing. Another possibility is that personality traits or other variables not considered may be playing a more important role than culture. A final consideration is that culture may be interacting with a third variable that moderates its influence on this relationship. Future studies should examine possible higher level interactions with culture to test for such an effect.

*Limitations and future directions*

The present study has several limitations that are indicated in order to inspire future research in the areas of culture, emotion regulation, and well-being. From this study, it was implied that Puerto Ricans represented all Latinos but, of course, this does not reflect the true variability among Latinos. Instead of only sampling Puerto Ricans, it would be prudent for future studies to sample different Latino groups such as Mexican Americans, Cubans, Colombian and other Spanish speaking Second, the Puerto Ricans in the present study were from a majority minority context (i.e., minorities are the majority) and results may have turned out differently if the Latinos sampled were from a strictly minority context. Location (urban or rural setting) should also be a variable for future consideration as emotion regulation strategies may vary se based on social norms associated with rural or urban life. A final limitation of this study was that we did not examine gender differences either within and between cultures. Men and women may display or engage in their emotion expressivity differently and studying these gender differences across cultures is crucial to understanding differences regarding emotion regulation in different contexts around the world. Cultural norms for each gender exist within each cultural group and since emotion regulation strategies are used differently by men and women, it would be crucial to examine gender differences across cultures to better understand how men and women use emotion regulation.

Future studies should also consider the use additional measures such as the Rosenberg self-esteem scale since self-esteem is related to well-being. In addition, different constructs for well-being such as subjective well-being might be targeted in future studies in order to measures all facets of well-being. Subjective well-being is defined as a personal evaluation of an individual's life in terms of relationships, careers, progression towards goals, and experience of positive emotions (Diener, Sapyta, &Suh, 1998). Diener and colleagues argue that subjective well-being is a stronger indicator of well-being than Ryff's psychological well-being because it focuses more on values which allow for greater variation within cultures. In addition, future research should consider how emotion regulation is affected by being a member of a cultural minority versus the extent to which individuals experience their minority status. Lastly, it will also be important to determine how culture impacts the relationship between emotion regulation and mental health in a variety of populations.

In conclusion, it appears that culture plays a rather limited role in emotion regulation when considering Puerto Ricans and European Americans. In our study, Puerto Ricans and European Americans displayed similar tendencies to engage in emotion regulation strategies and the relationship between emotion regulation and well-being was also not affected by culture. The only difference between the two groups emerged on cognitive reappraisal with Puerto Ricans reappraising more than European Americans. This finding was unexpected but suggests that there may me a more complicated picture when it comes to the role of culture in emotion regulation. This study is only the beginning step necessary in gaining a better perspective on how this important emotional process differs across cultures.

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Table 1

*Mean Scores of emotion regulation and well-being by ethnic group*

*(Standard Deviations in Parentheses)*

| | Ethnic group | |
|---|---|---|
| Construct | European American | Puerto Rican |
| Cognitive reappraisal | $29.26_a$ (5.14) | $30.96_b$ (6.92) |
| Expressive suppression | $13.21_a$ (4.71) | $13.54_a$ (5.83) |
| Well-being | $-0.46_a$ (4.20) | $0.40_a$ (5.50) |

*Note*. Means in the same row that do not share a common subscript differ significantly at $p < .05$.

Figure 1

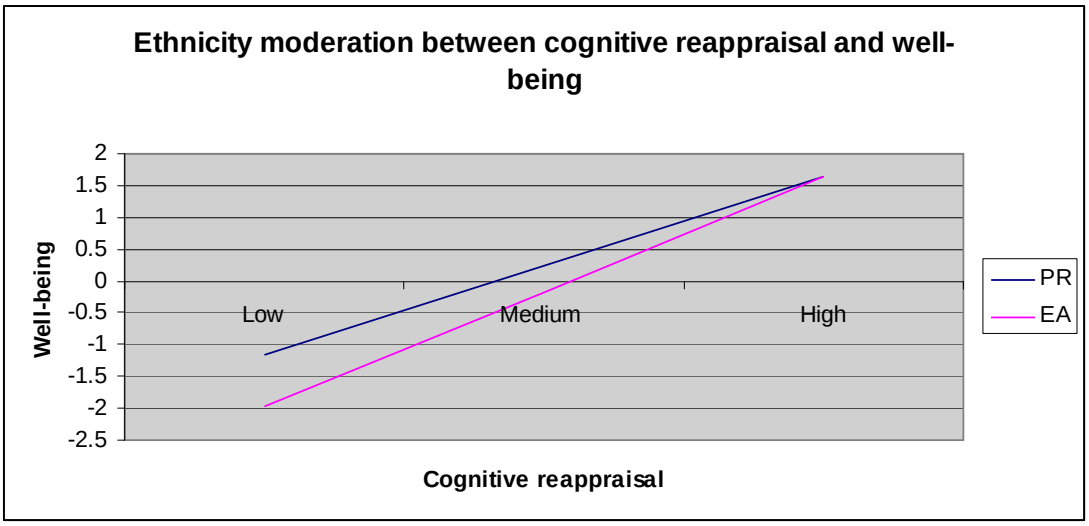
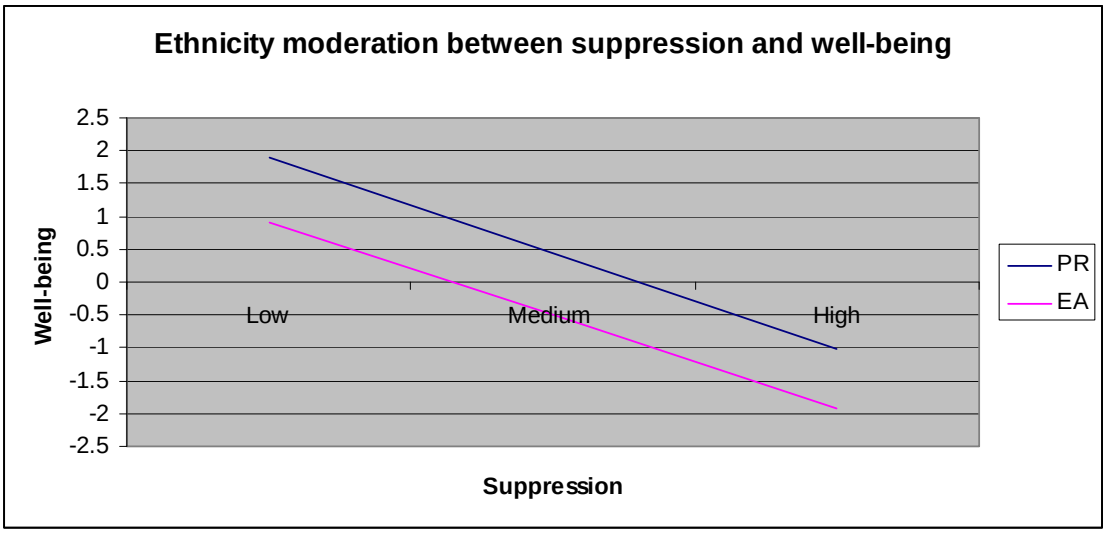



Figure 2



# *Social Geography, Minority Women and Public Health: Making Connections*

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*The purpose of this research is to address the health disparities that are prominent among minority populations, particularly African American and Hispanic/Latino American women. Cardiovascular disease is the leading cause of death for Americans along with diabetes. This research addresses the underlying causes for poor health among minority women in inner-cities. Social factors such as residential segregation and racism have not been accounted for as causes for poor health among minorities. Understanding the importance of these factors can lead to improvement in health care through implementation of policy which can benefit every American citizen.*

## Introduction

The primary purpose of this report is to explore the causes of poor health among minority women located in urban areas. Poor health among women of color is a consistent trend in the United States of America. While heart disease is the leading cause of death among all women in the United States, minority women, particularly African American and Hispanic/Latino women, suffer more from cardiovascular disease than White women. Poor health can be associated with socioeconomic status (SES), racism, poor dietary practices, and ethnicity. These connections are also related to the geographical location of these racial/ethnic groups, which are often concentrated in areas within the inner-city.

This report will concentrate on cardiovascular disease (CVD)/heart disease and diabetes mellitus (type 2) in a minority female population of West and North Philadelphia. Cardiovascular disease contains more than just one form of heart disease, with the majority of deaths coming from coronary heart disease. Ethnic and racial groups such as African Americans and Hispanic/Latino Americans have higher rates of heart disease than White Americans, as well as higher rates of mortality. Risk factors associated with heart disease include Type 2 diabetes, overweight/obesity, and high blood pressure/hypertension.

Millions of Americans are diagnosed with Type 2 diabetes. African American and Hispanic/Latino American populations have the highest rate of Type 2 diabetes along with a higher mortality rate when compared with White Americans. A chronic disease like diabetes is a

risk factor for cardiovascular disease. Diabetes is typically more prevalent in people of minority racial/ethnic backgrounds, and it is also influenced by family history, hypertension, overweight/obesity, and age.

An exacerbating factor is residential segregation within urban areas. By residential segregation, I refer to the spatial concentrations that reflect racial and economic patterns across urban neighborhoods. In this paper, I focus on the effect of residential segregation on the health of the minority populations that dominate inner city areas. Concentrating on urban planning and accessibility to health care, including to health insurance coverage, give better insight to the challenges that confront minority populations in inner cities.

The study exams the issues of residential segregation by focusing on Philadelphia, Pennsylvania, and concentrates on two areas of the city: West Philadelphia and North Philadelphia. West Philadelphia is predominantly an African American population and is characterized as a high poverty area. North Philadelphia has a high concentrated Hispanic/Latino population; both areas have high rates of uninsured and chronic illnesses. Residential segregation limits the ability to seek proper health care and proper nutrition.

The purpose of examining these two areas is to compare the segregated neighborhoods to the rest of Philadelphia. This geographic emphasis also focuses on connections linking health disparities with urban planning in conjunction with racism, particularly as it has contributed to segregation. By examining processes in urban geography in relation to the health of minority populations, this study will illustrate the importance of urban planning for public health.

A further objective of this study is to exam how socioeconomic status (SES) is an important aspect when observing the dynamics among race, sex and health disparities. The components of SES, income, education and occupation, determine the health of the population with regards to treatment and prevention. The relation between education, income and occupation is most often linked to the surrounding neighborhood. Those in the same income level have a tendency to live in the same areas.

In the following, I begin with an examination of the connections among urban planning and health, cardiovascular disease and diabetes. I then turn to a discussion of these issues as they affect the African American and Latina/o populations of West and North Philadelphia. I then conclude with some suggestions for improving urban access to medical care and educational information for inner city populations.

## Background

The United States is the leading world power and a prosperous nation. However, when comparing it against other countries in terms of the health of its population, the country lags behind all of the other developed nations such as Canada, United Kingdom and Japan. For instance, in the year 2007, the longevity of Americans trailed other developed nations with an average life expectancy of 78 years, in comparison to Canada with 81 years, United Kingdom with 80 years and Japan with 83 years (Organization 2009).

In this report, there are two diseases I will focus on that contribute to the low life expectancy of Americans, they include cardiovascular disease (CVD) also known as heart disease and Diabetes Mellitus, referring to it as diabetes. Cardiovascular disease is prevalent globally and is the leading cause of death for a significant percentage of the global population. For the countries mentioned above, information from 2004 was taken to view the mortality rate per 100,000 populations from CVD. The U.S. was last, yet again, for the highest mortality rate

per 100,000 with 179 deaths, in comparison to Canada with 131 deaths, United Kingdom with 175 deaths and Japan with 103 deaths (Organization 2009). Diabetes is also wide spread but less prevalent than CVD. However, in the U.S it is ranked as one of the leading causes of death. In the following, I will analyze how cardiovascular disease and diabetes affect the longevity of Americans, particularly minorities, and how the prevalence among minorities relates to their access of inner city populations to health care.

*General Health Information on the U.S. Total Population*

In 2005 the average age for Americans was 77.8 years at birth. Females live longer, on average, than males, for all countries. The average life expectancy for American females in 2005 was 80.4 years, in comparison to males at 75.2 years. CVD is the leading cause of death in the United States. The most common condition of CVD is coronary heart disease, which is the most prevalent. Coronary heart disease leads to conditions such as heart attacks. The number of deaths sustained in 2005 from CVD was 652,091; this is 26.6% of the population who died from heart disease alone. Females had a higher mortality rate than males. Of the number of deaths from CVD 50.5% were female and 49.5% were male. Within the White population, 26.9% of the deaths came from heart disease. A higher percentage of the deaths came from the males with 27.2% in comparison to 26.7% for females (see, Table 1 and Table 2). (Statistics 2009)

Diabetes is also considered a leading cause of death in the United States, as well as a high risk factor for heart disease as well as other health conditions. In the year 2005, the total number of Americans who died from diabetes was 75,119 which are 3.1% of deaths caused by diabetes. Females had a higher percentage of deaths from diabetes compared to males. Females consisted of 51.4% of diabetes deaths in comparison to males with 48.6% of deaths. Of the total population White males comprised 2.9% of deaths from diabetes while White females comprised 2.8% of diabetes deaths (see, Table 1 and Table 2). (Statistics 2009)

When examining the health data in relation to access to insurance coverage and healthcare, the data also reveal some important connections. For the year 2007, studies showed that 15.8% of the population lacked health insurance and of that percentage 10.4% were non-Hispanic Whites (DeNavas-Walt 2008), with the overwhelming majority of the uninsured being women in racial minorities. The data shows that lack of health insurance deters many minorities from seeking medical care, as well as establishing a primary care provider, which means that this population does not have access to the preventive care that can stave off the onset of devastating diseases

*Health of African Americans*

When observing the differences in life longevity between races I found that African Americans shadow White Americans about five years overall. The average life expectancy for African Americans, including both sexes, was 73.2 years, in comparison to White Americans at 80.8 years in 2005. When comparing males from both races the life expectancy for African Americans was 69.5 years, while White Americans lived to about 75.7 years. While females live longer than their male counterparts, White females live longer than African American females.

In 2005, the life expectancy of African American females was 76.5 years, in comparison to White females whose life expectancy was 80.8 years. The percentage of deaths from CVD was 25.3% for African Americans. Unlike the White American population, a higher percentage of females died from heart disease than males. Of the black female population 26.3% of the deaths were due to CVD, in comparison to 24.4% for black males. The percentage of deaths from diabetes is lower (4.4%) than that of heart disease. However, African American females continue to have a higher percentage rate (5.0%) of the disease than African American males (3.8%). (Statistics 2009)

The lack of insurance for African Americans is almost twice that of White Americans. In 2007 there was a percentage of 19.5% African Americans who were uninsured (DeNavas-Walt 2008). A large portion of the African American community lives in poverty. Clinics and health centers located in low income areas are more likely to have poor service and be understaffed. The quality of care given to minorities reflects their income and access to health insurance. It is understood that African Americans have poorer health when compared to White Americans, which is a result from insufficient access to proper health care. African Americans who benefit from Medicare still face problems getting needed care than their White counterparts (Patel and Rushefsky 2008). Many African Americans depend on government insurance. If a budget cut were to take place, restricting services associated with Medicaid and Medicare, it could very likely have a disproportionate impact on the health of African Americans. Also, the quality and access of health care depend on the geographical location, discrimination, cultural and language barriers as well as income.

*Health of Hispanic/Latino Americans*

Hispanic/Latino Americans had a lower percentage rate of deaths from CVD than African Americans. Of the total causes of death, 22.5% were caused by heart disease. The percentage of deaths when considering male and female is the equivalent of African Americans, whereas more females (23.8%) died from heart disease than males (21.5%). Studies show that with diabetes, Hispanics had a higher percentage rate of deaths, with 5.1% of the Hispanic/Latino population who died from diabetes. By observing the percentage of deaths by gender I discovered that Hispanic/Latina females have a higher percentage (5.9%) death from diabetes than males (4.5%). (Statistics 2009)

Hispanic/Latino Americans Are less insured than African Americans. In 2007, 32.1% of Hispanics were uninsured (DeNavas-Walt 2008). The lack of insurance relates to the barriers of access to health care, which most often includes language and culture difficulties (Patel and Rushefsky 2008). Hispanic/Latino Americans are less likely to seek medical care. Lack of access to health care is more prevalent among Hispanic/Latina women, due to their low income status and low educational attainment. Also, Hispanic/Latino Americans are most often not given employer health insurance coverage, which in turn increases the number of Hispanic/Latino Americans that are uninsured (Patel and Rushefsky 2008).

*Urban Geography: Philadelphia, PA*

As of the year 2005, the life expectancy for Philadelphia Residences was 70.2 years for males and 78.5 years for females at birth. The leading cause of death for Philadelphia residences all ages was heart disease. Among the leading causes of death for the population also included

diabetes. In 2005, heart disease accounted for 25.9% deaths of non-Hispanic White males, in comparison to 33.6% of non-Hispanic White females. Overall, heart disease caused the death of 29.5% of the non-Hispanic White population (see, Table 3).(Lim Suet T 2005) The percentage of heart disease deaths for African Americans was 24.5%. African American males suffered 23.5% of deaths and females suffered 25.5% of deaths. Hispanic/Latino Philadelphia residents suffered 19.4% heart disease rates with 19.2% of male deaths and 19.6% female death (Lim Suet T 2006). There is a consistent trend in the health between male and female populations, with females have higher percentage rate in these diseases.

Higher rates of illness among women are very common, partially because women are poorer than men and live in lower income areas. Here, I focus on West Philadelphia, a predominately black neighborhood, and North Philadelphia, a predominately Hispanic neighborhood, to view the health among the two neighborhoods. In 2006, there were 586 deaths from heart disease in West Philadelphia. North Philadelphia had lower numbers with 544 deaths from heart disease. Diabetes deaths were significantly lower than heart disease. The number of deaths in Philadelphia for West Philadelphia was 55, while North Philadelphia had 75 deaths (Lim Suet T 2006) (see, Figure 1).

## Methods

This study is an analysis that synthesizes information from several data sources in order to illustrate connections among public health, social identity and urban geography. For this analysis, I rely on data from the U.S. Census Bureau (2005-2007), from Philadelphia Vital Statistics (2005), as well as from reports on public health, minority populations and Philadelphia. The literature review shows that minority women have a higher prevalence of heart disease and diabetes. I am only using data for adult women above 18 years of age. I also use the data that indicates a significant relationship linking income, educational level and health statistics.

I am using these particular data sources to explain that health disparities among the minorities are not only related to genetics and biological makeup, but can evolve from outside social factors as well. The literature review is providing information of socioeconomic status (SES) and its connection to health, especially the minority population. I am also using this literature review to bring to light the effects of racism on health of minorities. This approach will shed light on the unfamiliar factors for health disparities within the United States. My hope is to use this analysis to offer some suggestions for policy. One suggestion is providing better health care, health care coverage and health awareness for low income areas. Another is using urban planning as a way to incorporate easier access to health care facilities and health food stores. These suggestions can be used to improve the quality of life among all Americans, but particularly minorities and women.

## Results

Table1 indicates African American and Hispanic/Latino American populations have higher rates of mortality from diabetes and heart disease. African Americans have higher prevalence of diabetes and heart disease followed by Hispanic/Latino Americans, in comparison to White Americans. White Americans have a higher absolute number of deaths from heart

disease and diabetes for their population. Minorities have higher rates of deaths from these chronic diseases.

Table 1. Leading Causes of Death by Race and Hispanic Origin, United States, 2005

| Race and Hispanic Origin | Total Population | Cardiovascular Disease | Percentage | Diabetes | Percentage2 |
|---|---|---|---|---|---|
| All Races | 2,448,017 | 652,091 | 26.6% | 75,119 | 3.1% |
| non-Hispanic White | 2,098,097 | 564,769 | 26.5% | 59,755 | 2.8% |
| non-Hispanic Black | 292,808 | 74,159 | 25.3% | 12,970 | 4.4% |
| Hispanic | 131,161 | 29,555 | 22.5% | 6,665 | 5.1% |

The results from Table 2, indicates females have a higher mortality rate from heart disease and diabetes in comparison to their male counterparts. Hispanic/Latina and African American females have a higher mortality rate than their White female counterpart as well as their male counterparts. African American and Hispanic/Latina American women have higher prevalence of heart disease and diabetes than White American women.

Table 2. Leading Causes of Death by Race and Gender, United States, 2005

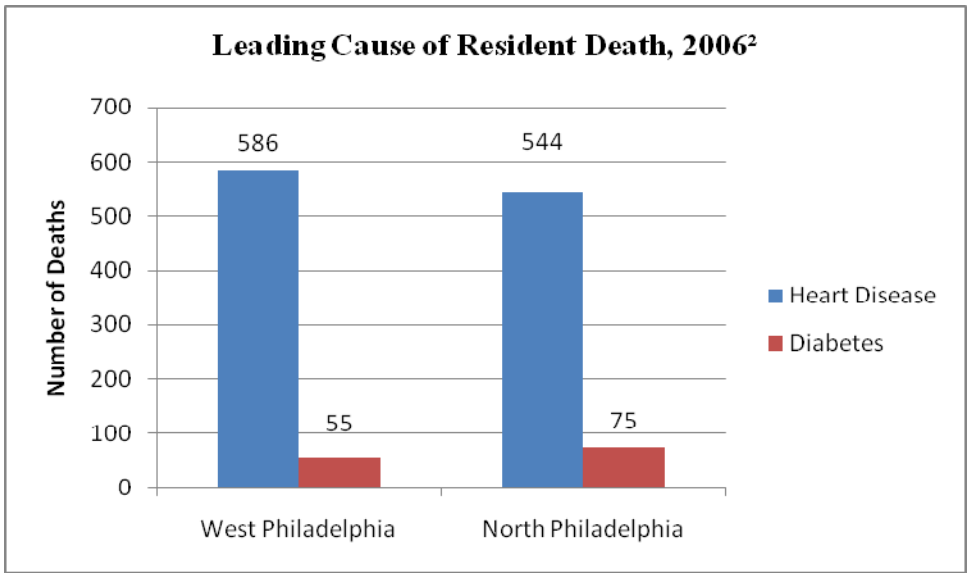
| Gender | Total Population | Cardiovascular Disease | Diabetes |
|---|---|---|---|
| Male | 1,207,675 | 26.7 | 3 |
| White Male | 1,028,152 | 27.2 | 2.9 |
| Black Male | 149,108 | 24.4 | 3.8 |
| Hispanic Male | 73,788 | 21.5 | 4.5 |
| | | | |
| Female | 1,240,342 | 26.5 | 3.1 |
| White Female | 1,069,945 | 26.7 | 2.8 |
| Black Female | 143,700 | 26.3 | 5 |
| Hispanic Female | 57,373 | 23.8 | 5.9 |

The results from Table 3, which was narrowed to Philadelphia, indicates the same outcome as Table 2, in which females still have higher mortality rate than males. The rate of heart disease and diabetes is also higher among African American and Hispanic/Latina American females in Philadelphia than their White female counterparts. Figure 1, indicates the number of deaths from heart disease and diabetes in two areas of Philadelphia.

Table 3. Cause of Death by Race and Gender in Philadelphia, 2005

| Race/Gender | Heart Disease | Diabetes |
|---|---|---|
| White | 29.5 | 1.9 |
| Blacks | 24.5 | 2.7 |
| Hispanics | 19.4 | 2.2 |
| | | |
| White Female | 33.6 | 1.9 |
| Black Female | 25.5 | 2.9 |
| Hispanic Female | 19.6 | 3.8 |
| | | |
| White Male | 25.9 | 1.8 |
| Black Male | 23.5 | 2.5 |
| Hispanic Male | 19.2 | 1.2 |

Figure 1. Number and cause of death for two areas in Philadelphia.




## Discussion

I believe the reasons behind health disparities among minorities and women are embedded in societal structures. This includes economical, political and social geographical factors that have an impact on the everyday lives of Americans. The health care industry as well as the nation's foundation was based off patriarchal dominance, or rather, the male majority and hierarchy, particularly White males. The research on health of women and minorities lags severely behind White men. Although more research has been done on minority and women's health, they still suffer more chronic illnesses and higher death rates from disease such as heart disease and diabetes than their White male counterparts.

The prevalence of heart disease and diabetes is highest among minority women, particularly African American and Hispanic/Latina women. These results can be associated with the location in which these women live along with factors relating to the situations such as, socioeconomic status (SES), poor dietary practices, residential segregation, racism, lack of access to health and health care and poor urban planning. Figure 2 shows an interrelation between the geographical location and chronic illnesses, such as heart disease and diabetes.

### *Socioeconomic Status*

Socioeconomic status (SES) is documented as being associated with poor health among minorities (Payne 1991; Barr 2008; Patel and Rushefsky 2008). SES is comprised of a person's income, educational attainment, and occupation (Auerbach, Krimgold et al. 2001). There is a relation of the three components, in which a person's income is influenced by the level of

occupation, which is obtained through the level of educational attainment. Taking this into account, majority of African Americans and Hispanic/Latino Americans have low levels of SES, because a high portion of their population lives below poverty. African American and Hispanic/Latina American women have the highest rate of poverty, especially African American women. African American women are more likely to be single mothers than Hispanic/Latina American and White American women. People with low income have poorer health status. Also, SES influences where a person lives. A person with low income will not be located in a wealthy neighborhood, which results in concentrated areas of poverty.

*Residential Segregation*

Concentrated areas of poverty are associated with residential segregation, in which minorities live in one area and Whites live in other areas. A large portion of minorities residing in urban areas are poor (Patel and Rushefsky 2008). Residential segregation can limit access to proper health care, education and job opportunities (Williams and Collins 2001). Also, there are lack of health food stores and an abundance of liquor and small grocery stores in minority areas, as opposed to White areas (Moore and Diez Roux 2006). The lack of proper nutritious food items contributes to the rise in high sodium, high fat, and affordable foods available to the minority population in these areas. The affordable healthy foods that can be available to poor population are located in supermarkets, which are located out of these areas (Moore and Diez Roux 2006). As a result, there is an increase in diabetes, obesity, hypertension, and heart disease among the population.

Philadelphia's history of housing accounted for the high concentration of poor blacks in West Philadelphia and North Philadelphia. "White flight" was a major contributor for the segregation of neighborhoods in the city, with White residences moving out to the suburbs along with jobs and businesses (Adams 1991). This event left many blacks without jobs and discrimination in real estate made it difficult to buy homes in descent areas (Williams and Collins 2001). Government housing added to segregation of the city by providing projects/apartments/community houses for African Americans who could not afford it (Wolfinger 2007).

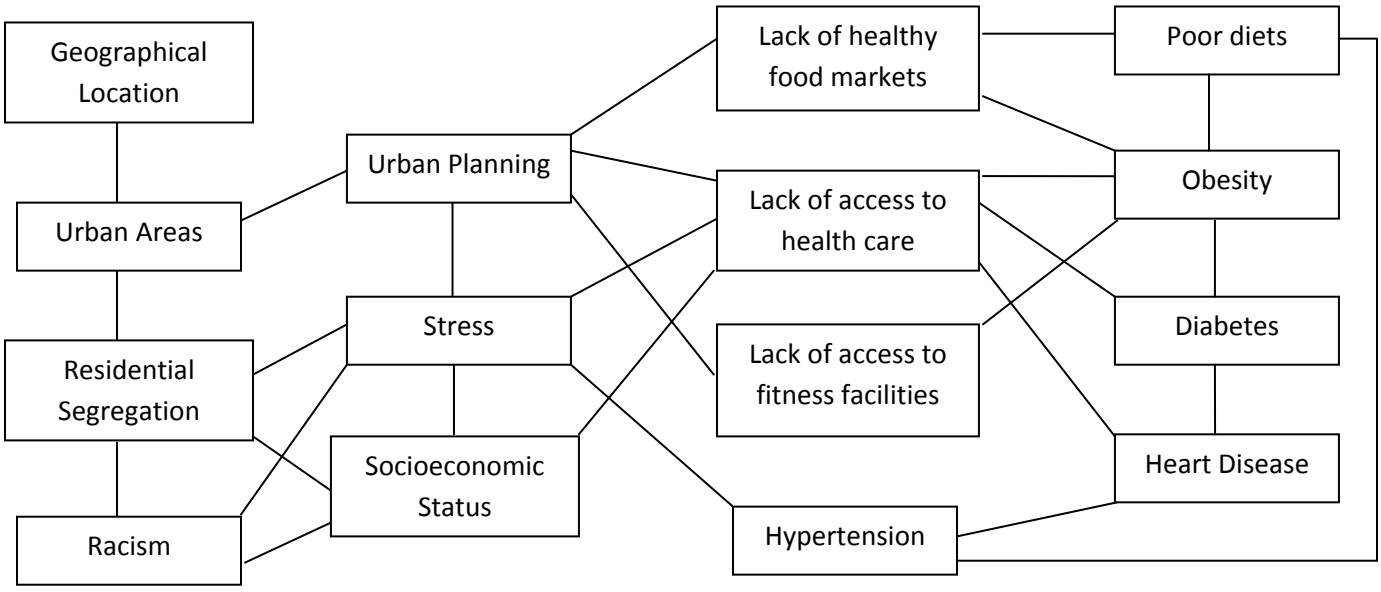
Located within poor areas of the city are poor quality health care systems. According to Patel 2008, these clinics are often understaffed and underfunded, which means they provide poor quality service. Uninsured residences are less likely to seek medical attention (Patel and Rushefsky 2008). Not having access to health care makes it harder to obtain proper health care coverage. Poor quality health care or limited access to health care can increase the likelihood of developing chronic illnesses such as diabetes and heart disease.

*Stress and Hypertension*

Stress is known to affect health status. Living in stressful environments can take a toll on a person's health, particularly women (Warren-Findlow 2006). Poverty, income, racism, segregation are stress factors (Graham-Garcia, Raines et al. 2001; Schulz, Parker et al. 2001). According to Graham-Garcia 2001, "African Americans are known to experience a more extreme degree of exposure to socioenvironmental stressors than are Caucasians". Stress is amplified more in women of these environments because they are more likely to suffer from poverty, due to being single mothers. Having low income leads to added stress because of financial burdens and not being able to provide the necessities for proper living. Language

barrier is an added stress factor, particularly for Hispanic/Latino Americans and as an implication it deters many from seeking medical attention and health care (Graham-Garcia, Raines et al. 2001). Outcomes of stress include poor dietary habits and hypertension. Poor dietary habits can lead to obesity which then can lead to diabetes and heart disease as well as other chronic illnesses. Hypertension is prevalent among African Americans. African American's have high rates of hypertension in comparison to Hispanic/Latino and White Americans (Metrosa 2006). Black women have the highest rate of hypertension, a most likely result of stress.

**Figure 2. Flow chart of the relations between minorities and poor health.**




## Conclusion

In conclusion, there are many social factors involved in health disparities plaguing minorities. There is no root cause to poor health among African Americans and Hispanic/Latino Americans, but many that coexist and lead to other new factors. By addressing the few relations to poor health care, we can find new ways of resolving or reducing these health inequalities. The minority population suffers more because they are at a disadvantage, which is due to racism, segregation, location and SES. By addressing these issues in Connection to each other, this report indicates the importance of looking at the interwoven relationships of geography and social status that affect public health. I believe that by organizing urban planning to consider public health, including the accessibility of low income and minority populations to medical care, could make a positive impact on the overall health of urban populations in this country.

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# *Physiological Regulation in Children from Maltreating Homes*

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***Abstract***

This project examined distinctions between the developmental physiology of maltreated children and non-maltreated children. Physiological regulation in childhood is a topic of increasing interest among researchers. Yet thus far there has been little exploration of physiological regulation outside the confines of ordinary childhood. This project moves beyond these confines to explore physiology regulation in maltreated children through an examination of cardiac vagal tone, an index of parasympathetic activation (Porges, 2007). Forty-six mothers and their 3-5 year old children participated in two home visits and a laboratory visit where children's cardiac vagal tone was assessed during a baseline and frustrating situation. Significant differences in RSA change scores were observed between maltreated and non-maltreated children during a moderately frustrating task indicating that maltreated children produce smaller changes in vagal tone activity during a challenging task.

## Introduction

Research has shown that child abuse and neglect undermine central emotional and social tasks that are necessary for adaptive behavior (Belsky, 1993; Gunnar & Quevedo, 2007). Accordingly, maltreatment is defined as abuse and neglect that is detrimental to the child's psychosocial adaptation and lifelong productivity (Cicchetti & Toth, 1993). Maltreatment according to Cicchetti and Toth is abuse and neglect that is detrimental to the child's psychosocial adaptation and lifelong productivity. Definitions of child abuse and neglect are dynamic and dictated by current societal beliefs. The American cultural standard plays an invasive role in making the distinction between maltreatment and nonmaltreatment. The definition used in this project requires that actions by parents cause physical or emotional damage to the child, or introduces substantial risk that the child will suffer harm (Cicchetti & Toth, 1993). Part of that harm maltreatment produces lies in parent usage of unconstructive authoritarian practices such as negative control and severe discipline which then predict greater child behavior problems (Calkins, Smith, Gill, Johnson, 1998).

Children's emotion regulation skills influence social competence and aspects such as aggression and withdrawn behavior are characterized by a lack of emotion regulation skills. Furthermore children's emotion, behavior, and physiology are interdependent (Calkins et al.,

1998). Porges' Polyvagal Theory (2003) proposes that the autonomic nervous system provides the neurophysiological substrates for emotional experiences and affective processes that are major components of social behavior. An individual's neurobiological state operates to protect and maintain homeostasis, and is dictated by the context of an environment which includes the changes that occur in that environment (Porges, 2003) Homoeostasis is controlled by the autonomic nervous system which is separated into two sections: sympathetic and parasympathetic. The focus of this project is the parasympathetic system which houses the vagus nerve that generates the vagal tone.

Porges (2003) has theorized and research has supported the notion that cardiac vagal tone as an indicator of parasympathetic activation, and thus of physiological regulation. According to Porges (2003), vagal tone is the measure of heart rate variability which is determined through assessment of high frequency variability in heart rate tied to respiratory cycles of inhalation and exhalation, called respiratory sinus arrhythmia or RSA. Through the measurement of children's RSA during resting states and in response to challenge, the extent of physiological regulation can be evaluated, in calm, resting situation a well-adapted individual will have a high RSA. When an individual is faced with a moderate external challenge, typically, an individual with good adaptive skills will apply the "vagal brake" or in other words suppress or lower their RSA. The suppression of RSA is reported to allow the individual to shift focus from internal homeostatic demands to external demands that require coping strategies to control affective or behavioral arousal (Calkins et al., 1998). Thus, vagal suppression is thought to enable a child to adaptively engage or disengage from the environment. Research has documented that baseline RSA and RSA changes in response to challenge are associated with positive developmental outcomes in children (Calkins et al., 1998; Calkins & Keane, 2004).

Despite the fact that researchers have examined relations between children's physiological regulation in middle-class and otherwise low-risk environments, little is known about the effects of socioeconomic status or high-risk parenting such as maltreatment on children's capacities for physiological regulation. The examination of physiological regulation in maltreated children is innovative. Researchers have looked at physiological regulation in individuals who have experienced a normal childhood but have not yet explored the potential differences that may be seen in atypical childhoods. Through the focus on maltreated children this author hopes to bring greater insight into possible biophysiological distinctions between the two groups that extend beyond their differences in the way they were treated in childhood. Specifically, two aspects of children's vagal tone will be examined: baseline vagal tone and change in vagal tone during a challenging task. Baseline vagal tone is the body's physiological regulation during a resting state and is high when an individual is in this state. This project will examine individuals when they are resting and calm without any external challenge. Then an external challenge will be applied to examine variation in the extent to which children let up off the 'vagal brake" (Calkins et al., 1998) to attend and focus during the moderately frustrating task. In sum, this study was designed to investigate whether differences exist in children's capacities for physiological regulation depending on whether they come from maltreating vs. non-maltreating families. It is expected that children living in a maltreating family context will show greater difficulty with physiological regulation.

Hypotheses

Research has shown that maltreatment has extensive long-term, negative effects on children (e.g., Cicchetti & Toth, 1993). The first difference that I expect to see between the two groups is that maltreated children will show lower RSA baseline scores than non-maltreating

children, who in contrast will show higher baseline RSA scores. I made this presumption based on the fact that maltreating children have a higher exposure to violent behavior in which case they are less likely to display a resting state because their environment may constantly demand them to remain alert. So unlike their nonmaltreated counterparts, they do not experience a successive amount of physiological rest. Thus it is my belief that even when maltreated child is suppose to be in a rest state, physiologically they remain in an alert state.

Second, I predict that nonmaltreated children will demonstrate greater RSA change scores (i.e., reduction in RSA scores from baseline to engagement in a challenging task).

## Methods

Participants

N = 46 mother-child dyads from five counties in rural, central Pennsylvania were recruited for this project. N = 20 families are nonmaltreated and the remaining 26 dyads are involved with Child and Youth Services Bureaus (CYS), for preventive or protective services. Twenty-six of the children were female and 22 were male with an average age of 3.64 years old. Ethnically the overwhelming majority of the children were white with 38, then 9 multiracial and 1 African-American. Mom's average age was around thirty years old and ethnically the majority matched that of the children's ethnic majority. N = 44 mothers where white, 1 was African-American, 1 was Hispanic/Latino, and 2 were multi-racial. The income of the dyads ranged from $10, 000 up to $50, 000 or greater. The majority of the families reported income levels between $10, 000 and $30, 000. In addition 29 mothers received their high school diploma, 13 received their Associates degree, 5 got their Masters and 1 went on to receive a degree post-Masters. As far as an occupation goes, 54.2% were unemployed, 14.6% were blue collar, 10.4% were clerical, and 20.8% were professional.

Instruments

Cardiac Vagal Tone. RSA will be used to index level of cardiac vagal tone, both at resting baseline, and during a moderately frustrating task. Electrodes are placed on the child on the distal end of the right clavicle, lower left rib cage chest, and the lower abdomen (Family Study Manual), and the signal is wirelessly monitored. Autonomic reactivity is recorded online using a MP100SW Cardiographs connected to an individual PDA computer equipped with data acquisition hardware and software (Mindware Technologies, Westerville, OH). Heart period is derived from the ECG waveform for analysis of cardiac vagal tone (RSA). To quantify heart rate data, ECG pulses are passed through an A/D converter programmed to trigger at each R spike of the ECG data.

The heart rate period data will be analyzed using Mindware software which outputs heart rate, heart period, and RSA values. The RSA values are derived from the interbeat interval series which is resampled at 25 msec to create a stationary wave form. The integral of the power in the RSA band (.24 to 1.04 for children) is extracted and the natural logarithm of this measure produces the RSA statistic. Periods of data that show movement artifact are edited manually. RSA baseline scores are averaged across 30" intervals during the 5' baseline assessment. The RSA data are edited in 30 second segments and averaged across segments (Family Study Manual). Baseline RSA is obtained on the child while s/he watches a neutral children's video for 5 minutes (Family Study Manual, 2008). RSA change scores are calculated by subtracting a child's mean RSA obtained during the Lockbox task from their baseline RSA value.

The Lockbox task was used as a moderately frustrating challenge during which vagal tone was assessed. The purpose of this task is to provoke frustration in these preschool children so to assess their emotion and emotion regulation capacities (Goldsmith, Lemery, Longley, Prescott, 1999). The child is presented with a clear plastic container inside which contains their favorite toy. This transparent box has a lock on it that can only be opened using a key. The interviewer demonstrates to the child how to open the open the lock with the key so that the toy can be retrieved. Before leaving the room the interviewer intentionally gives the child a set of incorrect keys and instructs the child to use the keys to open the box. While alone the child proceeds to attempt to open the box but typically frustration is induced after repeated failed attempts to get the lock open to retrieve the toy. This is where the more alert RSA levels are established and then used to detect the RSA change from RSA baseline to frustration task. After the 4 minutes the interviewer returns with the correct set of keys, apologizing to the child for giving them the incorrect set of keys. Following the task, children are given time to play with the toys.

Procedure

Dyads were invited to participate in an NIMH funded project called the FaMILY Study. The FaMILY study is an on-going project exploring how child maltreatment and the stresses families experience influence mother-child relationships, maternal emotion regulation, and children's self and emotion regulation development. In order to participate the children must meet the criteria of falling between the ages of three to five years old. Maltreating families must have been involved with CYS preventative or protective services during the previous three-year period. Mothers must still be the primary caregiver, at least 18 years old, and able to fluently speak English. There were three visits two of which are in the home of the family and one of which is held in the lab. The main focus of this project is the lab visit where the examination of physiological regulation takes place.

Following the closer examination into the status of the mother and child from either maltreating or nonmaltreating families during two home visits there is a final third visit at the lab. During this lab visit children's baseline vagal tone and vagal suppression was collected during a frustrating situation. Mother and child are observed behind a one way mirror in a room that is designed to appear to be a comfortable living room space.

Mother-child dyads excluded from this project included mothers were not the primary caregiver of their 3-5 year old. Also prohibited were mothers who were not cognitively competent which was determined from the Mini-Mental Status Exam given during the first home visit. Families that have any description of mother being the perpetrator of sexual abuse or the child experiencing sexual abuse are ruled out from this project. Additionally mothers or children diagnosed with a serious physical impairment were not included in this study.

## Results

This study took a closer look at children's physiological regulation by way of cardiac vagal tone which is measured by Respiratory Sinus Arrhythmia (RSA). A comparison was then made between children from maltreating families vs. non-maltreating families in terms of their RSA levels during a baseline task and change in RSA from baseline to that during a frustrating task to test my hypotheses. My first hypothesis was that nonmaltreated children would have a higher RSA levels during baseline. My second hypothesis was that nonmaltreated children would post

higher RSA change scores from baseline to frustrating task, and thus would be better equipped physiologically regulate in response to challenge. Typically while making these group comparisons, a p-value = .05 is used to determine statistical significance. In this case statistical significance was assessed using a more liberal p-value = .10, because this project represents pioneering work and employs a small sample size.

A t-test was conducted comparing RSA baseline scores in nonmaltreating vs. maltreating children and the results were not statistically significant: t (44) = .17, p = .86. Thus there is no support to suggest a difference between the physiological regulations in children from maltreating versus nonmaltreated families. In other words, the results showed that nonmaltreating children and maltreating children have approximately the same level of vagal tone activity during RSA baseline.

Next a t-test was conducted on RSA change scores of children from nonmaltreating vs. maltreating families. Results of this t-test were significant: t (40) = 1.77, p = .08. So there was in fact a difference between the RSA change levels in nonmaltreated children versus maltreated children. My hypothesis was supported by the results proving that nonmaltreated children have a greater vagal suppression when experiencing a frustrating situation. Table 2

Below are two tables that show the results of the two t-tests and means and standard deviations for RSA baseline and change scores of children from maltreating vs. nonmaltreating families. Results indicate that children from nonmaltreating families show significantly higher RSA change scores than did children from maltreating families.

Table 1

*Group Differences in Children's $RSA_{Baseline}$ and $RSA_{Change}$ Scores by Family Maltreatment Status*

| Vagal tone | CM_Group | N | Mean | Std. Deviation |
|---|---|---|---|---|
| $RSA_{Baseline}$ | non-CM | 20 | 6.24 | 1.03 |
| | CM | 26 | 6.17 | 1.43 |
| $RSA_{Change}$ | non-CM | 18 | 1.03* | .73 |
| | CM | 24 | .61* | .79 |

*p-value < .10 Higher $RSA_{Baseline}$ scores indicate greater resting vagal tone. Higher $RSA_{Change}$ scores reflect greater vagal suppression.

## Discussion

This study was focused on discovering whether or not there was a difference in the physiological regulation of children from maltreating versus nonmaltreating families. Existing research has generally focused on lower-risk children and their ability to regulate themselves physiologically. So I wanted to explore whether or not high-risk maltreated children have more difficulties in physiologically regulating themselves. In order to check for each group's ability to regulate themselves when frustration is elicited I needed to make the comparision between their vagal tone at rest and then during a stressful situation. My first hypothesis was that at baseline vagal tone would be lower among children from maltreating families. Results suggest that group membership did not predict differences in children's baseline RSA.

However beyond baseline vagal tone, I also examined whether vagal change scores differed by maltreatment group, in order to learn whether children from maltreating families showed more maladaptive physiology in response to a frustrating situation. The data supported my second hypothesis in that children from maltreating families showed lower RSA change scores than did children from non-maltreating families. Since children from maltreating families showed lower vagal change in response to frustration that suggests they are less flexible in managing environmental challenges. Although these findings are exploratory and based on a small sample of at-risk children and thus should be carefully viewed, one plausible explanation for these findings is that children's difficulty with this critical skill signifies a maladaptive approach to dealing with new situations where there are external environmental demands.

Statistical power is important and influences whether significant findings are observed when they in fact exist in the population. The larger the sample size, the more statistical power an analysis has. Since my sample size was only N = 46 mothers, it is possible that the non-significant differences in baseline vagal tone scores of children from maltreating vs. nonmaltreating families would emerge as significant if a larger sample size had been employed. In other words, a larger sample would have provided more statistical power and perhaps support for my first hypothesis would have been observed. Beyond the fact that the sample size was already small, an even smaller amount of data was able to be analyzed. During each lab visit mother and child are fitted with electrodes but uncontrollable variables such as electrodes falling off or a bent wire disabling the heart rate variability reading of the data. Any disruption in the collection process further limits the sample size and curtails the statistical power of the conclusions to be made. Another implication that needs to be taken into consideration is the fact that this data was obtained using participants that had many demographic similarities. Besides the fact that the participants were all from rural central Pennsylvania they were for the most part generally white, of low socioeconomic status, minimal high school education, and unemployed. Thus it would be inappropriate for my findings to be used to generalize my results to any other population that do not match those listed traits.

Previous research exposed the fact that maltreatment can have a negative long-term affect on individuals (Cicchetti, 1993) and the results of my study exposed just how early some of those affects may begin. Maltreated children are regressing in the classroom and /or showing aggressive behavior, which are both early signs for an unsuccessful academic career (Calkins et al., 1998). The effect of an inability to physiologically regulate oneself illustrates itself not only in the classroom, but also in a lab when the feeling of frustration is elicited. In order to adaptively respond to an external challenge an individual needs to be able to the brakes on their RSA and engage the challenge. The context of a child's environment can either enhance or

dissolve this skill. While my findings are exploratory and should be carefully viewed, a plausible conclusion is that difficulty with this critical regulatory skill signifies a maladaptive approach to dealing with new situations where there are external environmental demands.

Future research could examine whether security of attachment plays an important role in children's physiological regulation abilities, above and beyond the effects of maltreatment severity or type (i.e., abuse vs. neglect). Attachment is developed very early on and although this project targeted young preschool-aged children, future research work is needed with even younger children in order to learn how early attachment may influence children's developing physiological regulation.

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# *Sexploitation of Children: Exploratory analysis of data availability and reliability*

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## Abstract

***Problem***: Child sexploitation data are difficult to find and often of questionable validity. To understand the scope of the problem and examine criminal patterns, data needs to be charted across time on a large scale and analyzed in context with structural explanatory factors. ***Methods***: To determine what data are available, six countries were examined, and a data set developed. The data were quantitatively compared to national structural factors (ex: infant mortality rates). ***Results***: There was very little accurate data. Very rough estimates were obtained, but cannot be construed as scientifically reliable. ***Conclusions***: Accurate research with replicable methodology will lead to a better understanding of the problem so that patterns and predictors can emerge from valid and reliable data.

## Introduction

Children have been sexually exploited throughout history in various ways and forms, and only recently has this been recognized as an important social problem (Porter, 1997; Rush, 1980; Gorham, 1978; Finkelhor, 1994; Walker, 2002). Many studies of child sexploitation – a term used here to encompass all major forms of child sexual exploitation and abuse: 1) child pornography, both online and otherwise, 2) online sexual solicitation, 3) child trafficking for sexually exploitative purposes, 4) child sexual abuse, 5) child prostitution, and 6) child sex tourism – address psychological issues resulting from sexploitative practices, such as post-traumatic stress disorder and criminal tendency in later life (Hertzig, Farber, Kendall-Tackett, Williams, and Finkelhor, 1994; Adam, Everett, and O'Neill, 1992; Hertzig, Farber, Saywitz, Mannarino, Berliner, and Cohen, 2003; Finkelman, 1995, p. 157-158; Kelly, Wingfield, Burton, and Regan, 1995). Other studies examine sexploitation rates through retrospective studies with adults (Hertzig et al., 1994; Finkelhor, 1994; Watts and Zimmerman, 2002). Numerous studies look at why adults sexually exploit and abuse children (Crosson-Tower, 2005, p. 183-186; Marshall, 1988, p. 268; Finkelhor, 1995; Ybarra, Mitchell, Finkelhor and Wolak, 2007), while others look at strategies to prevent sexual exploitation (*Blueprints of Experience*, 2007; *Annual Report*, 2007, p. 15; Kelly et al., 1995; Ybarra et al., 2007). Few studies, however, have attempted to examine all aspects of child sexploitation together, nor systematically examine the incidence of child sexploitation over time and multiple nations (*Trends*, 2008; Finkelhor and Ormrod, 2004).

The United Nations Office on Drugs and Crime (UNODC) released the Trafficking in Persons: Global Patterns report in April 2006, in which they discussed the difficulties in tracking the problem of human trafficking statistically:

> UNODC does not estimate or approximate the number of victims trafficked. Given that it is inherent to the nature of any organized criminal activity that the greater part of the activity goes undetected, that statistical goal may prove to be ultimately unachievable.
>
> Measuring the amount of trafficking in persons should not be seen as necessary, however, to justify an action in response. (Kangaspunta, 2006, p. 45)

In some ways, this may indeed be accurate – complete and accurate numbers may indeed be ultimately unachievable, and it is true that the numbers are not necessary to justify a response. Estimations must still be obtained if there is to be any confirmation of the effectiveness of the responses enacted or of the accuracy of the factors currently used to predict child sexploitation patterns. Confirmation of effectiveness, in turn, is critical to developing more effective policies and accomplishing the wider goal of ending child sexploitation.

Although the UNODC report commented that

> the quest for numbers alone will not lead to a greater understanding…and, therefore, the development of a more effective international response. (Kangaspunta, 2006, p. 45)

A data set of numerical sexploitation estimates charting the problem over time and then comparing the existing patterns to demographic characteristics such as national fertility rates may indeed lead to greater understanding and a more effective response. Charting

the problem through time is vital to see if any shifts in patterns occur. Locating these patterns will allow for further research into why the patterns exist, and may be key to unlocking further solutions and prevention strategies, as well as better understanding of what is occurring where, why, when, and to whom.

Child sexual abuse has only recently been perceived as a problem, and even less recently been systematically examined to any degree. However, this study is a vital first step toward a wide-view analysis of a problem that exists in all corners of the world (*Report of the independent expert for the United Nations study on violence against children*, 2006, page 5). Therefore, this exploratory research will examine which countries provide reports for various categories of child sexploitation and if the available data are sufficient to track trends over time. The second step then will entail analyzing the reliability of current data, and research gaps that need to be addressed when formulating such a data set.

## Literature Review

Although the term "child sexual exploitation" has been utilized by past researchers to address multiple categories of child sexual abuse, I created a new term for this research. Generally, "child sexual exploitation" has been used to describe child sexual abuse involving exploitative monetary transactions such as those seen in the distribution of child pornography, the purchasing of child prostitutes, and the trafficking in children for sexual purposes (Schieffer, 2008; Estes and Weiner, 2001). I selected the term "sexploitation" to emphasize the inherently exploitative nature of all child sexual abuse, rather than those that produce solely a physical monetary result. Though not always obvious, perpetrators of child sexual abuse always get something out of the encounter – it is why they abuse. Some profits from sexploitation include feelings of power or sexual stimulation for sadists, providing an emotional "relationship" for pedophiles, or satisfying the monetary greed of those who make a profit from child sexploitation but may not personally utilize a child for sex (Crosson-Tower, 2005).

Child sexploitation is difficult to accurately measure at the national level, much less at the international level because of varying definitions used throughout studies and subsequent measurement issues, among other factors (Hopper, 1996-2008, http://www.jimhopper.com/abstats/#unrpt, "Introduction"). Despite these difficulties, statistical averages have been suggested. The Report of the Independent Expert for the United Nations Study on Violence Against Children (Pinheiro, 2006) found an average of 223 million incidences of sexual violence against children each year, with nearly two-thirds of victims being female (150 million) and one-third male (73 million) (p. 10). The United States Child Protection Services (CPS) – which gathers data from smaller child protection agencies across the country – tries to maintain an accurate record of child abuse statistics, but Hopper (1996-2008) suggests that government organizations like CPS are not reliable, especially when measuring child sexual abuse. There are several reasons for government inaccuracy, ranging from victim underreporting, to many government agencies reporting only "substantiated"/"confirmed" cases (Hopper, 1996-2008, "Statistics are Human Creations"). Although the USA has been attempting to measure the problem of child sexual abuse, the wide ranges of incidence estimates over

the last several decades indicates that government researchers have encountered difficulties in assessing the real population data.

For example, 1988 National Institute of Mental Health research suggested that American pedophiles, on average, abuse 117 children. Data from 1995 however, suggest that only 30% of child molesters in therapy (n = 91) had 10 victims or more (Elliott, M., Browne, K., and Kilcoyne, J., 1995, p. 581), though "Statistics Surrounding Child Sexual Abuse" claimed the average molester will have preyed on as many as 400 child victims by the end of his lifetime (2001-2008, http://www.darkness2light.org/KnowAbout/statistics_2.asp, last paragraph). In 1987, it was estimated that there were 39 million survivors of childhood sexual abuse in the USA ("Statistics Surrounding Child Sexual Abuse", 2001-2008, paragraph 10), but by 1993, the number had almost doubled to 60 million estimated ("Sexual Abuse Statistics", 1996-2006, http://www.prevent-abuse-now.com/stats.htm, "Impact of Child Sexual Abuse"). Finally, between 1986 and 1993 the National Incidence Study (NIS-3) increased their estimate of the number of sexually abused children in America by 83% ("Child Abuse Statistics", n.d., http://www.yesican.org/stats.html, paragraph 13). Hopper (1996-2008) suggests that the reported "increases" in the number of sexually abused children are extremely misleading, because government incidence reports of increased rates of child sexual abuse may not actually be a measure that rates are on the rise. It is entirely possible that higher estimates are a result of stricter laws, better enforcement, or increased case reporting due to a more informed public (Hopper, 1996-2008, "Statistics are Human Creations").

Although not all research is reliable, "Statistics Surrounding Child Sexual Abuse" (2001-2008, paragraphs 6, 7, & 9) estimates that 70% of all sexual assaults are committed against children, and that one in every four underage girls and one in every six underage boys have been subjected to some form of sexual abuse. In addition, research by "Child Abuse Statistics" notes that the 1993 study by the American Psychological Association Commission on Violence and Youth found that children under age 18 are victimized far more than adults in every category except homicide (http://www.yesican.org/stats.html, paragraph 28).

Children also risk sexual victimization on the Internet. From 1998 to 2009, CyberTipline, a USA-based reporting agency, received 581,236 reports of child pornography, and 43,156 reports of online child sex solicitations (*CyberTipline Factsheet*, 1998-2009). CyberTipline's annual reports indicated a significant increase in reporting over the last decade – in 1998 they received a total of 4,560 reports, but the year 2008 resulted in over 100,000 child abuse reports (*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009). A full 89% of all reports to CyberTipline involved the possession, manufacture, and/or distribution of child pornography. CyberTipline's results suggested to the National Center for Missing & Exploited Children that one in seven children online would be sexually solicited (*Annual Report*, 2007, p. 6 & 7). "Statistics Surrounding Child Sexual Abuse" (1991-2008, paragraph 8) noted that one in five children online are sexually solicited, but perhaps the most detailed data set came from a study done by Wolak, Mitchell, and Finkelhor (2006), which estimated that roughly three million children were sexually solicited online in 2005 (Wolak et. al., 2006, p. 73).

An altogether different measure of online child sexual abuse can be seen in the work of the Internet Watch Foundation, which like CyberTipline is based on voluntary reports by Internet users of criminal child abuse violations. The Internet Watch Foundation (IWF), based in the United Kingdom, has as its main objective the tracking and reporting of "top-level" child pornography domains to their local police as well as international criminal justice organizations. The IWF does not measure individual child pornography images, but instead focuses on larger, more organized criminal child sexual abuse image distributors (*Trends 2007*, 2008, http://www.iwf.org.uk/media/page.195.524.htm). Like CyberTipline, the IWF has seen an increase in reported violations (a 10% increase from 2006 to 2007, though reporting decreased by 3% from 2007 to 2008), but has not seen any subsequent rise in top-level domains. Out of nearly 35,000 abuse reports in 2007, the IWF confirmed 2,755 as top-level child sexual abuse domains (domains with multiple indecent pictures of children, rather than sites with singular pictures). In 2008, there were 33,947 abuse reports, with 1,536 "unique domains relating to child abuse content" confirmed. The IWF has actually seen a shift in the trend – there has been a 21% decrease from 2006 to 2008 in domains confirmed to exhibit child pornography, and a 15% decrease from 2006 to 2007 in individual websites. There seems to be no change in the number of non-commercial exchanges of child sexual abuse images via message boards, etc, but the vast majority of those areas the IWF keeps track of (estimated at 80%) are commercial organizations (*Trends 2007*, 2008, paragraphs 3-5; *Trends 2008*, 2009, http://www.iwf.org.uk/media/page.70.554.htm, paragraphs 2 & 3).

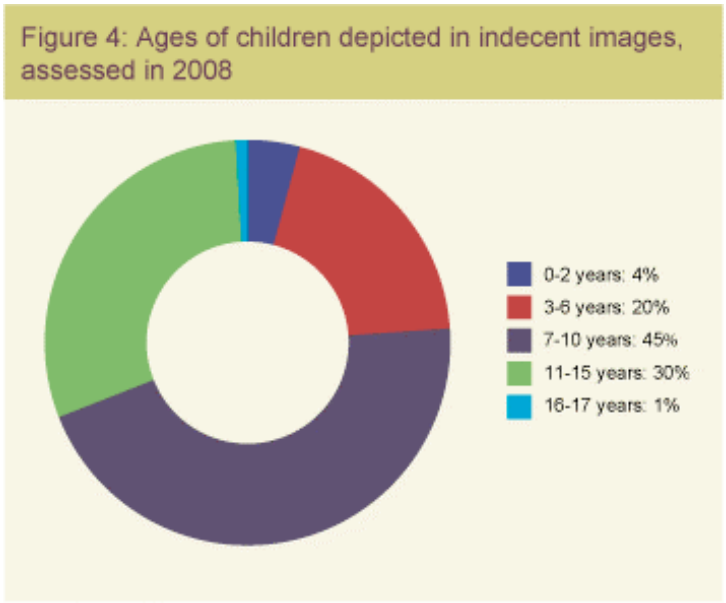
Most interestingly, the IWF says that the "problem appears not to be on the increase despite ever-increasing global internet access, speed of connection and the widespread availability of sophisticated technologies," which is in direct contrast to the results anticipated (*Trends 2007*, 2008, paragraph 5).

The IWF examines the age and recognizable features of the children in the sexual abuse images to assist the police in locating victims. There was a notable shift in ages of child victims: in 2007, 10% of images featuring infants under the age of two (Figure 4: http://www.iwf.org.uk/media/page.195.524.htm and Figure 4: http://www.iwf.org.uk/media/page.70.554.htm were taken from the IWF report), while in 2008 this number had dropped to 4%. Victims three to six years of age decreased, and the percentage of victims ages eleven to fifteen almost doubled (*Trends 2007*, 2008, paragraph 12; *Trends 2008*, 2009, paragraph 9).

**Figure 1:**


(*Trends 2007*, 2008)

**Figure 2:**




(*Trends 2008*, 2009)

In examining child sexual abuse images, the IWF assigns each image a number according to sentencing guidelines:

**Table 1: Ranking of severity of child pornography**

| Level | Description |
|---|---|
| **1** | Images depicting erotic posing with no sexual activity |
| **2** | Non-penetrative sexual activity between children or solo masturbation by a child |
| **3** | Non-penetrative sexual activity between adults and children |
| **4** | Penetrative sexual activity involving a child or children, or both children and adults |
| **5** | Sadism or penetration of or by an animal |

(*Trends 2007*, 2008)

Recently, there has been a visible increase in higher levels (4 and 5) of abuse in the images assessed by the IWF. In fact, in 2007, 47% of the images examined by the IWF were categorized at the highest levels of abuse, and the statistic increased to 58% in 2008 (*Trends 2007*, 2008, paragraph 14; *Trends 2008*, 2009, paragraph 10).

Another complex category of child sexploitation is child prostitution. Children are prostituted in various ways – sold by their own families to be trafficked to brothels, sold as mail-order brides or concubines, pimped out by relatives, kidnapped and trafficked, lured into prostitution either knowingly or through falsehood, and more. Child prostitutes are purchased locally, trafficked outside their borders to be sold in a foreign country, or purchased by sex tourists – people who travel from their native country to another in order to have sex with children (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005; Kelly et. al., 1995; Willis and Levy, 2002).

The Report of the Independent Expert estimates that in 2000, 1.8 million children were forced into prostitution and pornography (Pinheiro, 2006, p. 10). End Child Prostitution, Child Pornography and the Trafficking of Children for Sexual Purposes USA (ECPAT-USA) has a smaller estimate – that two million children are exploited in total throughout the world (*Fact Sheet about Child Sex Tourism*, n.d., p. 1). Though the year the fact sheet was produced is unknown, it is possible it was made earlier, when estimates were even more difficult to assess than they are today. UNICEF's 1995 Progress of Nations report estimated the number of children involved in the sex industry to be at about one million (Kelly et al., 1995, p. 39). One of the largest estimates came from Willis and Levy's 2002 global health study, which estimated that about one million children were forced into prostitution every year, with the total number of children involved in the prostitution industry possibly being as high as ten million. This study provided a 20-country/city estimate of the number of child prostitutes.

**Table 2: Number of children exploited through prostitution for select locations**

| Country (city) | Estimated numbers of children exploited through prostitution |
|---|---|
| **Bangladesh (Dacca)** | 10,000 |
| **Brazil** | 100 000–500 000 |
| **Cambodia** | 5950 |
| **China** | 200 000 |
| **Colombia (Bogotá)** | 5000–7000 |
| **Dominican Republic** | 25 500 |
| **India** | 400 000–575 000 |
| **Indonesia** | 42 000 |
| **Nepal** | 28 000–40 000 |
| **Netherlands** | 1000 |
| **Pakistan** | 20 000–40 000 |
| **Paraguay** | 26 000 |
| **Philippines** | 40 000–100 000 |
| **Russia** | 20 000–30 000 |
| **Taiwan** | 40 000–60 000 |
| **Thailand** | 200 000 |

| | |
|---|---|
| **USA** | 300 000 |
| **Venezuela** | 40 000 |
| **Vietnam** | 8000–20 000 |
| **Zambia** | 70,000 |
| Source: ECPAT-USA, 1999. | |

(Willis, 2002, p. 1417)

Child prostitutes, like all other sex workers, face higher risks of violence and disease than their non-victimized counterparts. The U.S. Department of State's 2005 *Trafficking in Persons Report* suggested that the majority of prostitutes have been raped (60%-75%), and even more have experienced physical assaults (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 19). Willis and Levy's 2002 study corroborated this estimate; reporting that 62% of their study participants had been raped and 73% had experienced physical assault (p. 1419). The risk of disease is also high. Willis and Levy's 2002 study noted reports indicating that child sex workers in southeast Asia were infected with HIV 50-90% of the time, and that "in some communities, up to 86% of sex workers are infected with HIV" (p. 1418).

The U.S. Department of State's *Trafficking in Persons Report* 2005 said that 50% of all trafficking victims (total trafficking victims is estimated at 600,000 to 800,000) are children (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 6). This number may be drastically underestimated – the report by the Independent Expert suggests that in 2000, 1.2 million children were victims of trafficking (Pinheiro, 2006, p. 10). *Trafficking in Persons Report* (2005) noted Burma, North Korea, Russia, and Vietnam as some of the "source" countries from young girls are trafficked.

However trafficking is measured, there is little doubt that it is widespread. Even considering the least yearly estimate of total child trafficking rates – 300,000 to 400,000, according to the U.S. government (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 6) – only a small percentage of traffickers are caught each year, as seen by the 2005 Trafficking in Persons global-scale report of prosecutions and convictions for trafficking offenses shown in Table 3.

**Table 3: Worldwide prosecutions and convictions of those arrested for human trafficking**

| YEAR | PROSECUTIONS | CONVICTIONS | NEW OR AMENDED LEGISLATION |
|---|---|---|---|
| 2003 | 7,992 | 2,815 | 24 |
| 2004 | 6,885 | 3,025 | 39 |

(*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 34)

Child sex tourism, although not the main staple of the child sex industry, is booming due to the adult sex tourism industry. Legalized prostitution and active adult sex industries create openings exploited by commercial sex slavery (*Victims of*

*Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 20). ECPAT-USA agreed, saying that active sex tourism industries lead to increased child sexual abuse rates. ECPAT-USA also suggested that the increased demand for younger children may be due to the belief that a younger child is less likely to have been infected with HIV/AIDS, a theory widely supported among researchers. (*Fact Sheet About Child Sex Tourism*, n.d., p. 1; Kara, 2009; Bishop and Robinson, 1998, p. 8)

At particular risk of being prostituted are orphans (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 17; Kelly et. al., 1995, p. 39), children from poor rural families (Kelly et. al., 1995, p. 45 & 46; Kara, 2009, p. 62-64, 66, & 168-172), and "street children" (Kelly et. al., 1995, p. 44), because these groups either have no guardians (and thus no one to search for them) or have families whose financial burden is so great that the removal of a child or the payment for that child's labor (even prostitution) is a welcome relief (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005; Kelly et. al., 1995; Willis and Levy, 2002; Kara, 2009, p. 8, 62, 66, & 168-172). Higher child prostitution rates are likely to be seen in areas with severe gender gaps (areas where males are considered more valuable or important than females and have a social structure reflecting this belief), in which girls are seen as a burden or are otherwise unwanted (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005; Kara, 2009, p. 8, 31, 76,125 & 172-173).

Child prostitution rates may also increase as a result of natural disasters (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 17), the presence of some form of military and/or war or domestic conflict (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 11; Kelly et. al., 1995, p. 39 & 44; Kara, 2009, p. 23 & 169-172), and the presence of organized crime (*Victims of Trafficking and Violence Protection Act of 2000: Trafficking in Persons Report*, 2005, p. 13-14). Child prostitution rings move from location to location in accordance with perceived rises and declines in HIV/AIDS risk (because clients aim for lower-risk areas) and law enforcement crackdowns (Kelly et. al., 1995, p. 45).

The previous literature review demonstrates that some information concerning child sexploitation appears in readily available data. There has been a great deal of research done as to why children are trafficked, which children are trafficked, and how traffickers use and abuse them. There is an equal profusion of research on the impacts of child sexual abuse in all forms. These have had important policy implications, however there is an extreme lack of agreement on the actual numbers of child victims. This gap is due in part to the fact that victims rarely report their abuse ("Statistics Surrounding Child Sexual Abuse", 2001-2008), and because gathering the data can be hazardous to the researcher's health (Mutch, 2007).

## Methods Section

Finding numerical data for child sexploitation rates and mapping these rates over time requires a qualitative content analysis, an unobtrusive method to locate and assemble publicly available data, with the goal being the creation of a new data set to

measure and chart child sexploitation rates. This particular qualitative content analysis involves locating prior studies, reports, and other research through five main resources:

1) Prominent research groups, such as the United Nations Children's Fund (UNICEF), National Center for Missing and Exploited Children (NCMEC), International Labor Organization (ILO), United Nations (UN), Centers for Disease Control and Prevention (CDC), and the International Labor Organization (ILO), among others. A good portion of data came from searching the publications and research provided by these groups, and by contacting representatives by e-mail for past studies and other research recommendations.
2) Similarly, publications and research by NGOs and private research organizations, such as the Crimes Against Children Research Center (CACRC) yielded detailed data, and several representatives responded to e-mails by providing links to further studies or new, innovative organizations.
3) The Google Scholar Search Engine was particularly useful. Articles were located by utilizing search terms according to three categories:
   a. Topic – ex., "history child prostitution" and "child sexual abuse"
   b. Authors previously referenced by relevant articles already researched – ex., a study cited an author who wrote an article on online child solicitation. By searching the author's name, dozens of other studies and multiple books and news articles were located, many of which had pertinent statistics.
   c. Titles previously referenced – ex., a study cited the Trafficking in Persons Report, which led to the discovery of the U.S. Department of State's collection of Trafficking in Persons Reports.
4) The Pennsylvania State University Library CAT system was particularly useful in locating compilations of articles in book form according to such search terms as "child pornography" and "child prostitution"
5) Scholarly journal online databases, such as SpringerLink, InformaWorld, and JSTOR yielded results best when searched by topic (ex., "child sexual exploitation")

These articles are used to establish: 1) concrete definitions of child sexploitation's six categories (child sexual abuse, child pornography, child online solicitation, child sex trafficking, child sex tourism, and child prostitution in general), 2) incidence records, or concrete numbers, of children exploited, and 3) explanations for any missing statistics. The concrete numbers are then charted and graphed and information gaps noted and explained. In addition, potential problems with the data are discussed, as some data can be misleading. For example, the United States Trafficking in Persons Reports (2001-2008) had broad changes in human trafficking estimates since the program was instated, and provide little information on how these estimates were obtained. Several studies speculate that reports providing similar estimates were merely making "guesstimates," and cannot be taken as factual numerical observations (*How Many Juveniles are Involved in Prostitution in the U.S.?*, n.d.).

The combined data set appears in the Findings section with background information as to how statistics were obtained or determined to be absent for each country. For child sexploitation categories that lack concrete numbers, a content analysis of past studies was conducted to discuss current and past estimated severity of child sexploitation for each country. The Discussion Section of this paper then details any

potential problems which may have skewed the data results – for example, United States child sexual abuse is measured here according to confirmed child sexual abuse cases, which do not always include stranger rape, molestation by someone other than a family member, and do not signify the actual number of sexually abused children for any given year (Finkelhor, Hammer, and Sedlak, 2008).

The countries themselves were initially selected according to three factors. In order of selection these were: 1) United States Trafficking in Persons Report rankings – two countries per tier, 2) Under-5 Mortality Rates (as reported by UNICEF) – selecting those countries with the highest and lowest rank from each tier, and 3) Gross Domestic Product (GDP) as reported by the CIA: World Factbook – again selecting the highest and lowest nations. As this study progressed, however, it became evident that certain countries were better-researched and therefore more likely to have gathered statistics or, at least, adequate rationale for statistical absences. Other countries were ruled out due to unique attributes that may have skewed the data results. For example, 80% of Nigerian women trafficked to Italy are from the Edo culture. They do not run from their captors or speak to human rights groups or police because prior to being trafficked they swore in a juju ritual that they would not. The Edo culture believes that if they break the juju promise, they and their families will suffer horribly. This unique aspect of Nigeria means that it may be impossible to accurately evaluate the situation at the present time (Kara, 2009, p. 89-92). As a result, the final country selection was based on the availability and validity of the data as well as time constraints (the research was done over an eleven-week period) and includes: the United States of America, Thailand, and Japan.

## Findings

In order to determine the availability of data focusing on the sexploitation of children, three sources were examined: the Internet, published research and reports, and books. Many of these sources had problems of reliability and validity. The following is a summary of the data available by country.

### Japan: Child Sexual Abuse

The Japanese legally define child sexual abuse as rape of a child under the age of eighteen (punishment varying if the child is above or below the age of thirteen) or engaging in "indecent acts" with a child under the age of eighteen (*Legislation of Interpol member states on sexual offences against children: Japan,* 1999).

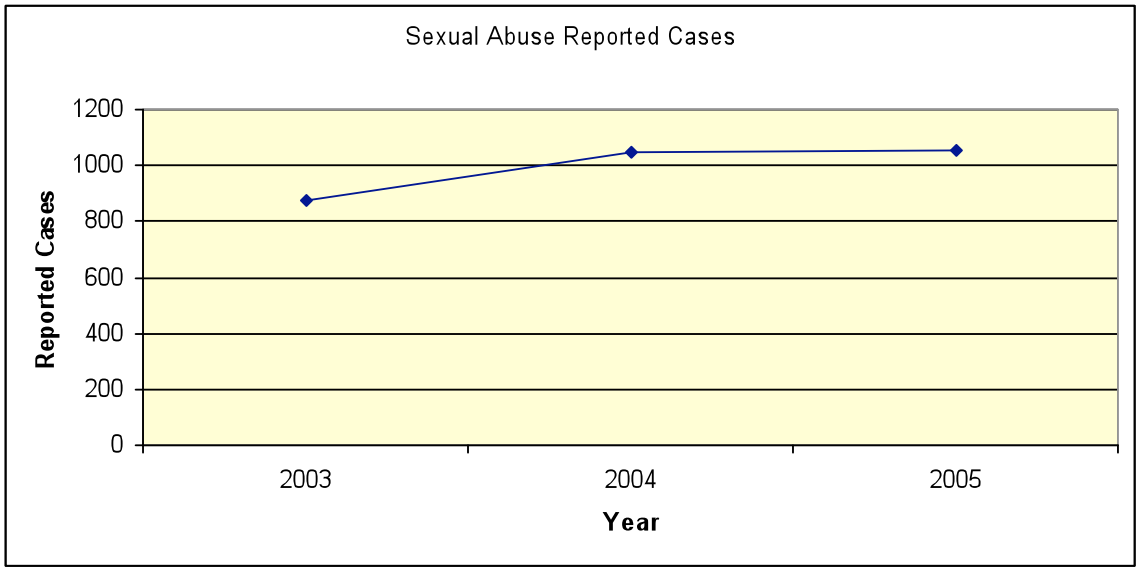
Until recently, the Japanese were either unaware that child sexual abuse existed, or routinely ignored it. It was not until the 1990s that Japan began working to correct child abuse in general (before that, concern revolved around children abusing their parents). Child sexual abuse is generally an even more difficult topic to address, which makes it unlikely that Japanese have, in the span of only two decades, obtained reliable national estimates on the extent of the problem. (Kouno and Johnson, 1995; WuDunn, 1999; Kozu, 1999)

Child sexual abuse is a particularly difficult topic to study in Japan due to the cultural beliefs that 1) the man of the house has a right to do as he pleases with the lesser members and 2) parents are the ultimate authority over their children, and the children

exist to honor their parents (Kouno and Johnson, 1995; WuDunn, 1999; Kozu, 1999; Diamond and Uchiyama, 1999). In a recent case, the Japanese Supreme Court threw out a lawsuit brought by a daughter, on the grounds that her father had the right to grasp her breasts to measure her sexual growth in order to foster the 'trust' that creates a healthy parent-child relationship (Shibata, 2006, paragraphs 2-8). Women and girls in Japan also experience a patriarchal culture that believes the value of a woman is in her virginity and chastity. Thus, rape and sexual abuse are generally underreported for fear of the public shaming that is brought to bear on the victim for letting herself be assaulted (the assumption being that she somehow asked for her rapist to harm her) (McCoy, 2003; Kozu, 1999; Musselman, 2003; Burns, 2005). Japanese law does not address the rape of males, and the age of consent is thirteen, though adults are defined as those eighteen years and over (Diamond and Uchiyama, 1999; *Legislation of Interpol member states on sexual offences against children: Japan,* 1999).

Japan's extreme lack of child sexual abuse data is perhaps indicated best by the fact that the Japanese government does not appear to maintain national child sexual abuse statistics. The next viable option was a child protection group known as the Children's Rainbow Center, and their data provides only the cases voluntarily reported to the Center over the period 2003-2005 (see Graph 1).

**Graph 1: Sexual Abuse Reported Cases**




("Child Abuse in Japan Today, and Measures for its Prevention", 2005)

A related problem in Japan is the high level of molestation that occurs in Japanese trains and subways – the 2000 General Social Survey of Japan revealed that 75% of Japanese high school girls had been groped on trains and subways on their way to school in the past year, and 1,854 men were arrested in 2000 for molesting women and girls on trains (Davidson, 2005, p. 102).

A particular child sexual abuse problem that is believed to be increasing in Japan is father-daughter incest (Shibata, 2006). The increase in this problem is particularly worrisome in light of the fact that as of 1999, incest was not illegal (Kozu, 1999, p. 52).

Reliable national estimates do not exist at this time; at the moment Japan's reported rates of child abuse and child sexual abuse are very low (see Graph 1). Researchers are divided as to the reasons behind this, with some arguing that Japan is naturally less inclined to child abuse, and others arguing that Japan likely has child abuse rates equal to Western cultures. The latter group suggests that the Japanese rates appear low because 1) the problem has only recently been recognized, 2) the Japanese cultural inclination to leave family matters to the families, 3) lack of public understanding that child abuse is a crime (because it has only recently been recognized), 4) shame and fear of repercussions preventing victims from seeking help, and 5) lack of assistance for victims who may be returned by the courts to abusive families (Kouno and Johnson, 1995; WuDunn, 1999; Kozu, 1999; Burns, 2005, p. 49; Kitamura, Toshimori, Kijima, Nobuhiko, Iwata, Noboru, Senda, Yukiko, Takahashi, Koji, Hayashi, Ikue, 1999; Goodman, 2000, p. 171).

**Japan: Child Prostitution**

> The [Japanese] sex industry accounts for 1% of the GNP, and equals the defense budget.
>
> (Hughes, Sporcic, Mendelsohn, and Chirgwin, n.d.)
>
> One third of all reported cases of prostitution are teenagers.
>
> (Hughes et al., n.d.)

The Japanese define child prostitution as

> [t]he act of performing sexual intercourse, etc. (i.e. sexual intercourse an act similar to sexual intercourse, or an act for the purpose of satisfying one's sexual curiosity, of touching genital organs, etc. (i.e. genital organs, anus and nipples; the same shall apply hereinafter) of a child or of making a child touch one's genital organs, etc.; the same shall apply hereinafter) with a child in return for giving, or promising to give, a remuneration to any of the persons listed below:
>
> i. the child;
>
> ii. the person who acts as an intermediary in sexual intercourse, etc. with the child;
>
> iii. the protector of the child (i.e. a person who exercises parental power over the child or who is the guardian or suchlike and who is taking actual care of the child; the same shall apply hereinafter) or a person who has placed the child under his or her supervision.
>
> (*Legislation of Interpol member states on sexual offences against children: Japan,* 1999)

Child prostitution, like child sexual abuse, is an underreported crime in Japan. In the case of child prostitution in particular, the Japanese culture frequently places the blame on the child. Many Japanese prostitutes are wealthy/middle-class, popular, well-liked, smart, and socially active teenagers. In general, these teens have dysfunctional families and feel lonely. To assuage their loneliness and need for acceptance, they advertise themselves for sex on dating sites or through phone clubs, which enables them to obtain companionship and extra money so they can keep up with their peers. This phenomenon, known as *enjo kosai* ("compensated dating") began roughly around 1974, and appears to be flourishing. As a result, the Japanese frequently view these teenage

prostitutes as selfish, greedy, manipulative and morally corrupt individuals, and do not see them as victims (McCoy, 2003). No concrete data appears to exist to indicate exactly how many children are prostituted in Japan, but in the 1980s it is believed that Japan saw a massive increase in the number of prostitutes, especially in the form of trafficking victims from the Philippines and Thailand, and up until 1997 it was still legal to have sex with children in two major Japanese prefectures (Monzino, 2005, p. 24-25; Hughes et al., n.d.).

## Japan: Child Online Sexual Solicitation

> About a quarter of female students aged from 12 to 15 have taken part in telephone chat clubs…The phone conversations usually fix a date to meet and are often a straightforward agreement on the details and price of the particular sexual act to be performed.
>
> (Hughes et al., n.d.)

As of 1999, Japan did not have a law prohibiting child online sexual solicitation, save for a law against utilizing the Internet to commit illegal sex crimes against children (*Legislation of Interpol member states on sexual offences against children: Japan,* 1999). Online Child Solicitation in the United States is frequently noted as occurring in chat rooms. In Japan, this more usually seems to take place on dating sites. Instead of pedophiles pretending to be fourteen years old to lure a child into a relationship, Japanese teenagers frequently initiate contact to deliberately seek out a *enjo kosai* arrangement of companionship for money or gifts (McCoy, 2003; Hughes et al., n.d.).

No research was found that indicated specific estimates of how many teenagers seek out these transactions, but in future research this may be pseudo-estimated by examining research on the rates of Japanese teen dating site usage, the percentage of Japanese teenagers who have met a dating site personality in real life, and the number of current and past dating sites available to Japanese teenagers.

## Japan: Child Pornography

> In Japan, child pornography
>
> means photos, videotapes and other visual materials which:
>
> i. depict, in a way that can be recognized visually, such a pose of a child relating to sexual intercourse or an act similar to sexual intercourse with or by the child.
>
> ii. depict, in a way that can be recognized visually, such a pose of a child relating to the act of touching genital organs, etc. of the child or of having the child touch someone else's genital organs, etc. in order to arouse or stimulate the viewer's sexual desire; or
>
> iii. depict, in a way that can be recognized visually, such a pose of a child who is naked totally or partially in order to arouse or stimulate the viewer's sexual desire.
>
> (*Legislation of Interpol member states on sexual offences against children: Japan,* 1999)

Possession and purchase of child pornography and downloading child pornography off the Internet is not illegal in Japan, although the production and sale were

banned in 1999 and 2004 respectively. Legislation was proposed to ban child pornography possession in 2008, though it had not yet passed as of March 31, 2009, possibly because the Japanese are believed to see these laws as humoring Western moralists rather than as necessary legislation. Many oppose banning possession of child pornography because it may infringe on the right to free expression (Schieffer, 2008; Johnston, 2009).

Regardless of existing legislation, Japan is frequently cited as a haven for child pornography, both online and otherwise (Johnston, 2009; Jenkins, 2001, p. 106; McCoy, 2003). Despite these citations, the data appears to exist based on opinion and hearsay; there is no existing estimate for the amount of child pornography possessed, created, or distributed within the country. One news story suggested that Japan is the world's second largest child pornography consumer, and one of the world's biggest child pornography suppliers (McCurry, 2008; McCoy, 2003). In fact, in 1998, Japan was considered the biggest child pornography producer in the world (Hughes et al., n.d.). Although there are no concrete estimates, and Japan only began keeping records on child pornography in 1999 (McCurry, 2008), there are several ways in which future research can attempt to measure the severity of the problem: number of arrests for child pornography law violations (though it should be noted that this does not necessarily include those who violated both child pornography laws and some other form of child sexual abuse who may be charged solely under the child sexual abuse law), number of victims identified (not number of victims total), and number of child pornography films approved for sale each year. For example, Hughes et al. noted that in 1997 it was reported that 5,000 pornographic films are approved each year by an ethics commission, while 1,000 unapproved (illegal) films are produced each month. These numbers may have decreased following the outlawing of child pornography production in 1999, but the decrease may have been minimal as one pornography producer noted "police don't really bother us" (Hughes et al., n.d.).

Recently, it has been noted that pornography featuring father-daughter incest in particular is on the rise, and has been used several times to facilitate instances of incestuous sexual abuse (Shibata, 2006, paragraphs 13-15).

## Thailand: Child Prostitution and Child Sex Tourism

> More than in any country I visited, it was nearly impossible to avoid sex solicitation in Thailand. At times, the country felt like a giant brothel, even though prostitution is illegal…Thai cultivate sex as business.
>
> (Kara, 2009, p. 153 & 154)
>
> Sex isn't sold everywhere in Bangkok, but [it is sold enough that it is as though] the whole city is an erotic theme park.
>
> (Bishop and Robinson, 1998, p. 7)
>
> There are prostitutes in every country but not to this degree. Not to the extent that men come from all over the world looking for women. Do we want to be a world power in this respect?
>
> (Bishop and Robinson, 1998, p. 21)
>
> Thailand has not become a world sex power, but it has certainly become a world sex magnet.
>
> (Bishop and Robinson, 1998, p. 21)

Thailand defines prostitution as

> The acceptance of sexual intercourse, the acceptance of any other act, or the commission of any act for sexual gratification of another person in a promiscuous manner, in order to gain financial or other benefit, no matter whether the person who accepts such act and the person who commits such act are of the same or opposite sex.
> (*Legislation of Interpol member states on sexual offences against children: Thailand*, n.d.)

Legal punishments are proscribed against those who have "sexual intercourse" with children under eighteen in "a place of prostitution", though the punishments vary depending if the victim is fifteen to eighteen years old or under fifteen years of age (*Legislation of Interpol member states on sexual offences against children: Thailand*, n.d.).

Child prostitution is extremely prevalent in Thailand – so much so that prostitutes solicit customers outside hotels, airports, and restaurants in major urban centers like Bangkok, Chiang Mai, and Chiang Rai. Taxi and tuk-tuk drivers can transport a customer to brothels hosting children of any age desired. Many child prostitutes are refugees or trafficking victims from other countries. Most child prostitutes are post-pubescent; Thai teenagers engaging in sex for money to provide financial support to their parents (Kara, 2009). Despite prostitution being extraordinarily widespread throughout Thailand, exactly how many children (or even adult prostitutes) are involved in the trade is currently impossible to accurately ascertain – in part because the Thai government claims to have no prostitutes, because all prostitution is illegal according to The Act to Deter Prostitution, passed in 1960 when the United Nations abolished legal prostitution (Kabilsingh, n.d.; Bishop and Robinshon, 1998, p. 5; Kara, 2009, p. 167). Ironically, the number of prostitutes and the number of child prostitutes "increased noticeably" after this law was passed. Specifically, prior to the Act, about 15% of prostitutes were between ages fifteen and nineteen. After the Act, it increased to 25% (Kabilsingh, n.d.).

One reason it is believed girls may actively seek to become prostitutes is the potential for higher income – prostitution can pay about twenty-five times the average monthly salary, and it is considered the highest paying female occupation in Thailand. This number varies widely however, and while many female prostitutes do make a significant amount of money, many more do not (Bishop and Robinson, 1998, p. 9). This is important however because the chance to be a high-paid prostitute may contribute to increased numbers of girls seeking the occupation, and more parents encouraging daughters to keep such a job, particularly in times of economic crisis.

Large-scale prostitution catering specifically to foreigners began chiefly in 1964, when the USA installed military bases in Thailand, and in 1967 with the Vietnam War when Thailand agreed to provide "rest and recreation" for American servicemen (Bishop and Robinson, 1998, p. 8). As a result, Thailand began advertising and catering to the foreign sexual appetite. After the Americans pulled out of Thailand, their places as brothel customers were filled by tourists (Monzino, 2005, p. 30).

Thailand had legalized prostitution from at least 1350-1960, and at least one source suggests that prostitution increased in 1905, though child prostitution rates did not appear to be recorded (Lim, 1998, p. 130-131; Kabilsingh, n.d.).

Gender inequality in Thailand and other Asian countries are cited as one of the main reasons for high prostitution and sex tourism rates. With increasing rights for

women in the West, males feel that women are too "aggressive", and thus they seek out the myth of the "docile and submissive" Asian girl. This contributes to the number of girls working as prostitutes as this myth of passivity brings customers to the country (Hall, 1994; Bishop and Robinson, 1998, p. 5 & 10; Lim, 1998, p. 136).

Interestingly, female sexual subjugation in the Thai economy has led to families becoming more appreciative of the birth of daughters, who may now have more social mobility than sons because of their potential sexual value (Bishop and Robinson, 1998, p. 11; Lim, 1998, p. 181).

Thailand's anti-child prostitution campaign launched in 1992 under Prime Minister Chuan Leekpai, who was known for his efforts to improve the living conditions of children. Thailand's 1992 crackdown on child prostitution is believed to have been in part due to the United States threatening to consider revoking trade concessions if Thailand did not address its child labor problem (Lim, 1998, p. 172 & 175; Phongpaichit, Piriyarangsan, and Treerat, 1998, p. 177). A crackdown by Thai police in 1993 did scare child and slave brothels into hiding, but this only means that it is more difficult for law enforcement to find them, and in the end these efforts needed more time and government dedication, a goal thwarted in 1995, when Prime Minister Chuan Leekpai left office. The administration that followed, instead of continuing efforts to eradicate child prostitution, reverted back to the prior government's waffling between ignoring and actively encouraging the Thai sex sector (Phongpaichit et al., 1998, p. 178; Bishop and Robinson, 1998, p. 216; Monzino, 2005, p. 30; Campagna, 1988, p. 147).

Despite the possible decline in the use of child prostitutes in rural areas (Lim, 1998, p. 183), the literature available seems to indicate that it is still unproblematic to find child prostitutes (Kara, 2009, p. 153-156), though some local children have been replaced by increased usage of foreign or ethnic minority youth due to police crackdowns, increased education, and the Thai AIDS epidemic (Phongpaichit et al., 1998, p. 176 & 196). In addition, a survey of rural prostitutes indicated that about one-fifth of the surveyed prostitutes were initiated into prostitution when they were minors. This number can be used as a very rough guide to the number of child prostitutes in Thailand. According to Phongpaichit, the number of prostitutes in 1998 was most likely 150,000-200,000. One-fifth of this number is 30,000-40,000 child prostitutes, which is similar to some prior estimates (Phongpaichit estimated between 25,500 and 34,000 in 1998, and Guest estimated between 30,000-35,000 in 1993) (Lim, p. 183; Phongpaichit, 1998, p. 200). Other estimates, however, have varied so widely (from 13,000 to 400,000) that a seminar was held in 1992 in an ineffective attempt to force social workers and researchers to come to an agreement on a single number (Lim, 1998, p. 172; Reich and Otero, 1996, p. 2; Campagna, 1988, p. 147; Hughes et al., n.d.).

Research on prostitution in Thailand generally blames sex tourism on the prostitution boom, though foreigners are only a small percentage of customers. Sex tourism forms the backbone of the Thai tourist industry, which is Thailand's main international commodity and provides a significant amount of the government revenue (Lim, 1998, p. 183 & 185; Phongpaichit, 1998, p. 196; Kara, 2009; Monzino, 2005, p. 26 & 30). In the 1980s several countries outside of Thailand advertised "package" child sex tours, but it is believed to have declined since, though it is possible they are just more difficult to identify (Lim, p. 184).

The current increased demand for child prostitutes is also believed to be in part due to the AIDS scare and local myths. Thailand has a serious AIDS problem, and as a result virgins and young children are under increased demand under the supposition that they have not yet been exposed to the virus. In addition, rural healers often cite the sexual use of children as "cures" for sexually transmitted diseases like AIDS, and promote the idea that sex with a virgin will renew a man's virility and increase his monetary wealth (Bishop and Robinson, 1998, p. 8; Davidson, 2005, p. 31).

> When the sex services industry became an issue in Thailand during the 1960s, many technocrats and policy-makers brushed it aside. They took the view that when the Thai economy grew, prostitution would become less of a problem, just as in Japan and other more developed countries. Over thirty years have passed. Yet there is no sign that prostitution in Thailand is in decline. Indeed with economic development, increased wealth has *raised* the demand for sex services.
>
> (Phongpaichit et al., 1998, p. 196)

**Thailand: Child Online Sexual Solicitation**

Thai legislation does not provide a legal definition for child online sexual solicitation, but research indicates that most children solicited online in Thailand are in situations similar to those solicited in Japan – the children (usually teenagers from upper-middle class) locate online chatrooms in search of *enjo kosai* ("compensated dating") relationships of goods/money in exchange for sex or companionship, however no numerical estimates were provided (McCoy, 2003).

**Thailand: Child Sex Trafficking**

> Around 80,000 women and children have been sold into Thailand's sex industry since 1990, with most coming from Burma, China's Yunan province and Laos… In 1996, almost 200,000 foreign children, mostly boys from Burma, Laos and Cambodia, were thought to be working in Thailand.
>
> (Hughes et al., n.d.)
>
> The internal traffic of Thai females consists mostly of 12-16 year olds from hill tribes of the North/Northeast. Most of the internally trafficked girls are sent to closed brothels, which operate under prison-like conditions.
>
> (Hughes et al., n.d.)
>
> Like India, Thailand [is]…the primary destination for its own trafficked slaves.
>
> (Kara, 2009, p. 161)

The Thai legal system prohibits trafficking of persons for sexual purposes. In this context, a trafficker is defined as a person who "procures, seduces, or traffics the other person to commit the act of prostitution, even with consent of the other person, no matter whether the commission of various acts which constitute the offence are committed inside or outside the territory of the Kingdom" (*Legislation of Interpol member states on sexual offences against children: Thailand*, n.d.).

Thailand has been trafficking young people out of the country for decades. Phongpaichit's (1998) work suggested that trafficking for sexual purposes increased in the late 1970s, as this was discovered to be more profitable than other forms of

trafficking. By the mid-1990s, Phongpaichit (1998) noted, traffickers increased imports of young foreign women as sex slaves because they were less costly. As a result, young Thai sex workers agreed to be trafficked out of Thailand to seek better pay. In addition, though nearly all child prostitutes in Thailand used to be native Thai, increasing education has led to fewer available child prostitutes. As a result, the late 1990s showed signs of increased trafficking of ethnic minorities and foreign children into Thailand for use in child prostitution (Phongpaichit et al., 1998, p. 176 & 186-187; Hughes et al., n.d.).

**United States of America: Child Sexual Abuse**

The age of consent in the United States is sixteen years of age, though a child is defined as a person below eighteen years. Sexual abuse of a minor is legally defined as engaging or attempting to engage in a "sexual act" with a person above the age of twelve but below age sixteen who is at least four years younger than the person committing the crime. The legal punishment doubles if the victim is less than twelve years of age (*Legislation of Interpol member states on sexual offences against children: USA*, n.d.).

Of all the countries examined in this study, the United States appears to have the most reliable data. This is due, in large part, to Americans acknowledging in the 1970s that child abuse and child sexual abuse was an issue. Other countries, including Japan, did not truly begin assessing the problem until the 1990s or later. Gaps of course exist – for example, no accurate statistics were taken prior to the late 1900s, so although child sexual molestation was prevalent in New York City in the 1930s (Rush, 1980, p. xii), there is no way to know if this trend was national-level, or concentrated solely in New York City. In addition, although the United States appears to have the most reliable and consistent data, the data cannot be taken as an accurate national representation of all cases of child sexual abuse for various reasons

First, child abuse in general and child sexual abuse in particular are extremely underreported – an estimated 90-99% of sexual abuse cases are never reported to the police ("Child Sexual Abuse Goes Vastly Underreported", 2007, p. 1; Flinn, 1995, paragraph 10; "Adults' Responsibility in the Prevention of Child Sexual Abuse", n.d., paragraph 1; Winters, 1998, paragraph 3), and as a result most studies acknowledge that the data observed are a mere fraction of the real problem (Winters, 1998, paragraph 6).

Second, child sexual abuse reports depend on A) someone reporting it, B) someone following up on the report, and C) the follow-up determining if the case is substantiated or unsubstantiated (if sexual abuse is occurring or not). If it is not reported, if the case gets lost in the system, or if the caseworker mistakenly believes it to be unsubstantiated, child sexual abuse cases can be overlooked. In addition, caseworkers, police officers, lawyers, and judges often have different personal definitions of what constitutes child sexual abuse. For example, some organizations consider the crime sexual abuse if perpetrated by a guardian or by someone else in charge of the child (i.e., a babysitter, scout leader, or teacher), but may consider it sexual assault and not sexual abuse if the crime is perpetrated by a stranger or acquaintance. In addition, it may be considered neither sexual abuse nor sexual assault, but rape of a juvenile, which is an entirely separate category (Finkelhor et al., 2008, p. 2-3).

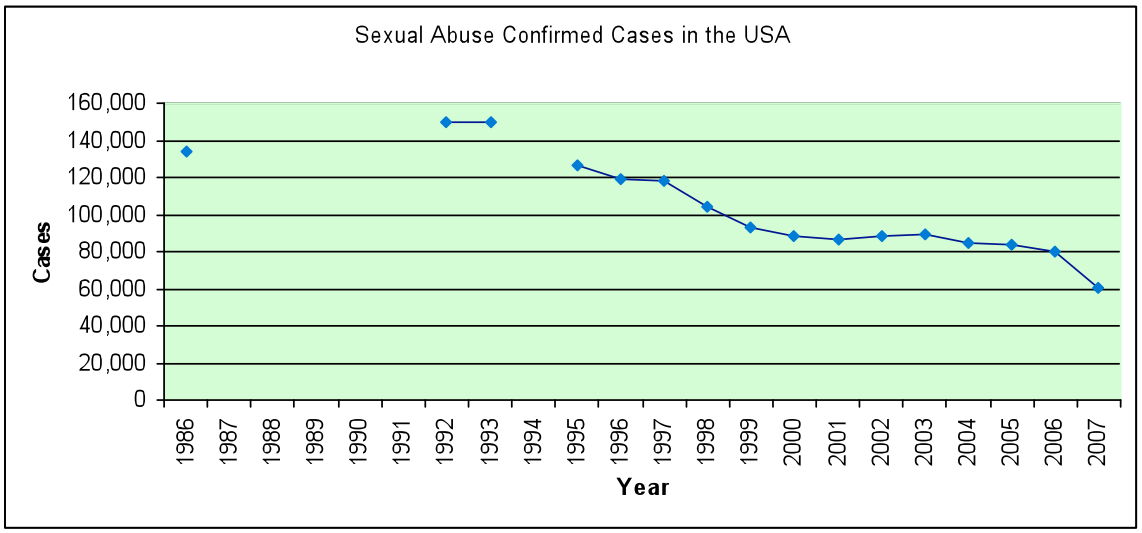
Third, not all states and regions are included in the nationally reported estimates of child abuse victims – the National Child Abuse and Neglect Data System (NCANDS)

collects reports from only 43 to 49 states, varying by year (Jones and Finkelhor, 2001, p. 3).

Fourth, victim recall deteriorates the longer the crime goes unreported (Finkelhor et al., 2008, p. 2).

Finally, estimates are collected from multiple local-level agencies, which send their reports to (in some cases) the National Child Abuse and Neglect Data System. As a result, there is no way short of an extremely vigilant oversight committee to know if these agencies are reporting accurately. Despite this, the national statistics are useful, as they provide a peek at the bigger picture (see Graph 2).

**Graph 2: Sexual Abuse Confirmed Cases in the USA**



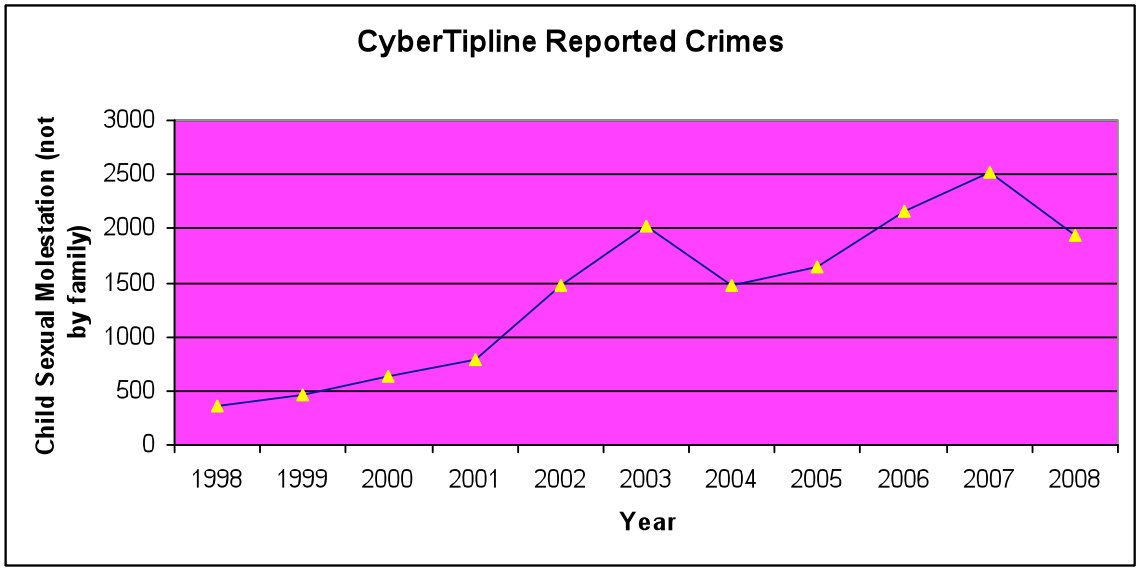

(*Child Maltreatment*, 1999; *Child Maltreatment,* 2000; *Child Maltreatment,* 2001; *Child Maltreatment,* 2002; *Child Maltreatment,* 2003; *Child Maltreatment,* 2004; *Child Maltreatment,* 2005; *Child Maltreatment,* 2006; *Child Maltreatment,* 2007; *Child Maltreatment Report*, 1995; *Child Maltreatment Report*, 1996; *Child Maltreatment Report*, 1997; *Child Maltreatment Report*, 1998; Jones and Finkelhor, 2001; Finkelhor, 1994)

Initial rate increases are frequently attributed to increased reporting as a result of better public understanding of the child abuse problem, though most researchers believe that increased reporting is only a fraction of the reason behind the rise in rates and that child sexual abuse was indeed on the rise. Interestingly, child sexual abuse rates declined rapidly from the 1990s to the present, though researchers are still investigating the cause of the reduced rates of incidence (Jones and Finkelhor, 2001).

The organization CyberTipline, a subsidiary of the National Center for Missing & Exploited Children (NCMEC), provides law enforcement with reports of incidences of child sexploitation. One of their reporting categories is child sexual molestation (not by family members). Graph 3 does not provide an accurate estimate of the number of child sexual molestation incidences per year in the United States, but it does provide a measure of reporting. Theoretically, this also provides some measure of both public awareness of child sexual molestation as a problem, and a measure of public interest in preventing crimes against children. CyberTipline does not investigate these reports, but merely

provides the information to the appropriate authorities. Their main function is as a mediator between the police and the people reporting potential crimes against children (*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009).

**Graph 3: Child Sexual Molestation (not by family)**




(*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009)

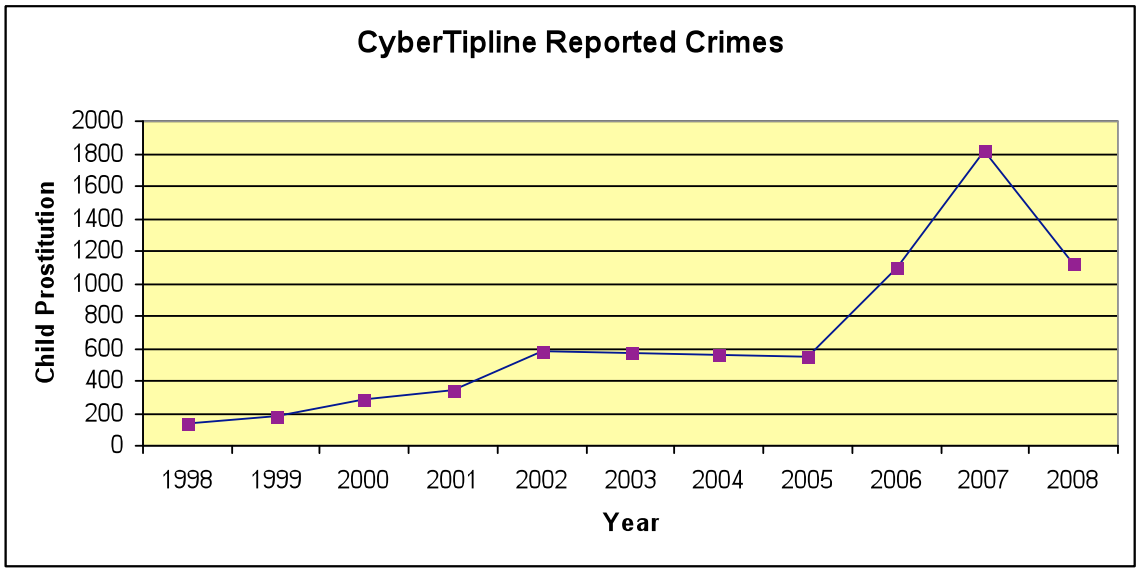
**United States of America: Child Prostitution**

The United States legally prohibits any person from persuading, inducing, enticing or coercing any child under the age of eighteen into prostitution or any other illegal sexual act (*Legislation of Interpol member states on sexual offences against children: USA*, n.d.), but child prostitution, like child sexual abuse, is not a new phenomenon in the United States. For example, Jenkins' work *Beyond Tolerance: Child pornography on the Internet* noted a scandal in Los Angeles in the 1930s involving the trade in underage girls, and that the sale of underage boys was a known problem even in the late 1800s (2001, p. 30).

Many studies have attempted to estimate the number of child prostitutes in the United States. These estimates vary widely, from 1,400 to 2.4 million (*How Many Juveniles are Involved in Prostitution in the US?*, n.d.). What these estimates frequently lack, however, is replicable methodology. These estimates are frequently little better than "guesstimates" and as a result no real numerical national average is known at this point in time (*How Many Juveniles are Involved in Prostitution in the US?*, n.d.).

CyberTipline maintains voluntary reports of incidences of child prostitution, but it is impossible to know who reported each incident, the number of times each incident was reported, or what law enforcement action, if any, was taken to address the reported crime. CyberTipline is strictly a police-assist agency, receiving reports of crimes against children and then disseminating that information to the appropriate authorities. For this reason, the chart below does not demonstrate a real estimate of the problem, but does show increased reporting rates from 2005-2007, with decreased reporting in 2008 (*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009).

**Graph 4: Child Prostitution**




(*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009)

Kara (2009) believes that there is less prostitution in the United States in general due to lack of accessibility.

> [M]arket demand for prostitutes appeared greater in [Europe, Asia, and Latin America] than in the United States. This market demand is assuredly driven in large part by greater supply-side forces. There was more pornography for sale at street corners in Europe, more prostitution visible and easier to access in Asia, and of course, in several of these countries, prostitution is legal in some form or another
>
> (Kara, 2009, p. 184).

Kara's (2009) work suggested that less corrupt law enforcement and judicial systems and the fact that prostitution is illegal in all states save Nevada have led to lower prostitution rates (and therefore potentially lower child prostitution rates) than in many other countries, if only because it is harder to hide (p. 183).

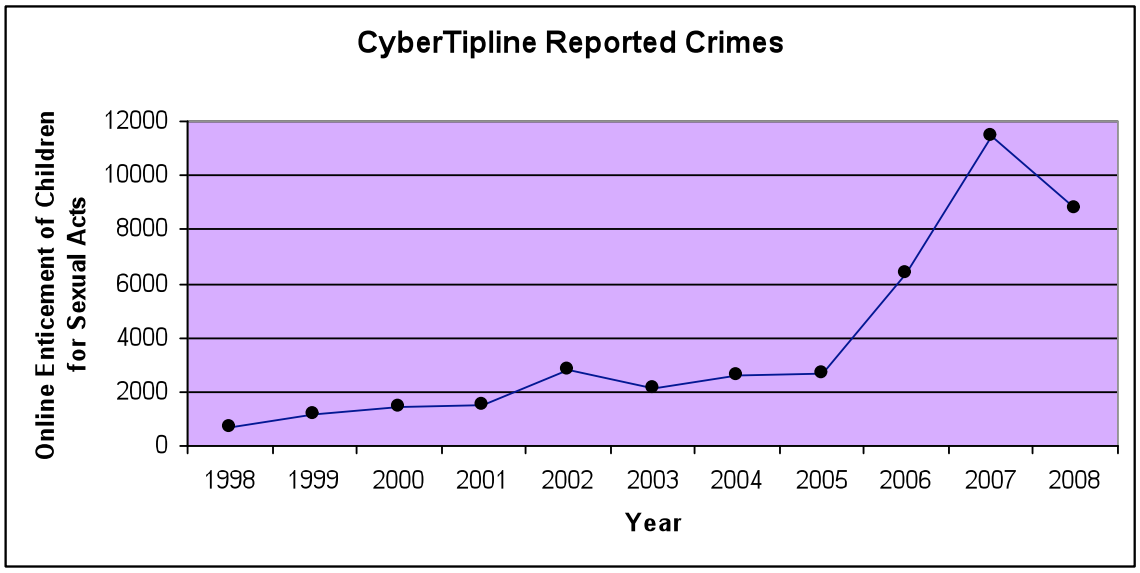
**United States of America: Child Online Sexual Solicitation**

Sexual solicitation of children online is a known problem in the United States, and though few researchers have provided reliable estimates of the number of children victimized in this manner, some data are available. Two particularly significant studies performed by Wolak, Mitchell, and Finkelhor (2006; 2001) provide some estimate of the problem. These studies measured, among other things, sexual solicitations of minors online, defined as "[r]equests to engage in sexual activities or sexual talk or give personal sexual information that were unwanted or, whether wanted or not, made by an adult" (Wolak et al., 2006, p. 3). In 2000, the Online Victimization Survey found that of 1,501 ten to seventeen year olds surveyed from a nationally representative sample, 19% had received unwanted sexual solicitations online within the last year (Wolak et al., 2001). In

2005, that had dropped to 13% (n = 1,500), or approximately 2,970,000-3,720,000 children (12%-15% with p = .05) total in the United States (Wolak et al., 2006).

These two studies involved telephone surveys, and the population was known. CyberTipline also received reports, but the reports to CyberTipline are not solicited samples, but rather the voluntary reporting of concerned citizens. Thus, it is impossible to know exactly what sample of people reported incidents of online child sexual solicitation. It is also not known if any of these numbers indicate multiple reports by the same person, or if any of the reported incidents were substantiated cases of online child sexual solicitation – that is, CyberTipline alerts authorities to any reports they receive and is not informed of the results of any given case; therefore, it cannot be known if these reports resulted in an arrest. Graph 5 therefore cannot be relied upon as a real estate of the problem, but it does indicate an enormous increase in reporting rates from 2005-2007 (*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009).

**Graph 5: Online Enticement of Children for Sexual Acts**




(*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009)

**United States of America: Child Pornography**

> Child pornography in particular is very difficult to observe….[There have been] nude photographs and prints of young teenagers and pre-pubescent children from the Victorian period….It is a fair guess that the first such images appeared very shortly after the invention of photography.
>
> (Jenkins, 2001, p. 31)

Legally, child pornography is "any visual depiction, including any photograph, film, video, picture, or computer…picture, whether made or produced by electronic, mechanical, or other means, of sexually explicit conduct" involving a child (*Legislation of Interpol member states on sexual offences against children: USA*, n.d.). "Sexually explicit conduct includes sexual intercourse, bestiality, masturbation, sadomasochistic

abuse, and lewd exhibition of the genitals or pubic area" (Burgess and Clark, 1984, p. 83).

Ann Burgess (1984) stated that there is no way to accurately calculate the amount of physical child pornography in existence. Due to the hidden nature of sex crimes, especially sex crimes with children, collectors and photographers naturally keep these images hidden. Every year however, police raids result in the seizure of hundreds of thousands of photographs suggesting that child pornography is a booming business (Burgess and Clark, 1984).

The seized photographs, however, may not represent hard copy selling and trading of child pornography – frequently, these photographs (as well as films and audiotape) represent collections either downloaded and printed off the Internet or created by the arrestee (Jenkins, 2001, p. 14).

There is little media coverage of child pornography, online or otherwise, and even less research – mostly due to the fact that it is illegal for anyone other than law enforcement to even view child pornography online. This lack of research is a major problem because it means that law enforcement may not be aware of the changing nature of online child pornography "enthusiasts" and will therefore be unable to catch them. Jenkins' research suggested that the vast majority of these "enthusiasts" are never caught, and most are contemptuous at police attempts at pursuit. It is possible, he wrote, that those who are caught by the police are novices who make silly mistakes or do not yet know the ins-and-outs of child pornography collection. Their mistakes mean that the population of "enthusiasts" under arrest are not the "typical" offender as the police believe, thus leading police to target the minnows while the bigger fish hide in the shoals (Jenkins, 2001, p. 13-16).

Another reason Jenkins believed the majority of offenders are never caught is because law enforcement has yet to adapt to the difficulties of tracking offenders online. For large criminal problems such as drugs, trafficking, smuggling, and money laundering, police infiltrate and take out the leaders to effectively destroy the entire organization. Child pornography collectors do not operate that way. Online child pornography is disorganized, and "enthusiasts" generally have no way to identify one another in real life. "The exceptions to this rule," argued Jenkins, "account for the major law enforcement successes, such as the destruction of the so-called Wonderland child porn ring in 1998" (Jenkins, 2001, p. 16 & 17).

Despite the lack of concrete numbers, analysis of reports over the period of several decades may indicate patterns over time. Jenkins' (2001) work indicated that the "free love" period of the 1960s resulted in temporary acceptance and legality of child pornography throughout the United States and Europe. This resulted in the "ten year madness" period of 1969-1979 in which the production, selling, and purchase of child pornography boomed. The majority of child pornography was believed to have come from Europe and then imported into the United States, though some material was created and sold domestically. Child pornography was extremely prevalent during this time period, such that it was openly sold in stores in various large cities (Jenkins, 2001, p. 31-32).

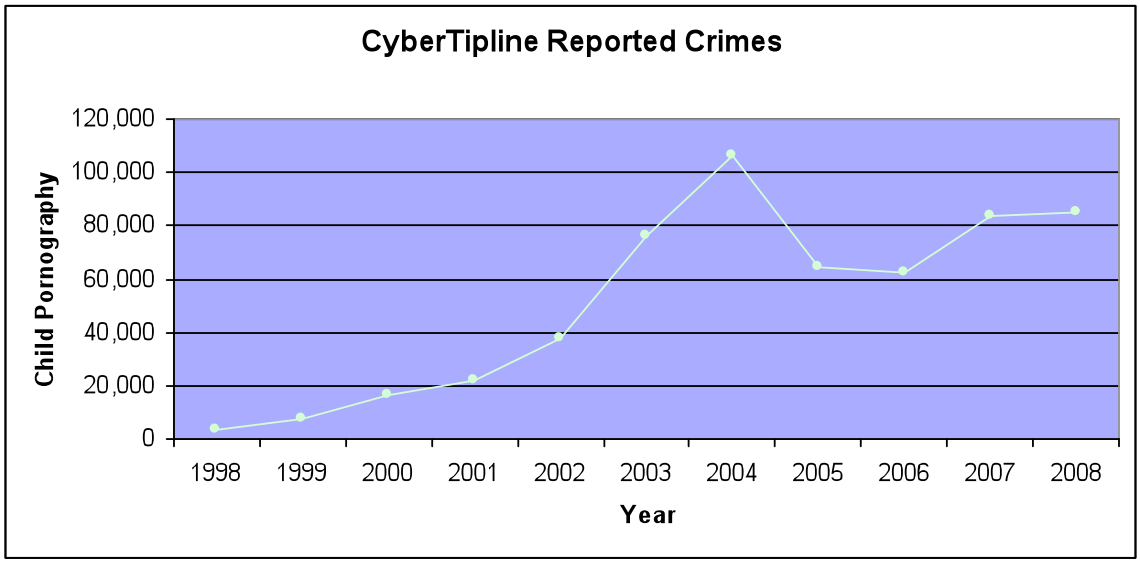
The child pornography boom alarmed moralists who then aroused the American public to prohibit this form of child sexploitation in the late 1970s and early 1980s. The

Chicago police indicated that the pornography they were seizing at the time depicted increased violence and depravity against the child victims (Burgess and Clark, 1984).

Since the advent of the Internet however, the selling of physical child pornography such as magazines and hard-copy photographs seems to have decreased significantly, while child pornography moved online due to the anonymity afforded by webpages, e-mail, and chat rooms (Jenkins, 2001).

As in other areas of child sexploitation, the organization CyberTipline receives voluntary reports on incidences of child pornography. While these numbers still do not provide a measure of the actual problem, they demonstrate reporting and public response levels, as well as increasing awareness of CyberTipline as a resource. As evident below, unlike the other CyberTipline charts, reporting levels peaked in 2004 instead of 2007 (*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009).

**Graph 6: Child Pornography**



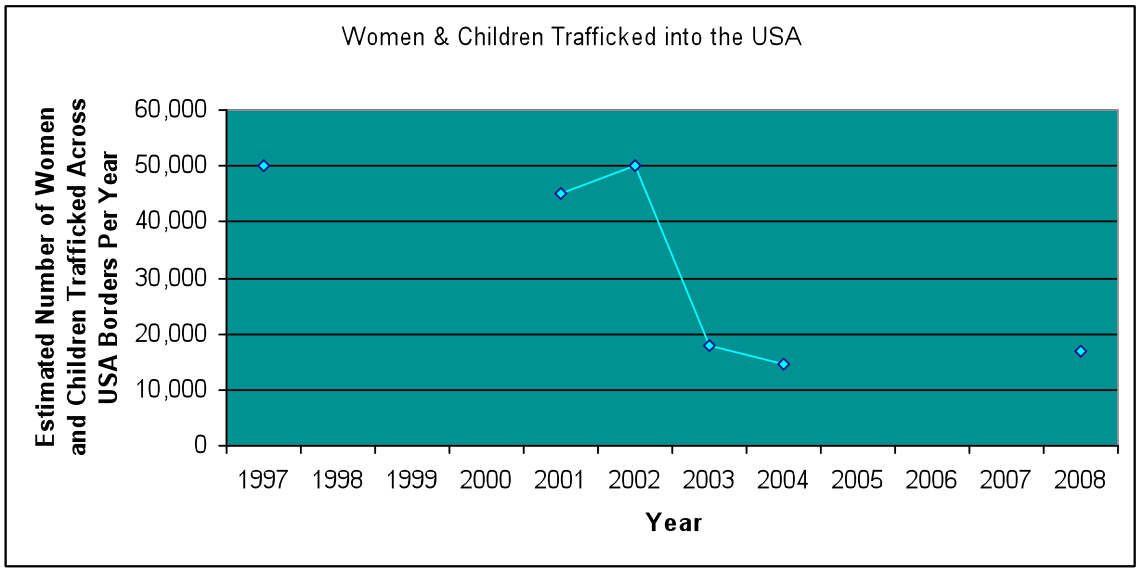

(*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009)

**United States of America: Child Sex Trafficking**

It is illegal in the United States to transport a minor for the purpose of engaging in "criminal sexual activity," and illegal again to traffic children for sexual purposes through "force, fraud, or coercion," which includes harboring, enticing, recruiting, transporting, obtaining, or providing a child for that purpose (*Legislation of Interpol member states on sexual offences against children: USA*, n.d.).

The United States Trafficking in Persons Reports provides estimates for the number of women and children trafficked into the United States during the years 1997, 2001-2004, and 2008 (see Graph 7).

**Graph 7: Women & Children Trafficked into the USA**




(*Trafficking in Persons Report*, 2001; *Trafficking in Persons Report*, 2002; *Trafficking in Persons Report*, 2003; *Trafficking in Persons Report*, 2004; *Trafficking in Humans*, 2009)

The problem with these data, however, is that the Trafficking in Persons Reports do not indicate their methodology. As a result, this study is not replicable and researchers cannot determine the Reports' calculations to ascertain the validity or reliability of these estimates (Clawson, Layne, and Small, 2006, p. 44). However, Ph.D.-candidate Walter L. Layne suggested in a conversation with me in July of 2009 that the methodology may in fact exist, but may not be available to the public. He proposed that it might be a matter of knowing the right department to ask for the data. He also suggested that the year 2001-2002 estimates may be the most reliable due to the high level of government investigation into all areas following the 9/11 attack in the United States.

One experimental study attempted to statistically chart the number of people trafficked into the United States from South and Central America. Their results indicated that around 25,647 females are trafficked into the United States each year from these origin countries – a number greater than the current Trafficking in Persons Report estimate of victims from all locations, but possibly fairly accurate considering the 2002 estimate of 50,000 women and children trafficked into the United States in any given year. However, this was a singular study with experimental methodology. Until the study has been replicated, it is impossible to establish a claim as to its validity and reliability (Clawson, Layne, and Small, 2006).

The number of people actually trafficked into the United States is further complicated by smuggling. Bales' book *The Slave Next Door* (2009) strongly indicates that a significant number – and possibly the majority – of U.S. trafficking victims (though it does not suggest what percentage of these may be trafficked for sexual purposes, or provide a concrete number of victims) smuggle themselves into the United States, upon which they are seized by traffickers and taken cross-country to their destination of

exploitation; thus saving traffickers the cost of smuggling them into the country in the first place (Bales and Soodalter, 2009).

Another gap in the research is seen in the lack of data on inter- and intra-state sex trafficking. Prostitutes and slaves are frequently circulated through cities and states to satisfy customer demand and to avoid police detection. This clever criminal enterprise is difficult to track, and difficult to estimate the scope of (Raymond and Hughes, 2001, p. 54).

Finally, authorities and the public tend to view sex trafficking as the trafficking of foreigners. American prostitutes and sex slaves are frequently ignored, placed outside the scope of statistical estimates, and generally viewed as criminal prostitutes rather than sexual victims (Bales and Soodalter, 2009, p. 80).

Overall, however, despite increased awareness of sex trafficking as a problem, the United States is generally not perceived as a hot-spot for sex trafficking. Where "in most of Europe and Asia, sex trafficking represents 30 to 45 percent of the total amount of human trafficking in a country…in the United States, it represents closer to 15 to 20 percent" (Kara, 2009, p. 183). Sex trafficking appears to be less of a problem in the United States because of the difficulty in transporting people across borders; the increased expense of airplane tickets for trafficked victims from Europe, Asia, and Africa; the fact that all prostitution (save in thirteen counties in Nevada) is illegal in the United States means traffickers cannot hide trafficked victims by claiming them to be "legal" prostitutes; the United States law enforcement and judicial systems are comparatively less corrupt than mainstream sex trafficking nations; and aggressive anti-trafficking legislation (Trafficking Victim and Protection Act – TVPA) created in 2000 (Kara, 2009, p. 183).

Although there has been a great deal of research done on the topic, numerical estimates consistently evade researchers – the data do not exist.

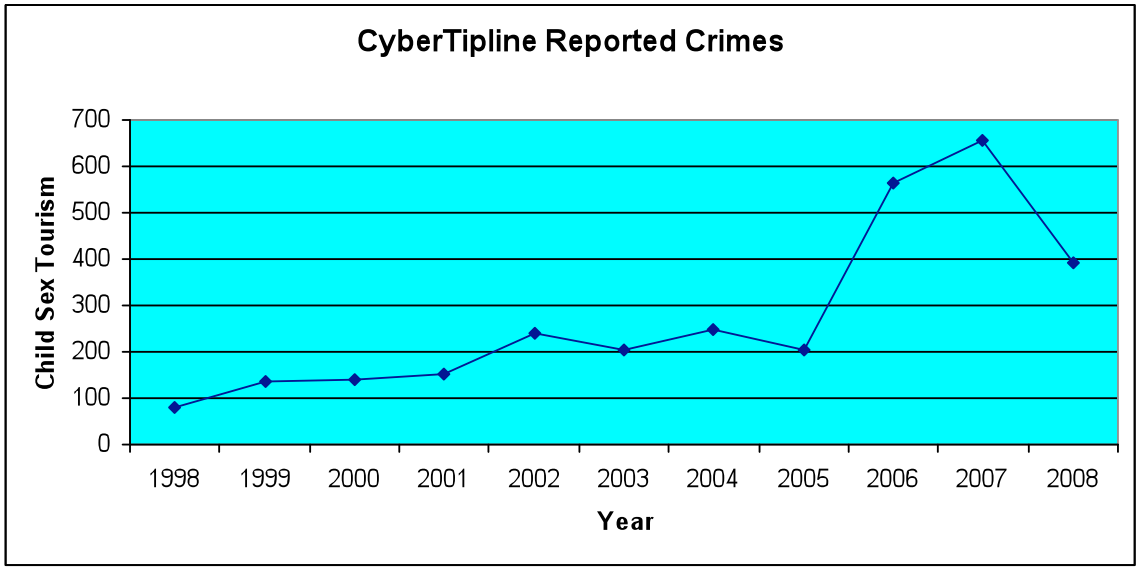
**United States of America: Child Sex Tourism**

It is illegal in the United States for any one to "travel with intent to engage in sexual act with a juvenile," and this is further defined as criminal when "[a] person who travels in interstate commerce, or conspires to do so, or a United States citizen or an alien admitted for permanent residence in the United States who travels in foreign commerce, or conspires to do so, for the purpose of engaging in any sexual act…with a person under eighteen…years of age that would be in violation…if the sexual act occurred in the special maritime and territorial jurisdiction of the United States" (*Legislation of Interpol member states on sexual offences against children: USA*, n.d.).

Although it is widely reported that Americans travel outside of the United States to engage in sex tourism (Bales and Soodalter, 2009, p. 92; ), the incidence of foreigners traveling to the United States to have sex with American children, and the number of American children prostituted outside the country is virtually unknown (Bales and Soodalter, 2009, p. 95). No concrete numerical data exists to suggest how many American (or foreign and trafficked) child victims are used for sex tourism purposes (Bales and Soodalter, 2009, p. 92-95), however CyberTipline did receive reports from 1998-2008 that indicated an increase in reporting in 2006 and 2007, though it decreased dramatically in 2008. These figures do not, however, represent the actual number of

cases, and although CyberTipline defines child sex tourism as Americans traveling abroad to have sex with children, logically speaking there may have been reported cases of not only Americans abroad, but of foreigners within the United States, and of children involved in sex tourism either domestically or abroad ("Reporting Categories", n.d.; *CyberTipline: Annual Report Totals By Incident Type*, 1998-2009).

**Graph 8: Child Sex Tourism**



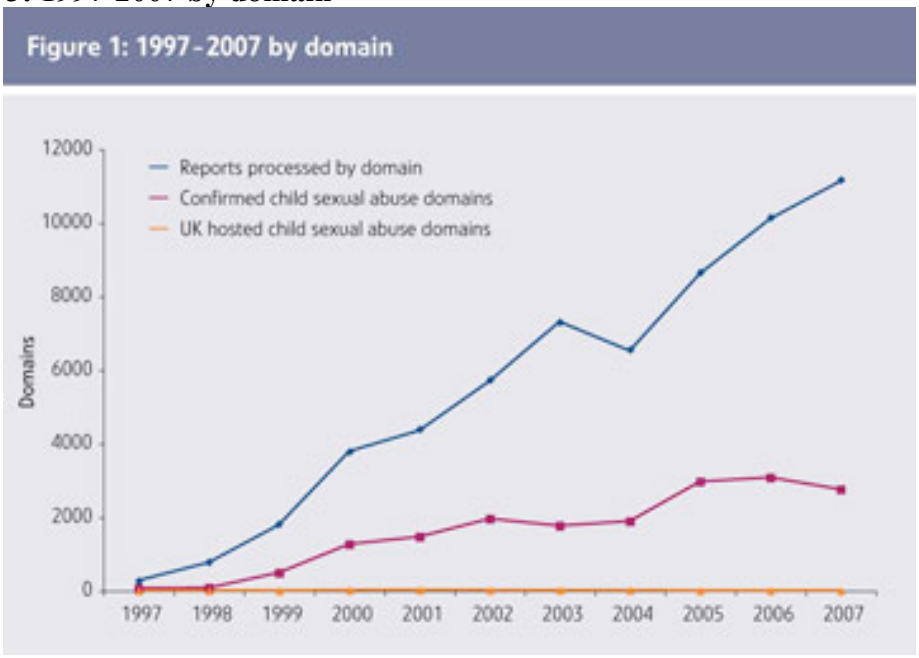

(*CyberTipline: Annual Report Totals By Incident Type*, 1998-2009)

**Findings: Non-country specific**

**Online Child Pornography**

Similar to the CyberTipline program based in the United States, the Internet Watch Foundation (IWF) from the United Kingdom collects reports on child sexploitation, however their focus is solely on online child pornography websites and not individual pictures. Due to alterations in their data collection methods and definitions, the IWF permitted me to access data solely from reports prior to 2008 and 2009. The 2008 report did, however, provide a measure of the online child pornography problem over time, as seen in Figure 3.

**Figure 3: 1997-2007 by domain**




(*Trends 2007*, 2008)

As noted earlier in the literature review, it appears that while reporting is still on the rise, the actual incidence of child pornography online has been fairly stable since 2005. The 2009 report goes a step further, noting the decrease in confirmed child sexual abuse websites over the last two years (*Trends 2007*, 2008; *Trends 2008*, 2009).

## Discussion

The goal of this research was to determine if sufficient data currently exists to create a data set that could, in conjunction with a causal independent variable data set, describe the frequency of child sexploitation by country and to test whether or not variables such as infant mortality rates, fertility rates, and GDP are in fact factors in causal relationships with the data set. The qualitative study of child sexploitation data indicates that either the data do not exist or when data do exist, they have serious reliability and validity issues. In fact, the only categories that appear to have some form of reliable numerical data are child sexual abuse in the United States and online child pornography as confirmed by the Internet Watch Foundation.

This study was limited, in scope and duration. The focus was on three countries in two continents, and not all measures of child sexploitation were examined (child marriage, child temple prostitutes, sexual assault, etc.), however the materials obtained within the course of this research indicates upon review that currently any attempts to assemble adequate data are flawed for various reasons.

First of all, any researcher attempting to replicate current data on this subject would encounter immediate difficulties. Some groups, projects, and researchers have in the past failed to provide sufficient or clear methodology to indicate how their data were gathered, such as the United States Trafficking in Persons Report, ECPAT, and some individual researchers (*Victims of Trafficking and Violence Protection Act of 2000:*

*Trafficking in Persons Report*, 2000-2008; LS, 2003; *Fact Sheet about Child Sex Tourism*, n.d.). Lack of methodology is a serious problem for several reasons. First, lack of methodology means that if the study generates numbers (for example, *Trafficking in Persons Report* of 2002 stated that 50,000 women and children were trafficked into the United States each year) it is impossible for future researchers to replicate the study because detailed data collection information are not presented. As a result, researchers cannot confirm the findings of prior studies, meaning those studies cannot be considered reliable. While it is hoped that researchers do not simply guess to obtain these estimates, without a methodology it is impossible to tell if the researcher has a solid reason for using this numerical estimate. Furthermore, the average, unvigilant reader is likely to assume the researcher is a credible source. The average citizen's belief in the infallibility of research leads to unreliable numbers being cited in the media, in policy formulation, and in future research, especially if the numbers were generated by the government – the *Trafficking in Persons Report* is a case in point. If these numbers have no evidentiary basis, data can be horribly skewed, and it becomes impossible to ascertain the validity of research.

A particularly controversial area of child sexploitation measurement involves estimating the number of child prostitutes in the United States, which according to How Many Juveniles Are Involved in Prostitution in the U.S.? is based almost entirely on "guesstimates" such as the following:

> The General Accounting Office (1982) found that the "general perception" estimates ranged from "tens of thousands to 2.4 million." One set of estimates from 1982 seemed to trace back to the "gut hunches" of Robin Lloyd, the author of the 1976 book, "*For Love or Money: Boy Prostitution in America*," who used a working figure of 300,000 male juvenile prostitutes. The President of the Odyssey Institute adopted this figure, then doubled it to cover female juvenile prostitutes, increasing the estimate to 600,000. Because the Odyssey Institute president believed that only half of juvenile prostitutes were known, the 600,000 figure was doubled; the estimate was doubled once more to 2.4 million because the president believed that the estimate did not include 16 and 17 year old prostitutes. These were all just hunches without scientific basis.
>
> (*How Many Juveniles Are Involved in Prostitution in the U.S.?*, n.d.)

If policy makers, law enforcement, researchers, the media, and the general public are not receiving accurate statistics, misleading conclusions are formed. It becomes impossible to accurately assess the problem, and continuous citation of faulty statistics grants these numbers an air of validity, reliability – in effect, the numbers gain a life of their own, corrupting the data of the unsuspecting researcher. In essence, rather than promoting the agenda of child protection groups, research that lacks scientifically supported methodology serves to effectively tie the hands of those working to end child sexploitation. Unable to determine the accuracy of hypotheses, policy makers must then rely on conjecture and "guesstimates," leading to the creation and maintenance of ineffective laws that might have been avoided had correct research been conducted.

Secondly, some of the available data are not dated. The report *Child Sex Tourism in Thailand* (n.d.) by ECPAT UK says that child prostitution declined in Thailand "over the last three years", but without a date to indicate when the report was released, it is

impossible to know which three years were implied in the results. A similar case involved the *Fact Sheet about Child Sex Tourism* (n.d.) by ECPAT-USA, which indicated that two million children are exploited worldwide, but did not provide a date for when they considered this data to be applicable.

Third, due to a lack of concrete definitions of the 'child' and of the various sexploitation categories (in particular 'sexual abuse'), many studies may have skewed or not entirely inclusive data. For example, some studies provide estimates of the number of women prostitutes in Thailand (Muecke, 1992, p. 892; Phongpaichit, 1998, p. 197-201; ), but reviewing these studies and various newspaper articles on Thai law has indicated that fifteen-year-old girls are generally considered 'women', and no definition of 'woman' is provided in the research (Bishop and Robinson, 1998, p. 7; Phongpaichit, 1998; Kara, 2009). Related to this is the problem in many child abuse surveys, which frequently only involve children between certain age groups. For example, the National Crime Victimization Survey applies to children ages 12-17, and the Online Victimization Surveys of 2000 and 2005 were administered to children ages 10-17 ("Crime and Victims Statistics", 2008; Wolak et al., 2001; Wolak et al., 2006).

Fourth, media hype and overzealous attempts to generate support to fight child sexploitation may have led to corrupted data. This may have led to the decline in providing replicable methodology. The creation of these "guesstimates" has led to the media repeating non-replicable numbers to the uninformed public, and has resulted in other researchers citing these unscientific statistics over the past several decades (*How Many Juveniles Are Involved in Prostitution in the U.S.?*, n.d.). As a result, research is bogged down by unreliable data and information which cannot be replicated. This has led to the hysterically repeated mantra of "children as young as" three, four, five, six, or seven; "have sex with as many as" ten, twenty, forty; and claims of the child sexual abuse "epidemic" used to try to generate public outrage (Jacobs, n.d.; Walker, 2002, p. 183; Baker, 2004; *Brief Analysis and Business Model*, n.d.; Russell and Bolen, 2000; Back and Lips, 1998; *Debt Bondage*, 2005-2009). On average, commercially sexploited children are around the age of fourteen, particularly if they are involved in prostitution (Donkor, 2007; Schetky and Green, 1988, p. 159). It is children who are sexually abused (not for money) that are generally under age 12 (Estes and Weiner, 2001, p. 15). Although it is true that extremely young children have been brutally raped (*Debt Bondage*, 2005-2009; Baker, 2004; Jacobs, n.d.; *Brief Analysis and Business Model*, n.d.), they are not the majority, and their abuse can be perpetrated by anywhere from having sex with one man in a year to forty in one night, depending on each child's particular situation. Most importantly, while there may or may not be child sexploitation of "epidemic" proportions, it does not need to be proclaimed "epidemic" to generate support. Child sexual abuse is a horrific crime, but it is still "unnecessary and unethical" to attempt to generate fear in order to generate support for a cause (Montgomery, 2001, p. 33-39). This is not intended to attack the integrity of every study concluding or citing child sexploitation as "epidemic," but is intended as a warning to those studies that lack sufficient methodology to support their findings.

Fifth, many countries have only recently recognized child sexploitation as a social problem, such as Japan, which is still debating the potential severity of child sexual abuse in their country. A related issue to this is the tendency to undercount teenage victims of prostitution, sex trafficking, sex tourism, and online sexual solicitation because of the

belief that these victims were the perpetrators of the crime or were otherwise "asking for it" to happen.

Sixth, data are difficult to find. For example, when searching for statistics on estimated numbers of child prostitutes, much research on estimating child prostitutes provided no numerical estimates at all (reliable or otherwise), and instead I found a list of estimated child prostitutes in a study on the global health burden of child prostitution (Willis and Levy, 2002).

Seventh, there may be no real way to obtain solid numbers needed for much of the data set. It is impossible to find every abused child, and even those found may not be willing to admit to their abuse. Even fewer are likely to be willing to tell a stranger what happened to them, particularly if that stranger is likely to report the crime (and thus make life more difficult), and if the abuse was committed by a relative or friend.

Reporting rates also depend heavily on who victims believe is conducting the survey or interview. In particular, fewer incidences of child sexploitation are reported in the Uniform Crime Reports (police reported data) than in the National Crime Victimization Survey (volunteered data). This is generally due to the fact that sex crimes are severely underreported to the authorities. Volunteer surveys allow anonymity for victims who are unwilling to press charges or who fear retaliation or embarrassment should they admit to their abuse to the government (Weisel, 1999).

Due to the hidden nature of crime in general, and sex crimes in particular, it is difficult to discover if that nice restaurant in Bangkok had a child purchasable by the hour, or if this or that massage parlor was actually a legitimate business (Burgess and Clark, 1984, p. 1). In addition, studies of this magnitude (national-level research, and international cooperation for sex trafficking and sex tourism research) would require significant amounts of money, manpower, and time. Increased research and policies also face difficult civil rights questions – Japan, for example, is reluctant to legislate against downloading child pornography off the Internet for fear it conflicts with citizens' right of expression (Johnston, 2009). However, many of the current research issues can be addressed in future research attempts.

**Policy Implications**

Solution 1: The lack of clear methodology can be corrected simply by including a methodology. Even if the study is tentative and based on 'guesstimates', researchers can still provide explanations for the rationale behind each guess.

Solution 2: Always include the date that the research was conducted and published, either in a forward, on the title page, on the copyright page, or at the head of every page in order to avoid confusion such as that seen in the *Child Sex Tourism in Thailand* (n.d.) study noted earlier.

Solution 3: At minimum, each nation should have a specific definition for "child", "sexual abuse", "sexual assault", "child prostitution", "child sex trafficking", and all other categories of child sexploitation. Research conducted in that country should be legally required to either use the national definition (and indicate this in their methodology) or if researchers choose to use a different definition they must indicate it specifically in their methodology, as well as providing the legal definition. All studies involving "men," "women," "young adults," and "adults" should also define these terms,

and surveys of all categories should specify the age group that responded so that the reader can determine what proportion of the population was actually involved in the study.

Solution 4: Researchers should not exaggerate results, even if they think it necessary to garner public interest. Exaggerated results are, statistically speaking, useless results. To examine how this problem evolves over time, researchers need to have numbers and attitudes as close as possible to reality. Skewing the data is tying the hands of people who want to help end child sexploitation.

Solution 5: Countries that have recognized child sexploitation as a serious issue should encourage other countries to acknowledge it as well. Instead of restricting research findings to colleagues, sexploitation research should be prominently displayed for other countries to see, so that myths of children tempting adults to sexually abuse them can be swiftly exorcised.

Solution 6: There is very little that can be done about the problems inherent in all research – and particularly in criminal justice-related research – save for researchers to do the best they can, for research to be replicated in new studies, and for a continuous open debate concerning all research results. As for civil rights issues, countries will need to determine for themselves which is more important – the right to download child pornography, or the right of the child to not be a pornography model.

All of these research issues need to be addressed, but initiatives must also be made at the grassroots, national, and international levels to improve understanding, reporting, and information sharing. For example, at the local level the general public needs to be more informed, local police need to be educated and kept up-to-date on research and policy advances, and definitions and crime severity should be made clear, and mistaken notions of the child 'criminal' prostitute disabused.

At the national level, countries need 1) universal definitions on 'child' and the various aspects of sexploitation, 2) large yearly surveys of a nationally representative random sample of children, 3) annual child sexual abuse and sexual assault reports in conjunction with providing annual statistics on how many people were arrested for each sexploitation crime, how many victims were determined for each crime by category, victims' citizenship status (to determine if some might be trafficked), perpetrators' citizenship status (to determine if some might be sex tourists), and the amount of pornography seized (or in the case of countries like Japan, observed entering and leaving the country) and pornography victims identified. These annual reports in particular should be a singular national report with all the data in one easy to find location. Local-level efforts to dispel incorrect beliefs about child sexploitation and all future sexploitation research rely on this data being available to everyone. These reports should be as prominent and reliable as the National Crime Victimization Survey (NCVS).

At the international level, there should be an organization, possibly a new subsidiary of the United Nations, or even maintained by UNICEF, that operates (at the very least) a website containing multiple translations of all available research on child sexploitation. These translations should be stored in a searchable database. A international databank of sexploitation research is necessary to fully analyzing the problem and creating a true data set. Once enough information is obtained, this data set can be translated into graphs, allowing the problem to be tracked nation-by-nation and internationally, eventually globally. Graphed data will also mean that instead of mere

hypotheses and logic, researchers can obtain a solid statistical view as to what structural factors either impact or are impacted by child sexploitation. This would be an invaluable resource to policy makers and law enforcement, because then there would be fuller understanding of what social problems must be addressed to eventually eliminate child sexploitation.

One of the main reasons cited for the 9/11 disaster in the United States was lack of communication between agencies. Child sexploitation will persist in part because research is scattered, difficult to obtain, inadequately categorized, and has non-replicable methodology. A topic as complex as child sexploitation requires not only law enforcement cooperation, but cooperation between researchers – to share both data and methodology in a comprehensive manner.

**Plans for Future Research:**

Time constraints and the lack of an acceptable numerical data set resulted in a reduced data set on sexploitation of children. In the future, I would like to examine more countries (such as India, Germany, and Australia) and all categories of child sexploitation. In the meantime, I expect that research can begin to create an adequate data set that can be utilized in future papers.

Specifically, I would like to conduct a larger study with a two-part methodology: first through a qualitative content analysis to collect the child sexploitation numerical data set, and second through a quantitative data analysis.

Several hypotheses can be postulated from prior research. A visual depiction of these hypotheses can be seen in Appendix A, but the hypotheses themselves are as follows.

Hypothesis 1: Countries with 1) higher Infant Mortality Rates and 2) more boy than girl infants indicate 1) lack of child support (nutrition, medicine, etc.) by the government, 2) poverty leading to lack of nutrition, disease, and increased danger (*Report of the Field Visit to Kenya by Members of the Bureau of the Executive Board*, 2009, p. 3), and 3) patriarchal society valuing boys over girls, in which girl children in particular are likely to be seen as a financial burden (Kara, 2009, p. 8, 31, 76, 125, & 172-173). Thus, I hypothesize that countries with higher IMR will have higher child sexploitation rates: poverty means increased stress, parents out of work, and parents escaping their troubles through alcohol/drugs, and thus parents will be more likely to abuse their children (Joubert, P., 2007, paragraphs 22-24). Increased likelihood of abuse means increased likelihood of sexual abuse. Poverty also means there may be a need for the children to work and support their families financially. Parents are more likely to send their children to find work in cities, sell their children outright, or to agree to send them with an 'agent' promising a good-paying job. This makes them vulnerable to exploitation, kidnapping, and trafficking, and thus vulnerable to being sexually exploited through prostitution and sex trafficking. If they are prostituted, children are also more likely to be used in child pornography and be subject to sex tourism. Since IMR may indicate a lack of government support, it can logically follow that law enforcement may 1) be corrupt or 2) be understaffed or lack training and thus unable to quell higher rates of child sexploitation. If the society is patriarchal, valuing boys over girls, parents may either willingly send their daughters into situations where they are more likely to be prostituted

in exchange for her paycheck or a single lump sum, may sell their daughters outright, or may (upon discovering the 'job' was actually prostitution) instruct the girls to continue working so that they can continue to receive a portion of their daughters' paychecks. Finally, countries in which the practice of paying dowries upon a daughter's marriage is still in practice may result in parents selling their daughters simply to avoid having to pay a dowry they cannot afford (Kara, 2009, p. 8, 30-32, 52, 60-64, 66, 71, 76, 173-174, 181-182, & 184).

Hypothesis 2: Following the same logic for Infant Mortality Rates, I hypothesize that countries with higher Under-5 Mortality Rates will have higher rates of child sexploitation.

Hypothesis 3: I expect that higher rates of people living with HIV/AIDS will result in greater rates of prostitution in general. Greater rates of prostitution indicate greater rates of child prostitution, and therefore of child pornography and child sex tourism. Higher rates of HIV/AIDS may also indicate not only increased rates in children born with HIV, but reflect increased sexual abuse of children by infected adults. Also, higher rates of HIV/AIDS among prostitutes generates more demand for younger prostitutes in the belief that the younger the prostitute, the less likely the prostitute has had the chance to contract HIV/AIDS, therefore less risk to the customer. In this way, HIV/AIDS generates greater demand for child prostitution. Countries with increasing HIV/AIDS rates will have increased child sexploitation (Kara, 2009, p. 49-50).

Hypothesis 4: Poverty-stricken countries are frequently those with dramatic increases in population. A rapidly increasing population means the largest proportion of the population will be children, which means more mouths to feed and fewer workers to support them. Impoverished countries with too many children may lead to children having to work (and thus being more vulnerable to exploitation and trafficking) or parents being forced to sell their children or make their children find work – making them vulnerable to exploitation (Kara, 2009, p. 8, 62-64, 66, 108-110, 113-117, 164, 168-172, & 191; Harris and Robinson, 2007, p. 6). Chronic poverty and stress may lead more parents to sexually abuse their children (Joubert, P., 2007, paragraphs 22-24). Finally, increased populations may mean more girl children having children of their own as a result of being sexually exploited (through prostitution, rape, sexual abuse, or child marriage) (Lim, 1998, p. 131; ), so I hypothesize that country population booms will be accompanied by increased rates of child sexploitation.

Hypothesis 5: Countries with low Gross Domestic Products (GDP) are more likely to have impoverished, stressed populations vulnerable to exploitation, trafficking, and domestic violence. Thus, I anticipate that countries with chronically low GDPs will have higher child sexploitation rates (Kara, 2009, 108-110, 113-117, 164, 168-172, & 191; Harris and Robinson, 2007, p. 6). In contrast, countries with higher GDPs may mean more people with computers, and thus more Internet access. It can thus be hypothesized that countries with high GDPs will have higher rates of online child sexual solicitation.

Hypothesis 6: Countries with low life expectancies are likely countries that have poor standards of living, poverty (increasing malnutrition, medical problems, and economic desperation), exploitation (leading to early death through overwork), and stressed populations (Feinstein, 1993, p. 279; Harris and Robinson, 2007, p. 6). Earlier adult death may mean that there are more orphans, who are particularly vulnerable to exploitation and abuse (*Victims of Trafficking and Violence Protection Act of 2000:*

*Trafficking in Persons Report*, 2005, p. 17; Kara, 2009, p. 113-117). All of these factors foster the hypothesis that countries with low life expectancy will have higher rates of child sexploitation (prostitution, sexual abuse, sex tourism, pornography, and sex trafficking).

Hypothesis 7: High fertility rates indicate rapidly growing populations, which can lead to too many children for parents to afford. This puts parents at risk for sending their children to find work, or contracting with an 'agent' to take their children to a job elsewhere. Both situations increase the odds that children will be sexually exploited (Kara, 2009, p. 8, 62-64, & 66). In addition, mothers with multiple children but no male partner may not have enough income. If they gain a male partner who can provide them with the means to survive, the mother – and therefore the child – may find it necessary to stay in his household even if he sexually abuses the child (Joubert, 2007). I hypothesize that countries with high fertility rates will also have high child sexploitation rates.

Hypothesis 8: Countries with low school life expectancy may be countries riddled with poverty and illness. Children may not be able to attend school either because they cannot afford school, they cannot afford school materials, or they need to work to provide money so their families can eat, or so that younger siblings may attend school instead (Ranjan, 1999). Children who must work are more vulnerable to being trafficked and exploited, so I hypothesize that countries with low school life expectancy will have higher rates of child sexploitation. In addition, if the country has higher school life expectancies for boys than girls, it means that girls do not get an equal education, either because they become pregnant at an early age (and have already been sexually exploited), because the culture does not believe girls need an education, or because if the school costs money and boys are considered more valuable than girls, the boys get priority. The only value girls may have to their families in a patriarchal society is their ability to earn money (Kara, 2009, p. 8, 164, 175-176). Therefore, I expect that countries with higher school life expectancies for boys than girls can expect higher rates of sexploitation of girl children.

Hypothesis 9: Poor countries generally mean a lower profit from agriculture. This results in rural farmers moving to large cities in search of work. If work is not available, economic desperation may drive parents to sell their children, send their children to find work, or agree to let another adult take their children to a 'job.' Though some jobs are valid, children risk being trafficked or exploited into virtual (or real) slavery, and increase their risk of being sexually exploited. Since, theoretically, increased urbanization may be an indication of increased economic desperation; I hypothesize that highly urbanized populations will also have high rates of child sexploitation (Kara, 2009, p. 8, 62-64, & 66; de Janvry and Sadoulet, 2000).

Hypothesis 10: Countries with: 1) police human-trafficking units, and 2) good funding for these units, are likely to be more invested in the success of preventing human trafficking. Therefore, they are likely to be more aggressive when investigating, prosecuting, and convicting (Kara, 2009, p. 80, 167, & 183-184). I expect that countries with good funding for human trafficking police units will have lower rates of child sex trafficking.

Hypothesis 11: I hypothesize that the number of Internet users will be directly proportional to the number of children sexually solicited online.

Hypothesis 12: Refugees and Internally Displaced Persons (IDPs) are extremely vulnerable to exploitation and abuse. Refugees are impoverished and lack stability. Children in particular are vulnerable if they are separated from their families or are orphaned. They may be kidnapped or persuaded to leave with a sex trafficker. They may be forced into prostitution. Since refugee camps are filled with poverty-stricken people in stressful conditions, sexual abuse and rape are also more likely (Kara, 2009, 169-172; *Sierra Leone*, n.d., http://www.dol.gov/ILAB/media/reports/iclp/tda2001/sierra-leone.htm; Harris and Robinson, 2007, p. 6). For these reasons, I hypothesize that high numbers of refugees will mean higher rates of child sexploitation in prostitution, sex trafficking, pornography, sexual abuse, and sex tourism.

Hypothesis 13: Governments that devote a higher percentage of their GDP (purchasing power parity) to preventing human trafficking are, theoretically, more invested in seeing human trafficking cease. This means more investigations, a more informed public (and thus 'good Samaritans' helping trafficking victims), more prosecutions, and more convictions (Kara, 2009, p. 196). Therefore, I expect that countries with a greater percentage of anti-human trafficking expenditures will have lower child sex trafficking rates, and possibly lower child prostitution, child sex tourism, and child pornography rates.

Hypothesis 14: When countries are engaged in war or civil conflict, some portion of the population may be displaced, abducted by the enemy, or killed. More refugees will mean higher sexploitation rates (Kara, 2009, p. 169-172). Abduction of children by the enemy increases children's likelihood of being prostituted to the enemy or raped while doing forced labor, or being sold either within the country or into another nation. Being sold increases the likelihood of prostitution (and thus pornography and sex tourism), sexual abuse by an owner, and sex trafficking (*2002 Country Reports on Human Rights Practices: Sierra Leone*, 2002, http://www.state.gov/g/drl/rls/hrrpt/2002/18225.htm). The death inherent in war means children may be orphaned, making them more vulnerable to sexual abuse by relatives, being sold or otherwise exploited by relatives (such as in the Haitian "restavec" system), being trafficked by a stranger, or tricked into working in a brothel (Sage and Kasten, 2006, p. 12; Bales, n.d., p. 107). Also, militaries generate high demand for prostitutes, which leads to more sexual exploitation and rape (Kara, 2009, p. 23). I hypothesize that war and civil conflict will lead to increased child sexploitation rates.

Hypothesis 15: I hypothesize that countries with laws prohibiting child sexploitation coded (see content analysis coding procedure in Appendix C) at three or below will have higher sexploitation rates because it is likely that countries with weak laws will have weak enforcement. Weak laws and weak enforcement will translate to greater crime, and a larger number of illicit but not nationally illegal activities – for example, if it is not illegal in that country to have sex with a child (Kara, 2009, p. 78-79, 103-104, & 195).

Hypothesis 16: I hypothesize that countries coded with a four or below in Women's Status/Rights (see content analysis coding procedure in Appendix C) will have higher sexploitation rates, because if women are considered to have little to no value, children may be even less valued – especially girl children. The most value these children may have is in how much money they can provide their parents, leading them to be more vulnerable to sexual exploitation. In addition, violence against women and girls

may drive them to flee the country in any way they can, even if it means risking being trafficked into slavery or prostitution (Kara, 2009, p. 8, 31, 125 76-77, 124-125, & 164).

These hypotheses would be tested through quantitative data analysis of both numerical data and a content analysis coding procedure (see Appendix C). The quantitative analysis would involve an Ordinary Least Squares Regression procedure ($y = a + bx$) by comparing Independent Variable structural factors to the Dependent child sexploitation data set. The structural factors, charted over the same time period as the data sets and selected according to the research-supported hypotheses indicated above, are defined in Appendix B.

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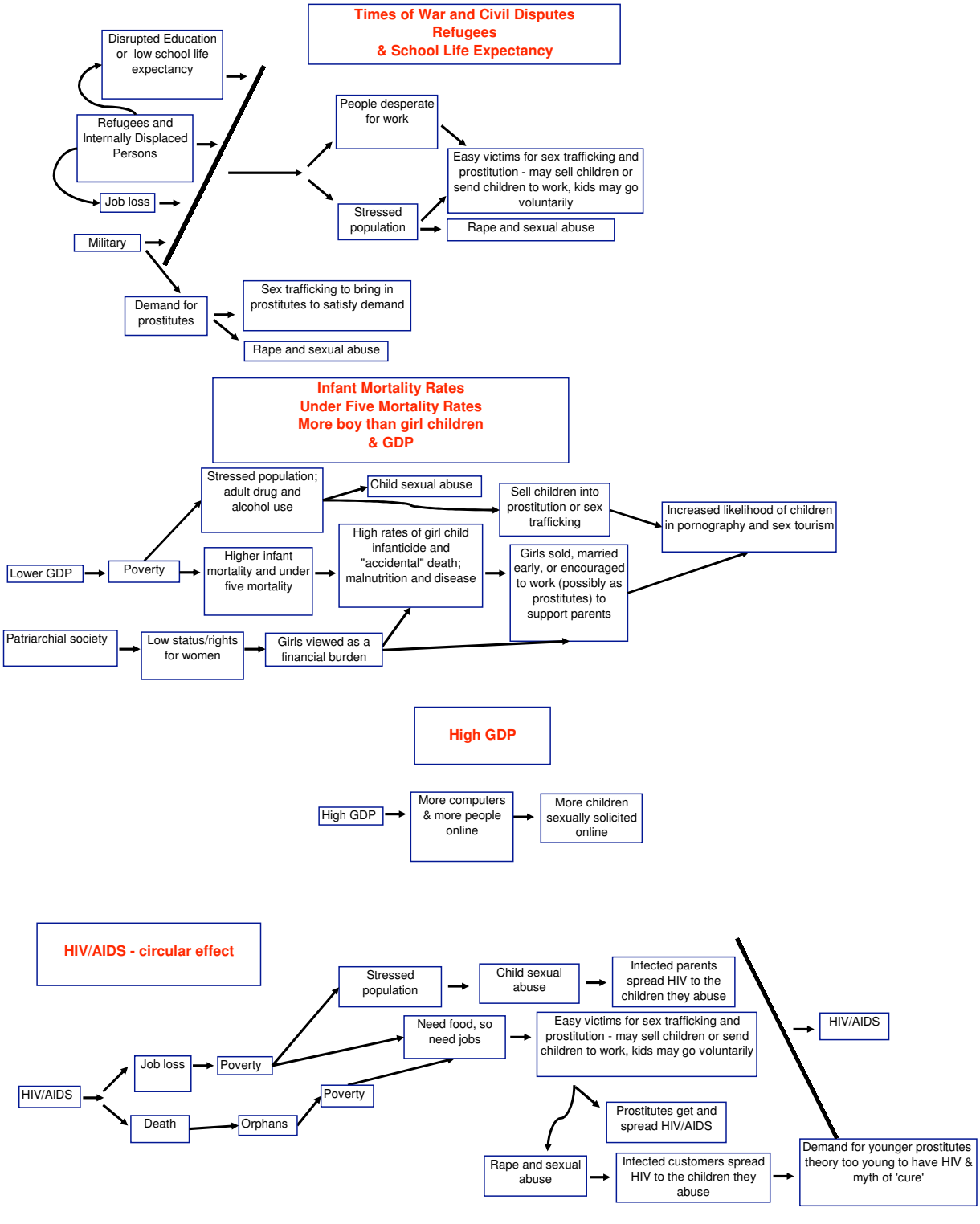
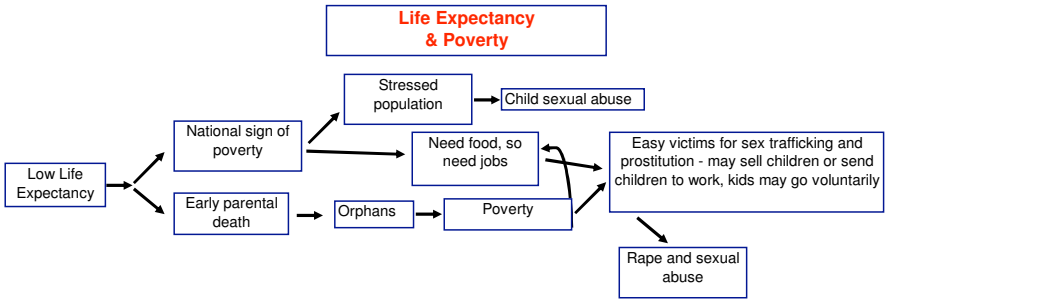
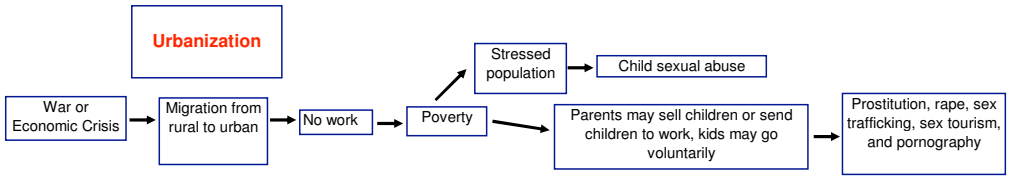
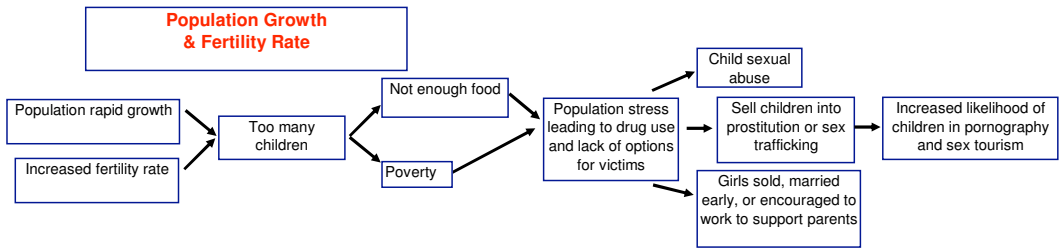
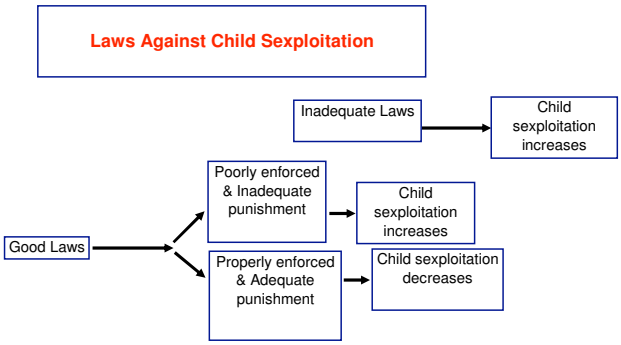
## Appendix A

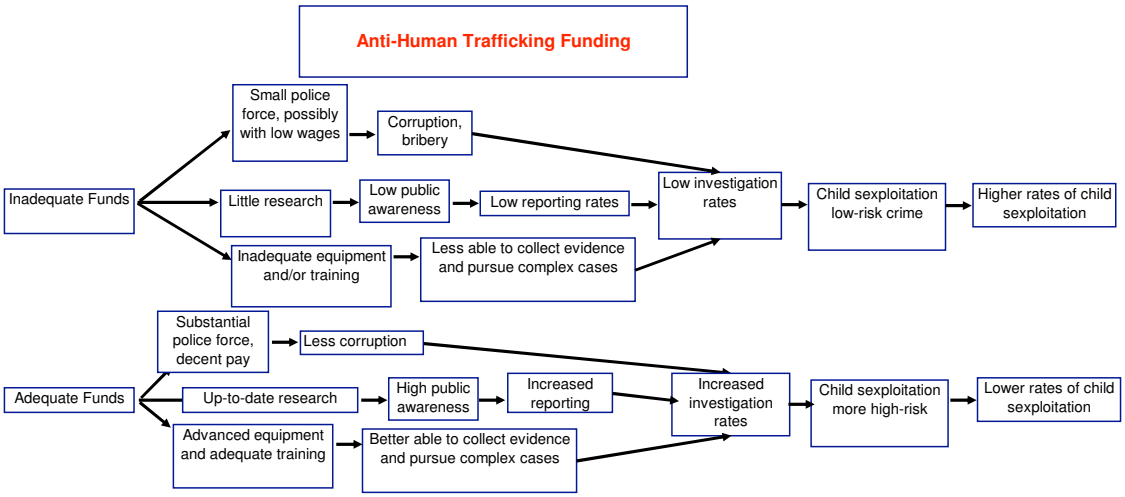

Times of War and Civil Disputes
Refugees
& School Life Expectancy
Disrupted Education or low school life expectancy
Refugees and Internally Displaced Persons
Job loss
Military
People desperate for work
Easy victims for sex trafficking and prostitution - may sell children or send children to work, kids may go voluntarily
Stressed population
Rape and sexual abuse
Demand for prostitutes
Sex trafficking to bring in prostitutes to satisfy demand
Rape and sexual abuse
Infant Mortality Rates
Under Five Mortality Rates
More boy than girl children
& GDP
Stressed population; adult drug and alcohol use
Child sexual abuse
Sell children into prostitution or sex trafficking
Increased likelihood of children in pornography and sex tourism
Lower GDP
Poverty
Higher infant mortality and under five mortality
High rates of girl child infanticide and "accidental" death; malnutrition and disease
Girls sold, married early, or encouraged to work (possibly as prostitutes) to support parents
Patriarchial society
Low status/rights for women
Girls viewed as a financial burden
High GDP
High GDP
More computers & more people online
More children sexually solicited online
HIV/AIDS - circular effect
Stressed population
Child sexual abuse
Infected parents spread HIV to the children they abuse
Need food, so need jobs
Easy victims for sex trafficking and prostitution - may sell children or send children to work, kids may go voluntarily
HIV/AIDS
Job loss
Poverty
HIV/AIDS
Poverty
Death
Orphans
Prostitutes get and spread HIV/AIDS
Rape and sexual abuse
Infected customers spread HIV to the children they abuse
Demand for younger prostitutes theory too young to have HIV & myth of 'cure'


Life Expectancy & Poverty
Low Life Expectancy
National sign of poverty
Early parental death
Stressed population
Child sexual abuse
Need food, so need jobs
Orphans
Poverty
Easy victims for sex trafficking and prostitution - may sell children or send children to work, kids may go voluntarily
Rape and sexual abuse


Urbanization
War or Economic Crisis
Migration from rural to urban
No work
Poverty
Stressed population
Child sexual abuse
Parents may sell children or send children to work, kids may go voluntarily
Prostitution, rape, sex trafficking, sex tourism, and pornography


Population Growth & Fertility Rate
Population rapid growth
Increased fertility rate
Too many children
Not enough food
Poverty
Population stress leading to drug use and lack of options for victims
Child sexual abuse
Sell children into prostitution or sex trafficking
Increased likelihood of children in pornography and sex tourism
Girls sold, married early, or encouraged to work to support parents


Laws Against Child Sexploitation
Inadequate Laws
Child sexploitation increases
Good Laws
Poorly enforced & Inadequate punishment
Child sexploitation increases
Properly enforced & Adequate punishment
Child sexploitation decreases


Anti-Human Trafficking Funding
Inadequate Funds
Small police force, possibly with low wages
Corruption, bribery
Little research
Low public awareness
Low reporting rates
Inadequate equipment and/or training
Less able to collect evidence and pursue complex cases
Low investigation rates
Child sexploitation low-risk crime
Higher rates of child sexploitation
Adequate Funds
Substantial police force, decent pay
Less corruption
Up-to-date research
High public awareness
Increased reporting
Advanced equipment and adequate training
Better able to collect evidence and pursue complex cases
Increased investigation rates
Child sexploitation more high-risk
Lower rates of child sexploitation

## Appendix B
## Definitions of Hypothesis Terms

1) Infant Mortality Rate (IMR) and IMR separated by boys and girls: "This entry gives the number of deaths of infants under one year old in a given year per 1,000 live births in the same year; included is the total death rate, and deaths by sex, *male* and *female*. This rate is often used as an indicator of the level of health in a country" ("Infant mortality rate", 2009, https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html?countryName=United States&countryCode=US&regionCode=na#I).
2) Under-5 Mortality Rate (U5MR) and U5MR separated by boys and girls: "Probability of dying between birth and exactly five years of age expressed per 1,000 live births" ("Under-5 Mortality Rate", 2009, http://www.unicef.org/infobycountry/stats_popup1.html).
3) Number of People Living with HIV/AIDS: "This entry gives an estimate of all people (adults and children) alive at yearend with HIV infection, whether or not they have developed symptoms of AIDS" ("HIV/AIDS – people living with HIV/AIDS", 2009).
4) Population: "This entry gives an estimate from the US Bureau of the Census based on statistics from population censuses, vital statistics registration systems, or sample surveys pertaining to the recent past and on assumptions about future trends. The total population presents one overall measure of the potential impact of the country on the world and within its region. Note: Starting with the 1993 *Factbook*, demographic estimates for some countries (mostly African) have explicitly taken into account the effects of the growing impact of the HIV/AIDS epidemic. These countries are currently: The Bahamas, Benin, Botswana, Brazil, Burkina Faso, Burma, Burundi, Cambodia, Cameroon, Central African Republic, Democratic Republic of the Congo, Republic of the Congo, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Guyana, Haiti, Honduras, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Swaziland, Tanzania, Thailand, Togo, Uganda, Zambia, and Zimbabwe" ("Population", 2009).
5) Gross Domestic Product (GDP purchasing power parity): "This entry gives the gross domestic product (GDP) or value of all final goods and services produced within a nation in a given year. A nation's GDP at purchasing power parity (PPP) exchange rates is the sum value of all goods and services produced in the country valued at prices prevailing in the United States. This is the measure most economists prefer when looking at per-capita welfare and when comparing living conditions or use of resources across countries. The measure is difficult to compute, as a US dollar value has to be assigned to all goods and services in the country regardless of whether these goods and services have a direct equivalent in the United States (for example, the value of an ox-cart or non-US military equipment); as a result, PPP estimates for some countries are based on a small and sometimes different set of goods and services. In addition, many countries do not formally participate in the World Bank's PPP project that calculates these measures, so the resulting GDP estimates for these countries may lack precision. For many developing countries, PPP-based GDP measures are multiples of the official exchange rate (OER) measure. The differences between the OER- and PPP-

denominated GDP values for most of the wealthy industrialized countries are generally much smaller" ("GDP (purchasing power parity)", 2009).

6) Life Expectancy at Birth: "This entry contains the average number of years to be lived by a group of people born in the same year, if mortality at each age remains constant in the future. The entry includes *total population* as well as the *male* and *female* components. Life expectancy at birth is also a measure of overall quality of life in a country and summarizes the mortality at all ages. It can also be thought of as indicating the potential return on investment in human capital and is necessary for the calculation of various actuarial measures" ("Life expectancy at birth", 2009).
7) Total Fertility Rate: This entry gives a figure for the average number of children that would be born per woman if all women lived to the end of their childbearing years and bore children according to a given fertility rate at each age. The total fertility rate (TFR) is a more direct measure of the level of fertility than the crude birth rate, since it refers to births per woman. This indicator shows the potential for population change in the country. A rate of two children per woman is considered the replacement rate for a population, resulting in relative stability in terms of total numbers. Rates above two children indicate populations growing in size and whose median age is declining. Higher rates may also indicate difficulties for families, in some situations, to feed and educate their children and for women to enter the labor force. Rates below two children indicate populations decreasing in size and growing older. Global fertility rates are in general decline and this trend is most pronounced in industrialized countries, especially Western Europe, where populations are projected to decline dramatically over the next 50 years" ("Total fertility rate", 2009).
8) School Life Expectancy (primary to tertiary education), and School Life Expectancy by boys and girls: "School life expectancy (SLE) is the total number of years of schooling (primary to tertiary) that a child can expect to receive, assuming that the probability of his or her being enrolled in school at any particular future age is equal to the current enrollment ratio at that age. Caution must be maintained when utilizing this indicator in international comparisons. For example, a year or grade completed in one country is not necessarily the same in terms of educational content or quality as a year or grade completed in another country. SLE represents the expected number of years of schooling that will be completed, including years spent repeating one or more grades" ("School life expectancy (primary to tertiary education", 2009).
9) Urbanization: "This entry provides two measures of the degree of urbanization of a population. The first, *urban population*, describes the percentage of the total population living in urban areas, as defined by the country. The second, *rate of urbanization*, describes the projected average rate of change of the size of the urban population over the given period of time. Additionally, the World entry includes a list of the *ten largest urban agglomerations*. An *urban agglomeration* is defined as comprising the city or town proper and also the suburban fringe or thickly settled territory lying outside of, but adjacent to, the boundaries of the city" ("Urbanization", 2009).
10) Police Anti-Human Trafficking Unit Funding: The amount of money expended per year by any given country's police anti-human trafficking unit or equivalent organization.
11) Number of Internet Users: "This entry gives the number of users within a country that access the Internet. Statistics vary from country to country and may include users

who access the Internet at least several times a week to those who access it only once within a period of several months" ("Internet users", 2009).

12) Refugees and Internally Displaced Persons: "This entry includes those persons residing in a country as *refugees* or internally displaced persons (*IDPs*). The definition of a refugee according to a United Nations Convention is "a person who is outside his/her country of nationality or habitual residence; has a well-founded fear of persecution because of his/her race, religion, nationality, membership in a particular social group or political opinion; and is unable or unwilling to avail himself/herself of the protection of that country, or to return there, for fear of persecution." The UN established the Office of the UN High Commissioner for Refugees (UNHCR) in 1950 to handle refugee matters worldwide. The UN Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) has a different operational definition for a Palestinian refugee: "a person whose normal place of residence was Palestine during the period 1 June 1946 to 15 May 1948 and who lost both home and means of livelihood as a result of the 1948 conflict." However, UNHCR also assists some 400,000 Palestinian refugees not covered under the UNRWA definition. The term "internally displaced person" is not specifically covered in the UN Convention; it is used to describe people who have fled their homes for reasons similar to refugees, but who remain within their own national territory and are subject to the laws of that state" ("Refugees and internally displaced persons", 2009).
13) Anti-Human Trafficking Government Expenditures – Percent GDP: The percentage of the annual GDP reserved for anti-human trafficking measures, policy, enforcement, and prevention.

## Appendix C
## Structural Factor Coding

Some structural factors, collected through content analysis, are coded in order to be graphed quantitatively:

1) War/Civil Conflict – coded 1) yes and 2) no for every year examined.
2) Laws prohibiting each child sexploitation category – coded from zero to five:
   a. Lack of any real laws or punishments
   b. Poor quality of laws or punishments
   c. "Good" laws and punishments, but poorly enforced because the government has no real interest in enforcing them
   d. "Good" laws and punishments, but poorly enforced. However, poor implementation may be out of the government's control (lack of funding, etc.)
   e. "Good" laws and punishments; significant government efforts to enforce
   f. "Good" laws and punishments; well-implemented and enforced by the government
3) Women's Rights/Status – coded from zero to six:
   a. No rights; treated like chattel/objects subordinate to men in all things; women's earnings in comparison to men is less than a 3 to 10 ratio.
   b. Few rights; treated like chattel/objects, literacy rate is 1/3 that of men; women's earnings in comparison to men is less than a 3 to 10 ratio.
   c. Few rights; inferior to men; lower literacy rate than men; women's earnings in comparison to men is at least a 3 to 10 ratio.
   d. Some rights but generally considered inferior to men; literacy rate is nearly equivalent to men; women's earnings in comparison to men is at least a 3 to 10 ratio.
   e. Some rights, may be considered inferior to men; literacy rate is nearly equivalent to men; women's earnings in comparison to men is at least a 4 to 10 ratio.
   f. Full legal rights, may be treated inferior to men in practice, literacy rate is nearly equivalent to men; women's earnings in comparison to men is at least a 4.9 to 10 ratio.
   g. Full legal rights and complete or near-complete equality in practice (not just in law); literacy rate is equivalent to men; women's earnings in comparison to men is at least a 5.1 to 10 ratio

Each country's code ranking would be accompanied by supporting rationale for its categorization. For example, the United States is currently a code 5 or 6 in the Women's Rights/Status category because although gender disparities and domestic violence still exist, women experience near-equality in work, are generally accepted as equal to men, and the vast majority of American women are literate.