

McNair Research Review

Volume IV

Summer 2006

Ronald E. McNair
Postbaccalaureate Achievement Program

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Volume IV

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The Ronald E. McNair Postbaccalaureate Achievement Program at Middle Tennessee State University is a federal TRiO program that is funded by the U.S. Department of Education under a \$226,105 annual TRiO grant.



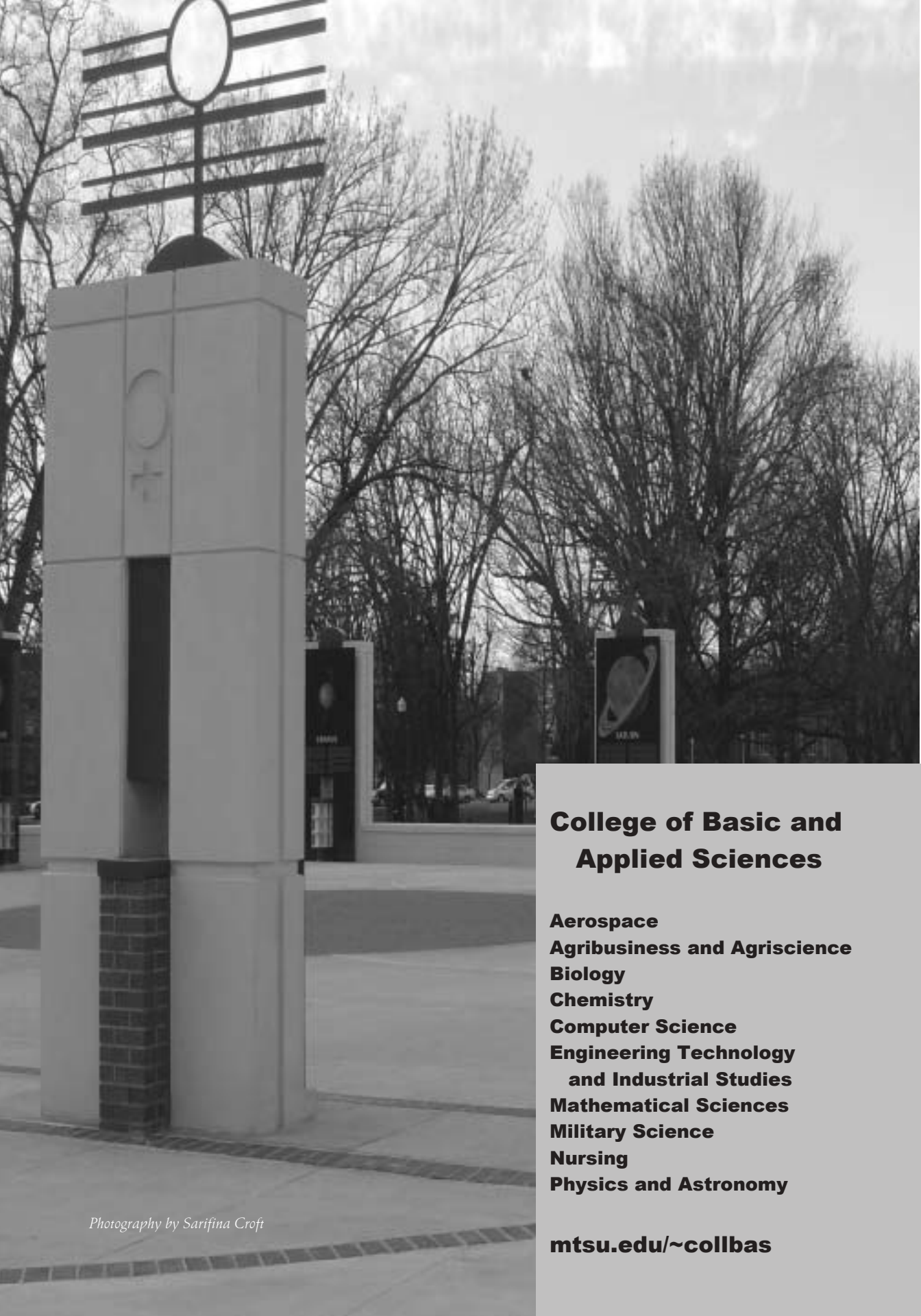
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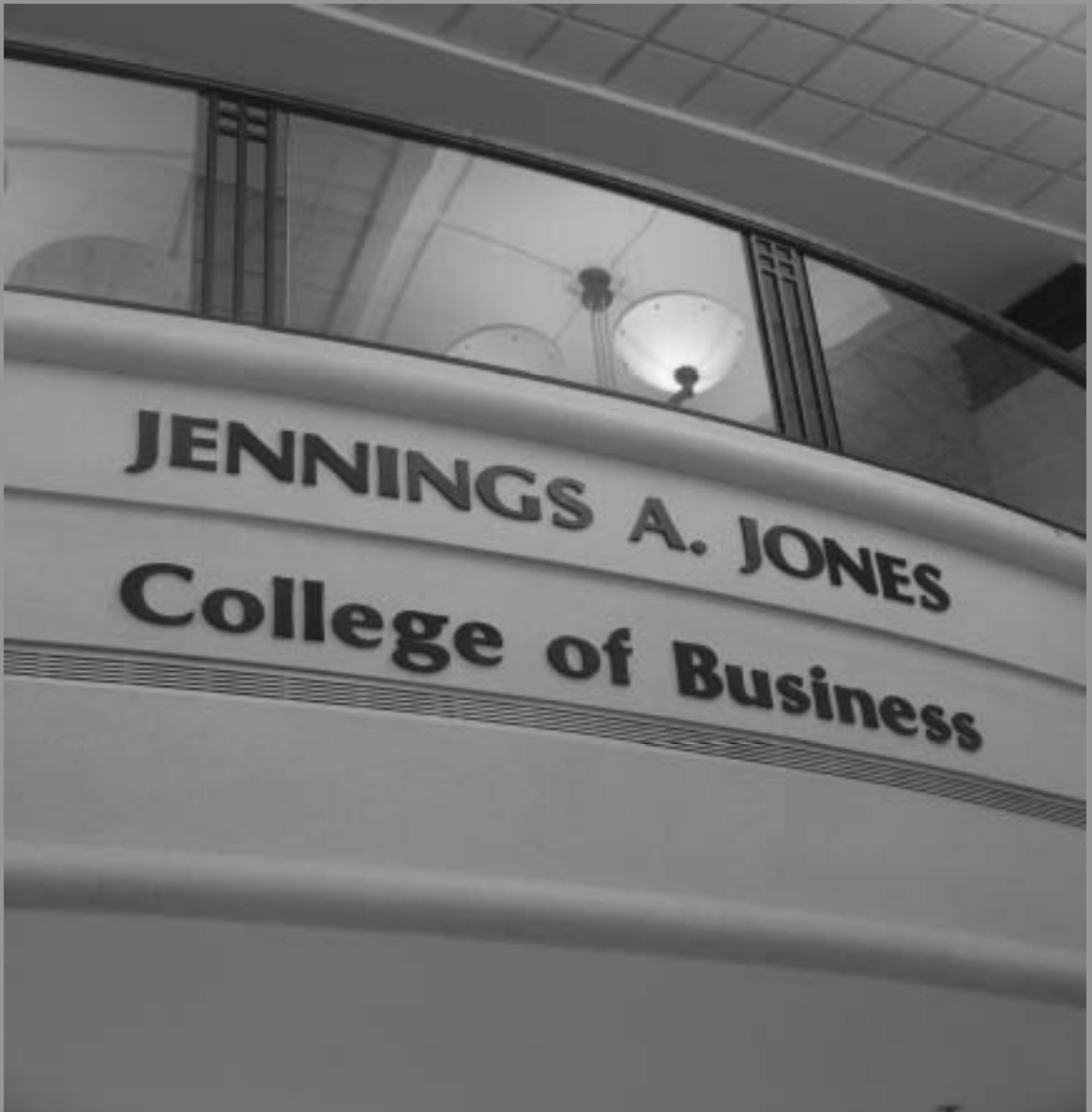
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From the Director

How do you like the new look? This is the fourth volume of MTSU's *McNair Research Review* and the staff decided to do something different. My thanks to Steve Saunders for his creative ideas in designing the new look. His expertise and past experiences as an editor are reflected in this volume. He has set a high standard for himself and future volumes of the journal. Steve completed his first year as the full-time program coordinator May 9, 2006. I'm delighted to have him as a member of the McNair Management Team and look forward to his continued contributions to MTSU's McNair Program.



Another change in this volume of the journal is the visibility and recognition of sponsors whose monetary support paid for its publication. The McNair Program has many friends on campus who contribute to the program's success. In this volume a special "thank you" is extended to the journal sponsors listed on page 4.

The contents of this volume reflect the participation of students from every college on campus. I congratulate them for a job well done and thank the dedicated faculty mentors who supervised and guided the high-quality research projects reported in this journal. The McNair Program is nearing the completion of its seventh year at MTSU. During this time, 45 McNair scholars have earned a baccalaureate degree, 15 a master's degree and 10 are either enrolled or have been accepted in a doctoral program.

The results of a recent study comparing McNair scholars with a control group of MTSU students showed that McNair scholars graduate at the rate of 77 percent, compared to 63 percent of students in the control group. Additionally, McNair scholars obtain a master's degree at nearly three times the rate of similarly qualified non-McNair students and enroll in doctoral programs at more than five times the rate of students in the control group. Control group students had similar qualifications to McNair scholars in that they were first-generation/low-income or from a population under-represented in higher education, had a 3.0 or better CUM GPA, and had completed 60 credit hours or more.

Another "new look" for the program is its web page. Please take a few minutes to read more about the program and the accomplishments of its students at www.mtsu.edu/~mcnair. If you are an MTSU student and meet the qualifications outlined in the preceding paragraph, please consider applying for admission into the McNair Program. Information about the process and an application are online at the web address given above.

The Ronald E. McNair Postbaccalaureate Achievement Program is funded by the U.S. Department of Education. For the university community, I extend a special "thank you" to the DOE for its continued support of MTSU's McNair Program. Partial support of the program is also provided by the Division of Academic Affairs led by Provost Kaylene Gebert. Dr. Gebert asked me to accept the responsibilities of Director for the McNair Program in July 2003. I appreciate her vote of confidence in me and her continued support of the program.

This publication is a product of the efforts of many people. The students, their faculty mentors, Steve Saunders, program coordinator, Dr. Mary Enderson, academic coordinator, who read all of the papers and offered suggestions, and Ms. Cindy Howell, the program's administrative assistant, who keeps us all on task. The journal is produced and printed by Publications and Graphics and by Printing Services at Middle Tennessee State University. My sincere appreciation goes to everyone who contributed to Volume IV of the *McNair Research Review*.

Sincerely,

L. Diane Miller

L. Diane Miller
Director, MTSU McNair Program



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About McNair Scholars and Program

The following information was taken from www.ed.gov/offices/OPE/HEP/trio/triohistory.html

History of the Federal TRiO Programs

The history of TRiO is progressive. It began with Upward Bound, which emerged out of the Economic Opportunity Act of 1964 in response to the administration's War on Poverty. In 1965, Talent Search, the second outreach program, was created as part of the Higher Education Act. In 1968, Student Support Services, which was originally known as Special Services for Disadvantaged Students, was authorized by the Higher Education Amendments and became the third in a series of educational opportunity programs. By the late 1960s, the term "TRiO" was coined to describe these federal programs.

Over the years, the TRiO Programs have been expanded and improved to provide a wider range of services and to reach more students who need assistance. The Higher Education Amendments of 1972 added the fourth program to the TRiO group by authorizing the Educational Opportunity Centers. The 1976 Education Amendments authorized the Training Program for Federal TRiO Programs, initially known as the Training Program for Special Programs Staff and Leadership Personnel. Amendments in 1986 added the sixth program, the Ronald E. McNair Postbaccalaureate Achievement Program. Additionally, in 1990, the Department created the Upward Bound Math/Science program to address the need for specific instruction in the fields of math and science. The Upward Bound Math/Science program is administered under the same regulations as the regular Upward Bound program, but it must be applied for separately. The Higher Education Amendments of 1998 authorized the TRiO Dissemination Partnership program to encourage the replication of successful practices of TRiO programs. Finally, the Omnibus Consolidated Appropriations Act of 2001 amended the Student Support Services (SSS) program to permit the use of program funds for direct financial assistance (Grant Aid) for current SSS participants who are receiving Federal Pell Grants.

The legislative requirements for all Federal TRiO Programs can be found in the Higher Education Act of 1965, Title IV, Part A, Subpart 2.

Ronald E. McNair, Ph.D.

Born October 21, 1950, in Lake City, South Carolina, Ronald McNair achieved early success as both a student and an athlete at Carver High School, Lake City, South Carolina. He graduated in 1967 as valedictorian of his high school class. Afterwards, he attended North Carolina A&T State University where he graduated magna cum laude in 1971 earning a B.S. degree in physics. He went on to earn a doctor of philosophy in physics from Massachusetts Institute of Technology (MIT) in 1976, where he specialized in quantum electronics and laser technology. As a student, he performed some of the earliest work on chemical HF/DF and high-pressure CO lasers, publishing path-breaking scientific papers on the subject.

After completing his Ph.D., he began working as a physicist at the Optical Physics Department of Hughes Research Laboratories in Malibu, California, and conducted research on electro-optic laser modulation for satellite-to-satellite space communications.



In January 1978, NASA selected him to enter the astronaut cadre, making him one of the first three Black Americans selected. Dr. McNair died on January 28, 1986, when the Space Shuttle Challenger exploded after launch from the Kennedy Space Center.

MTSU McNair Scholars Program

Middle Tennessee State University Ronald E. McNair Postbaccalaureate Achievement Program is designed to serve first-generation and low-income students as well as students from groups underrepresented in doctoral level studies. Our program encourages talented students to pursue a doctoral degree by providing participants with a mentored research experience, study groups for crucial areas of discipline, and seminars and workshops on topics germane to the pursuit of graduate education. Participants gain experience in presenting their research at professional conferences where they have the opportunity to meet others in their discipline and exchange ideas. Participants attend graduate school fairs and visit university campuses to gain information on the possibilities for future attendance in graduate school.

The MTSU McNair Program comprises academic year and summer research programs. Participants are required to complete a series of assignments and research that prepares them to be choice candidates for graduate schools. The MTSU McNair Scholars Program is funded through a grant from the U.S. Department of Education under the Higher Education Act of 1965, Title IV, Part A, Subpart 2 and Middle Tennessee State University.

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a dream come true, you
must first have one."*

Ronald E. McNair



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Language Discrimination: Grammar as a Means of Social Stratification

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Dr. Allison Smith

Department of English

Abstract

Even in a democratic nation, a nation that promises freedom, equality, and opportunity for all citizens, linguistic social stratification is common. Many people are sensitive to physical discrimination but do not think about language discrimination, making character judgments based on how something is stated rather than what is stated. Media such as television, film, music, magazines, and newspapers perpetuate such discrimination by exaggerating language stereotypes. Members of the upper-class are usually depicted as speakers of Standard English, while the poor and uneducated are often depicted as speakers of dialects such as Southern, Brooklyn, African American, and Hispanic. Beyond the media, speakers of nonstandard dialects are denied access to the best schools and highest-paying jobs. The goal of this study is to examine how grammar is used to delineate between class, race, and area of birth and to advance awareness of the value of all forms of English.

Prescriptive and Descriptive Grammar

The debate over grammar and social stratification is centered around two main perspectives: prescriptive and descriptive, both of which seek to explain why we should or should not use grammar as a means of social stratification. In general, prescriptive grammarians support language discrimination by rejecting nonstandard dialects in favor of a standard, and descriptive grammarians support language equality by treating all dialects as equally valuable. Examining both perspectives reveals the deep disagreement between the prescriptive approach of traditional grammar and the descriptive approach of modern linguistics.

Traditional grammar is generally prescriptive in nature and is most often found in style manuals. Many of the rules found in traditional grammar were created in the seventeenth and eighteenth centuries, when British “scholars became preoccupied with the art, ideas, and language of ancient Greece and Rome [and] the classical period was regarded as a golden age” (Cipollone, Keiser, and Vasishth 13). These scholars used the grammar rules of Latin to create grammar rules for English, even when such rules contradicted actual English usage. In the same time period, “anyone who desired education and self-improvement and who wanted to distinguish himself as cultivated had to master the best version of English” (Pinker 373), which was thought to be the same form of language used by upper-class London scholars. Since those who sought social advancement did not know the prestige dialect, there was a sudden “demand for handbooks and style manuals,” and “as the competition became cutthroat, the manuals tried to outdo one another by including greater numbers of increasingly fastidious rules that no refined person could afford to ignore” (373).

From this trend came the idea that Standard English rules, created from “superior” Latin, define the purest form of English. In actuality, these rules helped to define social class. The idea developed that non-standard dialects were incorrect and corrupt. In 1710, Jonathan Swift wrote that “[t]here are some Abuses among us of great Consequence . . . These are, the deplorable Ignorance that for some Years hath reigned among our English Writers, the great depravity of our Taste, and the continual Corruption of our Style” (qtd. in Freeborn 377). Later writers and grammarians, such as Robert Lowth and Noah Webster, continued the idea that their versions of standard English were superior to other forms. Many of our current prescriptive rules descended from the often arbitrary distinctions created during this time. For instance, it was Lowth who decided that “you must say *different from* rather than *different to* or *different than*” and that “*between* can apply only to two things and *among* to more than two” (Bryson 577).

In contrast, descriptive grammarians seek to define how a language is actually used. Descriptive grammar “does not tell you how you should speak; it describes your basic linguistic knowledge” (Fromkin, Rodman, and Hyams 14). In this approach, no language or dialect is considered superior to another because any form of communication is considered valuable if it effectively conveys information. Rather than a sign of language degeneration, dialects are an example of natural language change and intrinsic language variation (Lippi-Green 10). Most linguists support the view that “standard” English is a created dialect that is not a natural form of the language, since no English speakers consistently and completely follow Standard English rules. Nicholas Sobin contends “that prestige language may not be the ‘pure’ form of the language that it is so often assumed to be, but rather a form of language that can only be produced with a considerable amount of ‘abnormal’ tinkering and adjustment” (23).

Many descriptive linguists are attempting to dispel prescriptive myths with some success. Dennis Baron’s *Guide to Home Language Repair* “does its best to explode the concerns of [usage guides], to get behind, beyond, or beneath them” and is written with the assertion that “your language probably doesn’t need repair in the first place” (1). Steven Pinker contends that “[m]ost of the prescriptive rules of the language mavens make no sense on any level . . . [and] conform neither to logic nor to tradition” (373). According to Bill Bryson, “[c]onsiderations of what makes for good English or bad English are to an uncomfortably large extent matters of prejudice and conditioning” (578). These linguists, among many others, challenge prescriptive rules such as not ending sentences with prepositions, not using double negatives, and not splitting infinitives. For example, the popular culture sentence that includes “to boldly go where no man has gone before” would not be acceptable to prescriptive grammarians due to the split infinitive “to boldly go” and the use of the preposition “before” at the end of the sentence.

Grammar and Social Class

When descriptive grammarians challenge prescriptive rules, they are often challenging language discrimination. Pinker recognizes that, “since prescriptive rules are so psychologically unnatural that only those with access to the right schooling can abide by them, they serve as shibboleths, differentiating the elite from the rabble” (374). This is not a new idea in the field of linguistics. In 1966, while President of the American Dialect Society, Raven McDavid attested that “the surest social markers in American English are grammatical forms” (63).

Correct English is an arbitrary distinction based on popular perceptions of a social class, ethnic group, or region. One important aspect of this perception is accent, the way in which words are pronounced. Regardless of the grammaticality of a phrase, speakers of lower social classes are often identified and judged by their accent. Speakers of higher social classes do not consider themselves to speak with an accent (Lippi-Green 58). Grammatical ability and accent

become intertwined, so that unacceptable accents are identified with poor grammar usage and prestige accents are identified with proper grammar usage, even when this is not actually the case. So while “[a] native of Mississippi or Brooklyn may have exactly the same educational background, intelligence, and point to make as their counterparts in Ohio and Colorado . . . they do so with an accent” (58). One of the main reasons why many companies and even universities reject candidates with strong “unfavorable” accents is the desire to avoid being associated with such perceptions. A Southern foreign-language professor interviewing for a position at a Northeast university was first laughed at, then asked several times whether she would “be comfortable” at this university (Lippi-Green 210). Workers report attending “accent reduction” courses (212), sometimes voluntarily but often not.

Some people may contend that the availability of public education allows speakers of nonstandard dialects to learn Standard English if they wish to change their social class. While this may sometimes be true, such an attitude rejects the often insurmountable obstacles to doing so. One such obstacle may exist in Standard English itself. According to Sobin, “prestige constructions represent unnecessary complexity in the operative grammar that may, in fact, be the basis of their perceived prestige” (33). It follows that the difficult constructions of Standard English require much schooling to learn, yet Labov states that “[e]ven the successful middle-class student does not always master the teacher’s grammatical forms, and in the urban ghettos we find very little adjustment to school forms” (313). This may be caused in part by inequality in education, shown vividly in Jonathan Kozol’s *Savage Inequalities*. Few middle-class Americans realize that poor students in East St. Louis attend a school which regularly overflows with sewage (23), that “on an average morning in Chicago, 5,700 children in 190 classrooms come to school to find they have no teacher” (52), or that in New York, “the poorest districts in the city get approximately 90 cents per pupil, while the richest districts have been given \$14 for each pupil” (98). One high school student in New York reports that he went two months one fall without an English textbook and was later unable to identify a verb in a simple sentence (111). In such situations, it is hard to believe that equal opportunities to learn a standard dialect exist, but the myth of educational opportunity is perpetuated by those who are unaware of the facts.

Grammar and Race

Kozol also notes that the inequality is not just one of social class. In the examples listed above, over 90 percent of the student populations were black, with the remaining 10 percent either Asian, Hispanic, Middle Eastern, or occasionally white. The schools in nearby, well-funded, districts are predominately white, sometimes as much as 98 percent (35, 66, 87). This disproportion in educational resources reveals a deeper problem. Innumerable non-white children receive a level of education that would be considered unacceptable to most white families in America. Far from being unwilling to learn, these children begin school under the same impression that white children do: if they try hard, they can succeed. Yet in one promising kindergarten classroom in Chicago, Kozol notes that “[t]welve years from now, by junior year of high school . . . 14 of these 23 boys and girls will have dropped out of school . . . [and] Eighteen years from now, one of those . . . may graduate from college, but three of the 12 boys in this kindergarten will already have spent time in prison” (45).

In schools that are barely able to teach anything, it should come as no surprise that most students fail to learn an artificially complicated prestige dialect that even middle-class white children in well-funded schools are unable to master. Speakers of African American Vernacular English (AAVE) or of English as a Second Language (ESL) are in effect uneducated, not because of a lack of intelligence, but because of a lack of resources. Since the majority of middle-class

white families are unaware of the educational divide, they assume that the nonstandard English speakers are unintelligent. This opinion is often transferred to the nonstandard dialect spoken by lower-class groups. AAVE, in particular, is generally considered by speakers of Standard English to be “a badly spoken version of their language, marred by a lot of ignorant mistakes in grammar and pronunciation” (Pullum 40), yet linguists such as Geoffrey Pullum, Rebecca Wheeler, Walt Wolfram, and Geneva Smitherman have found AAVE to be logical, grammatical, and sometimes even more effective than Standard English. One of the more ridiculed aspects of AAVE is the use of “be,” a feature that has been found to be more concise and accurate than its Standard English counterpart. For example, sentences using “be” represent a future, recurring, or habitual action (Smitherman 331). A speaker of AAVE can say “He be tired after work,” but a speaker of Standard English must say “He is tired every day after work.” The AAVE sentence requires fewer words but conveys the same meaning.

For speakers of ESL, there is a pressure to learn English at the expense of their native tongue. Richard Rodriguez matter-of-factly states that “[e]veryone remembers going to that grammar school where students were slapped for speaking Spanish” (479). He remembers the psychological difficulty of learning English, the “pain and guilt and fear” of giving up “symbols of home” for “the language of the bus driver and Papa’s employer” (481). Others remember more than mild physical and psychological punishment. One informant quoted by Patricia MacGregor-Mendoza recalls that “if they spoke in Spanish the teacher would trim the finger nails of a hand down low, almost making them bleed, and if that wasn’t enough the teacher would hit the students with a ruler right on the tips of these fingers” (86). However, conformity has its own cost. Another informant reports giving an anglicized name, Betty, instead of the Spanish Carlota, when asked what his mother’s name was (86). Children often erase “even the smallest indication of [their] Spanish-speaking heritage in order to save face and get along in school, an attitude which often continues through adulthood (87). Sadly, these same issues are faced by children of all foreign backgrounds, leaving them disconnected with their original culture.

Grammar and Regional Dialect

Surprisingly, children raised in an unfavorable dialectal region may face the same difficulties with communication and cultural disconnection if they choose to speak Standard English. As a child raised in the South, I came to understand that my home dialect would be an impediment to future success and resolved to change my speech patterns. Unaware of code-switching, the process of choosing appropriate dialectal forms for appropriate situations, I rejected my regional dialect in favor of Standard English by shifting pronunciation, using different vocabulary, and eliminating stereotypical phrases. I did not anticipate the difficulties this change would bring. I did not anticipate being labeled “snobby” by my peers or having difficulty communicating with my parents. My father frequently asks me to slow down, not because Southern speech is actually slower but because I use a different grammar and pronunciation systems. (According to McDavid, “though it is a favorite sport among Northerners to attribute the so-called ‘Southern drawl’ to laziness induced by a hot climate, Southerners speak with a more rapid tempo than most Middle Westerners” (60).) Because I did not learn code-switching, I cannot speak in the regional dialect without sounding fake and condescending.

Rosina Lippi-Green cites a study performed by Dennis Preston in which “seventy-six young white natives of southern Indiana . . . rank[ed] all fifty states as well as New York City and Washington DC in terms of ‘correct English’” (56). Not surprisingly, “these informants found the most correct English in five areas: North Central . . . Mid-Atlantic (excluding New York City); New England; Colorado; and the West Coast” (57), with most Mid-Western states ranking

close behind. The students perceived a lack of correct English fairly consistently in the South, with Arkansas, Texas, and New Mexico only marginally higher (57). Similar perceptions were found by P. Gould and R. White in a study of the “environmental preferences” of students at the University of Minnesota, who felt that the same five areas—North Central, Mid-Atlantic, New England, Colorado, and the West Coast—were the best places to live, with the South being the worst place to live (qtd. in Lippi-Green 203). Of course, the perception of a region is arbitrary. Another study performed by Gould and White at the University of Alabama found opposite results. These students found the South to be the most favorable place to live, with the North being the least favorable (qtd. in Lippi-Green 204).

Despite the popular belief that Southern is incorrect and uneducated English, grammatical patterns can be found. For example, double negatives, which are a common feature in Southern English, were standard in English until Robert Lowth arbitrarily decided that two negatives make a positive and published this opinion in his 1762 book, *A Short Introduction to English Grammar* (Bryson 577). In fact, “far from being a corruption, [the double negative] was the norm in Chaucer’s Middle English” (Pinker 376), and Chaucer is an author still often taught in school. It is even required in other languages to use more than one negative indicator. In French, speakers must surround the verb with *ne...pas* for *not*, *ne...rien* for *nothing*, and *ne...jamais* for *never*. Consider that “[n]o one would dream of saying *I can’t get no satisfaction* out of the blue to boast that he easily attains contentment” (377). This arbitrary rule continues to be prescribed even though most dialects of English, not just Southern, break it.

Conclusion

Many people consider “physical” discrimination, based on characteristics such as race or gender, unacceptable but commit linguistic discrimination without thought. Equal Opportunity forbids employers from discriminating based on race, religion, gender, or disability, but there is no mention of language. Employers continue to reject applicants who use unacceptable dialects or to send employees to “language coaching” classes. What would happen if an employer proposed sending black employees to “white coaching” classes or a Jew to a class on Christianity? The public outrage, media attention, and lawsuits would likely be intense.

One wonders about the children in Kozol’s book, children who did not have the advantage of attending a middle-class school. What potential is dying with the dreams of these children? What innovations have gone undiscovered? What philosophies are stifled because the speakers are dismissed before they can say a word? These are questions that should never have to be asked in America but should be addressed right now.

Acknowledgments

I would like to thank the McNair Scholars Program for the opportunity to do this research. I would also like to thank Dr. Allison Smith for the endless hours of invaluable help she provided, even in illness; Dr. Trixie Smith for stepping in and helping me on such short notice; the students of the research study group – Dianna, Stacia, Vickie, Emilee, and Abby – for keeping me steady and giving me constant valuable advice; and my fiancé, who prompted this research by asking, “Why did we have to learn grammar in school, anyway?” and then supported me while I sought the answer.

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Playing Responsibly: Social Responsibility in Professional Sports Organizations

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Abstract

In this research, social responsibility is defined and its importance is explained. Also, sixteen professional sports organizations and sixteen Fortune 500 companies were sampled and content analysis was used to determine if professional sports organizations are being socially responsible to uphold the high standards society has placed upon them.

Introduction

“Corporate social responsibility is a commitment to improve community well-being through discretionary business practices and contributions of corporate resources” (Kotler and Lee 2005, p. 3). It is important because it benefits society and businesses at the same time. Social responsibility is a cycle: the community supports businesses and the businesses support the community in return through being socially responsible. Businesses build profits and the community has a more prosperous environment.

While the subject of social responsibility has been discussed extensively for product and service companies, little has been written about the social responsibility practices of professional sports organizations. Society expects professional sports leagues to display social responsibility because they are highly visible in the public eye. This research was conducted to compare social responsibility initiatives of professional sports leagues with those of Fortune 500 companies to identify the extent to which social responsibility exists within professional sports leagues.

Literature Review

For a company to be described as socially responsible its commitment to change the community must be voluntary and initiated by that organization (Kotler and Lee 2005 p. 3). That is, a corporation is not legally bound by law to contribute to society. Another key factor of a socially responsible company is that it is able to meet the needs of society (Arena 2004 p. 59) by being aware of the needs of the community in a constantly changing society. William Clay Ford, Jr., chairman of the board and CEO of Ford Motor Company, says, “There is a difference between a good company and a great company. A good company offers excellent products and services. A great company also offers excellent products and services but also strives to make the world a better place” (Kotler and Lee 2005, p. 6).

Being socially responsible has the potential to benefit both society and the company initiating action in the community. Social responsibility to society can include, but is not limited to, influencing behavior change, providing resources and increasing awareness about a particular cause. Simultaneously, organizations may build brand awareness and modify the

company's reputation, thereby creating an opportunity to increase profits (Kotler and Lee 2005). The ultimate goal of social responsibility is that both the community and the company come out winners.

Corporate social responsibility can come in many forms and under different titles. It can include monetary donations, corporate volunteering, supplying equipment, increasing employment in the community, keeping employees happy, starting foundations, and creating scholarships and grants. Many companies list these activities as community relations. The phrase "community relations" has a parallel meaning to the definition of social responsibility. "Community relations is the organizational function dedicated to building and maintaining relationships and trust with the community" (Thorne, Ferrell and Ferrell 2003, p. 234). The difference between the two is that corporate social responsibility involves commitment to adapting to the needs of the community. Community relations focuses on trust between companies and the community.

Kotler and Lee (2005) divide social responsibility into six categories: cause promotions, cause-related marketing, corporate social marketing, corporate philanthropy, community volunteering, and socially responsible business practices. Although each of these types of social responsibility is distinguishable from the next, many people fail to realize that there are differences between them. It might be helpful, then, to examine each category in more detail.

With a cause promotion, as its name suggests, a corporation provides money to increase awareness and concern for a cause. It is also known as cause sponsorship or cause advertising. Cause promotions differ from the other categories of corporate social responsibility because promotional strategies are emphasized. This calls for involvement in developing and distributing materials and participation in public relations activities. The potential benefits of cause promotions include strengthened brand positioning for the company, brand preference, and increased customer loyalty. The largest benefit of cause promotions is that it can substantially improve the image of a company (Kotler and Lee 2005). For example, if a company with a tainted reputation joins ranks with a well-respected cause, the public is more likely to revise previous negative judgments.

Cause-related marketing is often used interchangeably with corporate social responsibility but is a distinct activity. Kotler and Lee define cause-related marketing as follows: "A corporation commits to making a contribution or donating a percentage of revenues to a specific cause based on product sales. Most commonly this offer is for an announced period of time, for a specific product, and for a specified charity" (2005). Although cause-related marketing campaigns seem like a win for the cause and the company, it can be hard to maintain a successful initiative. Participation has to be extremely high to generate profit and there is a high investment in paid promotions (Kotler and Lee 2005).

Corporate social marketing, another type of social responsibility, is a campaign whereby a corporation supports a behavior change intended to improve the well-being of society. It, too, can build sales, especially when companies are supporting a behavior change that can be implemented with their products. This emphasizes that the core business of the company and the cause match. For example, Crest's oral health campaign for children simultaneously builds awareness about the importance of good oral hygiene in children and offers products to assist in making that happen (Kotler and Lee 2005).

Philanthropy, the most common form of corporate social responsibility, is any act of "benevolence and goodwill, such as making gifts to charities, volunteering for community projects, and taking action to benefit others" (Thorne, Ferrell and Ferrell 2003, p. 358). Forms of philanthropic activities include monetary donations, scholarships and grants, donating products and services, and giving expertise in a specific area. Typical recipients of philanthropy are non-

profit organizations and foundations (Kotler and Lee 2005). By donating money, a company can sometimes be seen as trying to fulfill its social obligation. It is more common, however, for a company to donate its resources; not only is there more involvement, but it is also less costly. An example of this in sports would be players from a professional football team hosting a free football camp for underprivileged children.

Volunteerism is a large part of many corporate social responsibility efforts. Community volunteerism entails a company's employees and/or partners volunteering in the name of the company. Numerous corporations have incorporated employee volunteer programs into their business plans. It is a popular concept because it builds relationships with the community, increases employee motivation, and enhances the company's image. It also provides as an opportunity for the corporation to increase its top-of-the-mind recall among members of the public.

The last category, socially responsible business practices, are those practices that improve community well-being and/or protect the environment (Kotler and Lee 2005). The distinguishing characteristic of socially responsible business practices is that a company acts at its own discretion. Altruism is not the only motivation. Profits can be increased when reputation is the deciding factor for a consumer. According to a national survey by Cone/Roper "70 percent of consumers would be likely to switch to brands associated with a good cause, as long as price and quality were equal" (Thorne, Ferrell and Ferrell 2003, p. 220).

From a business perspective, a sports league is unique compared to other profit-making companies in that it offers not a tangible good or service but rather an experience, a psychological feeling. Its consumers are largely fans. In addition to providing games to keep fans happy, sports leagues can demonstrate that they value their fans and customers through being socially responsible.

By demonstrating social responsibility, a professional sports organization can create a positive image and reputation for itself. It can also build "brand" awareness, reaching untapped consumers and satisfying preexisting ones, which in return can increase profits. Social responsibility in relation to professional sports organizations is known as "sports philanthropy." Sports philanthropy is direct involvement in the improvement of a community or promotion of its well-being (Goddard 2002). An example is the partnership between Amscot Financial and the Tampa Bay Buccaneers, a team in the National Football League. "In September 2004, Amscot Financial pledged to donate \$500 to the Children's Cancer Center each time the Tampa Bay Buccaneers scored a touchdown during the 2004 regular season" (PR Newswire Association 2005). This partnership raised \$18,500.

An obvious reason for a league or a franchise to be socially responsible is to build a positive image and reputation. According to Roy and Graeff (2003) "... activities that demonstrate a concern for social causes or charities not only allows a sports franchise to meet its social responsibilities, but it also reinforces the positive qualities of sports and athletes to audiences who look to them for guidance." However, sports organizations that link themselves to a cause or another company can be taking a risk. ADWEEK (2004) cites Ty Stewart, director of marketing for the National Football League, as follows: "The NFL cherishes its image, not to mention its relationship with its commercial partners. 'We are incredibly selective about the [advertising] categories in which we choose to find partners' Stewart says, suggesting that's a model that benefits both sides of the equation."

Another risk is public cynicism. Sometimes corporate efforts are seen as "doing good to look good" (Kotler and Lee 2005). The motives of the company or sports organization can be questioned and their efforts may be viewed as publicity stunts to cover up corruption (Kotler

and Lee 2005). Still, publicizing socially responsible practices not only lets the world know that a company is doing its part, but as mentioned earlier, can also build brand awareness. Social responsibility can also strengthen the preexisting relationships the company has already established with a particular community. “While charitable efforts may make players and team officials feel good, there is more to community work than just that. As professional sports become more and more of a business, teams and fans have to look harder to form emotional attachments. Team efforts in the community are one way of doing that” (Telljohn 2001). Also, when fans see professional sports organizations, teams or players making a direct impact on issues involving their communities, it makes them feel more valued as a consumer.

Team-supported, cause-related marketing can be used as a sales promotion method to stimulate ticket sales (Roy and Graeff 2003). In a research study conducted on how professional sports team’s social responsibility activities influence consumer purchase decisions, a majority of respondents indicated they would be more likely to buy tickets to the team’s games and team merchandise if they knew the organization supported community charities or causes (Roy and Graeff 2003). Social responsibility initiatives will not necessarily convert a person into a sports fan but being socially responsible could change negative images the public might have about that sports organization (Roy and Graeff 2003). With professional sports organizations having a heavy influence on society, it is possible for them to make a difference while filling stadiums.

Method

Because the main objective of this research is to determine the extent to which sports organizations demonstrate social responsibility, the following research questions were asked:

- (1) What are the social responsibility initiatives of professional sports organizations in terms of the number and nature of initiatives undertaken?
- (2) How do the social responsibility initiatives of professional sports organizations compare to non-sports companies?

The research questions were addressed by collecting data on the social responsibility initiatives of a sample of 16 professional sports organizations and 16 Fortune 500 companies. Selections for both sports organizations and corporations were drawn from a variety of fields, and they are listed in the Appendix. Information about social responsibility initiatives was gathered from the official website of each entity in the sample. Every initiative identified was classified according to its type, beneficiaries, and whether or not the initiative was part of a foundation created by the sports organization or company. (The classification categories of the beneficiaries are children, women, economically disadvantaged, general public, environment, multiple beneficiaries, and men.) A total of 239 initiatives were identified from the 32 sports and corporate organizations sampled. Of those 239 initiatives, 29.7% came from professional sports organizations.

Results

Of the sports leagues nearly 44% of the 71 initiatives were directly related to sports. The National Football League (NFL) had the most initiatives – 21 of 71. Slightly more than 87% of professional sports league initiatives were company-created. Just under 13% of sports initiatives were from an external charity or cause, far below the 56.5% in the corporate world. Nine of the 104 external initiatives were from sports leagues.

Table 1. Type of Social Responsibility Initiatives

Initiative Type	Professional Sports Organizations		Fortune 500 Firms	
	Frequency	Percent	Frequency	Percent
Related to Core Products/ Services	31	43.7	36	21.4
Unrelated to Core Products/ Services	38	53.5	120	71.4
Disaster Relief	2	2.8	12	7.1
Total	71	100.0	168	100.0

Table 2. Source of Social Responsibility Initiatives

Initiative Source	Professional Sports Organizations		Fortune 500 Firms	
	Frequency	Percent	Frequency	Percent
Internal to Organization or Firm	62	87.3	73	43.5
External Initiative	9	12.7	95	56.5
Total	71	100.0	168	100.0

Children accounted for 38% of the sports leagues' entire beneficiary category, nearly double the Fortune 500 percentage rate. Sports leagues created the only initiative that benefited men. While men might be expected to be a prime target for sports organizations, that there was only one initiative aimed at men (out of 71 total for sports) is surprising. Sports and corporate initiatives were much closer for women but sports organizations were twice as likely as Fortune 500 companies to benefit the economically disadvantaged.

On a percentage basis, professional sports organizations and Fortune 500 companies were almost equally likely to create an internal charitable foundation. Sports organizations did so at the rate of 31%, just slightly below that of Fortune 500 companies.

Table 3. Beneficiaries of Social Responsibility Initiatives

Initiative Beneficiary	Professional Sports Organizations		Fortune 500 Firms	
	Frequency	Percent	Frequency	Percent
Children	27	38.0	33	19.6
Women	6	8.5	16	9.5
Men	1	1.4	0	0
Economically Disadvantaged	8	11.3	7	4.2
General Public	4	5.6	17	10.1
Environment	0	0	6	3.6
Multiple Beneficiaries	25	35.2	89	53.0
Total	71	100.0	168	100.0

Table 4. Existence of Internal Charitable Foundations

Internal Charitable Foundation	Professional Sports Organizations		Fortune 500 Firms	
	Frequency	Percent	Frequency	Percent
Yes	22	31.0	55	32.7
No	49	69.0	113	67.3
Total	71	100.0	168	100.0

Non-sports organizations account for 168 initiatives, or 70% of the total of 239. The Xerox Company has 31 initiatives, which is more than any other company. Whirlpool was a close second with 30 initiatives. Of non-sports organization's, 21% of social responsibility initiatives are directly related to the companies' products or services, half the rate of 44% for all of sports leagues' initiatives which are directly related to their products or services.

Non-sports organizations' major beneficiaries fell under the category of "multiple beneficiaries," which had 89 initiatives, but in contrast, children are the primary beneficiaries of sports leagues. None of the initiatives benefiting the environment came from sports leagues.

Discussion

Presently, sports organizations experience the same pressure as non-sports organizations to fulfill expectations of being socially responsible because they get a large amount of public attention and because they have high incomes (or at least those with TV advertising contracts). However, the non-sports organizations in the sample had significantly more initiatives than professional sports organizations. The NFL ranked first in number of initiatives among sports leagues, but fifth out of the entire sample. This suggests that professional sports leagues are showing social responsibility but not to the same extent as non-sports organizations. However,

this conclusion is tentative because the current study does not examine the budgets for the initiatives of either group. It is conceivable that more money could be spent on fewer initiatives by sports organizations.

The vast majority of the efforts of professional sports organizations, 87%, were company created. This reflects a strong emphasis on catering to the needs and interests of the people who support a given sports league. As mentioned earlier, sports leagues place heavy emphasis on children. Most of the initiatives in this category try to get more children involved in a particular sport. Also to be considered, the initiatives were looked at on an organizational level, which captures Fortune 500 activities very well but tends to under-represent sports organizations. Leagues often credit teams or even individual athletes for social responsibility efforts. Six organizations did not list any social responsibility initiatives on their websites; five of these were sports leagues. This does not necessarily mean that the one company and five sports leagues are not showing social responsibility. For example, the Arena Football League (AFL) did not list any initiatives that are supported by the league, but it did list the initiatives of individual teams and players.

There are some interesting comparisons between professional sports organizations and non-sports corporations. For example, 7% of non-sports organizations' initiatives were related to disaster relief, whereas sports leagues had only about 3%. Both of these statistics are fairly low, but all of the initiatives supporting disaster relief from the sports leagues were company created. Nearly all of the non-sports organizations initiatives that were associated with disaster relief benefited a pre-existing charity or cause such as the International Red Cross.

Another difference between sports and non-sports organizations has to do with multiple beneficiaries. Non-sports companies target many beneficiaries 53% of the time versus sports' 35%. The reason behind this is volunteer programs. Non-sports corporations have an abundance of employee volunteer programs and matching-gift programs whereby the beneficiaries are selected at the discretion of the employees of a company. Not only did this increase the number of initiatives that had multiple beneficiaries, but it also provided a surge in the number of initiatives as a whole. Professional sports organizations had very few volunteer programs that are documented on a national level because most of their volunteerism is accounted for by teams or individual players.

Future research may determine whether decision-makers in professional sports organizations feel that being socially responsible can impact profits. Another way to look at the question is whether or not sports, under the entertainment category, differs from Fortune 500 companies that offer products and non-entertainment services. An issue for professional sports leagues that also might be further investigated is the choice between social responsibility efforts that target the issues of individual communities versus national initiatives. With national initiatives it would seem to be easier for sports leagues to maintain their visibility and get credit for being socially responsible.

Finally, should sports leagues be automatically linked to the individual efforts of athletes? Many athletes have their own foundations and charities, and many times it is overlooked that those social responsibility efforts should be credited to individuals. Often the initiatives are automatically associated with the league that represents them. While this study has examined the social responsibility practices of sports organizations, little is known about the impact of these practices on consumers. Future research should address how consumers respond to, and are affected by, the social responsibility initiatives of sports organizations.

Appendix: Organizations in Sample

Professional Sports Leagues

Arena Football League (AFL)
 Association of Tennis Professionals (ATP)
 Association of Volleyball Professionals (AVP)
 Indy Racing League (IRL)
 Ladies Professional Golf Association
 of America (LPGA)
 Major League Baseball (MLB)
 Major League Lacrosse (MLL)
 Major League Soccer (MLS)
 National Association of Stock Car Auto
 Racing (NASCAR)
 National Basketball Association (NBA)
 National Football League (NFL)
 National Hockey League (NHL)
 Professional Bowlers Association (PBA)
 Professional Golf Association of America
 (PGA)
 Women's National Basketball
 Association (WNBA)
 Women's Tennis Association (WTA)

Non-sports Companies

General Electric
 Sears Roebuck & Co.
 Duke Energy
 Xerox Corp.
 Kimberly-Clark Corp.
 Whirlpool Corp.
 Northwest Airlines Corp.
 Marriott International, Inc.
 Avon Products Inc.
 Owens-Illinois
 Cox Communications
 Auto Zone Inc.
 Applied Materials Inc.
 Hershey Foods Corp.
 United Stationers Inc.
 ServiceMaster

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Personal Privacy: Risks of the Internet

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Abstract

The purpose of this paper is to identify threats through the use of personal computing via the Internet. The research consists of the following: (1) identifying types of risks, (2) their effects, (3) awareness and prevention of risks, and (4) the future. The information here is intended to increase awareness and prevention in hopes of stopping identity theft and the loss of personal information. Finally, this paper presents a few of the common risks and how to prevent them.

Introduction

Your personal information is at risk. The world is more dependent than ever on the Internet to manage businesses, communicate, and participate in e-commerce. These are common activities that place users at risk of becoming victimized. Personal privacy needs to be protected from the plagues that are rife on the Internet. Internet crimes are increasing with the rise of Internet use and it is apparent that many users are unaware of them. Hackers and other Internet criminals take advantage of uninformed users and this makes it imperative that users learn how to defend their information. The risks of using the Internet expose online users to many threats such as spam, worms, viruses, and phishing, which block communication, cause damage, or access private information from the victim. Avid and novice users of the Internet need to be aware of the risks in order to prevent themselves from becoming casualties.

This research focuses on spam, worms, viruses, and phishing, which invade personal privacy and have adverse effects on a user. Spam is unsolicited email that can cause loss of communication and has the potential to create other threats. It may serve as a link to other computer threats because it either has been sent or downloaded to random email addresses. Worms are associated with spam because the worm designers are paid to create mechanisms (worms, in fact) that help send spam emails. Once downloaded into a network, worms can replicate, slowing networks and causing potential shutdown. Similar to worms, viruses, when downloaded, cause damage, and some of them relay personal information back to the hacker. Phishing is a form of spam sent to random emails to trick the user into revealing their personal and financial information. All of these risks are an invasion of privacy. Learning their uses and effects will prevent them from occurring.

Spam

Spam email is defined as unsolicited commercial email, or “junk mail” (Webopedia, 2005c). It is used to solicit items and services and it is having a deleterious effect on the use of email. “Spammer” is the term for a sender of these emails. Spammers obtain email addresses by accessing them through websites, purchasing lists from a legitimate source (who is unaware of

how they will be used), and buying lists from other spammers. Also, some spammers perform so-called dictionary attacks using a special type of software to test millions of random email addresses on a mail server and then create a new list of valid email addresses. (See the University of Texas at Austin website.)

Spam is used to distribute millions of uninvited emails to Internet users. It is an invasion of an individual's privacy and it can block other important emails by filling up email boxes. Also it offends some of the readers with its content, which creates a dislike for using email. When people have been literally sent thousands of unwanted emails, it blocks communication not only between individuals at home but also at work. Mass email "eats" up bandwidth, slowing Internet speed and business networks.

Spam is known throughout the world as one of the most irritating forms of invasion of personal privacy. Millions of emails are sent out yearly to mail servers and they affect virtually any organization. The National Institute of Environmental Health Sciences, for example, averaged almost six million emails a year from 2002 to 2004. This led NIEHS to monitor emails by using tools to block spam and dangerous email attachments, measures that should be mirrored by others in order to ensure privacy (NIEHS, 2005).

The future looks a little bleak for the average online user because the necessity of dealing with spam in its various forms will likely continue. Other types of spam are called "spim," which is spam sent via instant messaging, and "spit," sent over Internet telephony. It seems that any device with Internet access is likely to be spammed, clogging commercial-free communication (Thomas, 2005). Spammers gain access to email servers by using computer worms, a subject discussed below.

Worms

A computer worm is defined as a self-replicating computer program that is normally created to infiltrate unprotected file transmission capabilities on personal computers. Worms are different from viruses insofar as they spread themselves through a network without being attached to an email or file. Computer worms gain entrance through the backdoor, so to speak, on an infected system, and they can be quite detrimental, depleting the computer's resources and sometimes shutting the system down. Spammers use worms to do general or specific tasks, both dangerous to personal privacy. That is, they pay for worms that create the backdoors in order to send their "junk mail" or monitor the user's Internet activity of infected or "zombie" computers. Some worms are written to create access, and after the backdoor is created, the creator exploits it by the use of other worm programs to access information.

A worm can access a network either through email, downloads, or installed infected software. Once in the network, it spreads itself without the help of an email or another file. This action often stifles networks because of the amount of traffic due to the worm's replication. While active in the network, various worms are designed to perform malicious functions. Worm designers have been caught selling IP addresses of infected machines while others have tried to blackmail companies with threats of a distributed denial-of-service (DDoS) attacks. "A distributed denial-of-service attack is an attack on a computer network that causes a loss of service to users, and typically the loss of network connectivity and services by consuming the bandwidth of the victim network or overloading the computational resources of the victim system" (Wikipedia, 2005b). When worms are loose they cause terrible damage to a company or a system.

The computer worm is a serious issue to corporations and governmental agencies in part because of its rapid replication without an executable file. As a result, officials are often at a loss as to the worm's origin. While the media neglect attacks on small organizations, occasionally

large-scale attacks capture media attention, as, for example, when 1,000 governmental employees turn on their machines Monday morning and a worm promptly spreads and shuts down all systems until Wednesday afternoon. The computer worm is also a serious issue because it may attack the very programs that are designed to protect computer systems. For instance, the Sober worm, which makes up about five percent of emails has added a virus, and is now called the Sober-Q Trojan. This invader will delete live-update files from Symantec that contain new virus definitions. This means it will disable the user's Norton Antivirus updates, leaving a system vulnerable. Worms mixed with other viral programs are especially dangerous and require that all precautions be taken against it (UPI, 2005).

The proliferation of worms does not seem to be slowing down and may well increase. Spammers hiring worm developers for access to "zombie" computers in order to send unsolicited emails will very likely continue to use this method because it is almost untraceable. Worms used to gain entrance into vulnerable systems and networks, therefore, may be expected in the future, causing a great deal of trouble and invading individuals' and institutions' privacy.

Viruses

A virus is malicious code that is downloaded to a user's computer without the user's knowledge. It attaches to an executable program and it has the ability to replicate like a computer worm (Webopedia, 2005d). Once the virus reproduces, it rapidly uses all the memory of a system, bringing it to a standstill. There are at least 16 different types of viruses that are well documented. Some of the more common viruses are boot, file infector, and Trojan. The boot virus is not activated until the user's system is rebooted and then it infects the hard drive. It attacks the critical information on the drive and may cause a loss of information. The file infector infests and damages programs or executable files. The most common viruses are Trojans. They may appear to be harmless programs but they install other programs on the computer that can be harmful. Once activated, these programs have the ability to delete files, open backdoors, or destroy hard drive information. And the backdoor allows an intruder to copy personal information from the user and resend it elsewhere (Panda Software, 2005).

A computer virus has to attach to an executable file or email to infect a computer. The way to contract a virus is through normal computer usage such as email attachments. One infected message can render a whole system or network inoperable. Also, such activities as Internet browsing can cause users to receive a virus. Some web pages with Java applications and Active X controls can hide viruses that are spread simply by visiting the web site. Peer-to-peer networks (P2P) can easily infect a computer because the user does not know the person they are downloading from or exactly what they are downloading. Viruses can also spread through floppy disks, CDs, and other types of removable storage. Viruses are ubiquitous and their dissemination shows no signs of abating (Panda Software, 2005).

As more viruses travel through the Internet, disguised, the average user or organization will become more vulnerable. Viruses improve as security measures improve because most virus definition files have to be updated weekly. They are even teaming up with phishers, combining both email and viruses to create effective scams.

Phishing

Phishing is the action of sending an email to a user while falsely claiming to be a valid enterprise in an effort to scam the user into surrendering private information that will be used for identity theft. The purpose of the email is to persuade the user to send out personal and private

information. As one reads the email, he or she is prompted or sent by hyperlink to another website to update personal information. The information that is usually requested includes passwords, credit card numbers, Social Security numbers, and account numbers (Webopedia, 2005a). The phishing scammer wants victims to think that it is a genuine organization that already has access to users' personal information.

Rather than wipe out a computer file, phishing scams can wipe out a bank account. If, for instance, users disclose confidential information such as their credit card numbers, the phish scammer can then buy expensive items at users' expense. Large debts and damaged credit reports can ruin the lives of people who are forced to repay the debt as well as rebuild credit. If a victim is fortunate enough to catch the scam at an early stage, any lost money or assets can be returned, but even in this case, much time and effort must be expended to arrange for new credit cards and to check credit reports.

The targets of phishing are anyone who has an email account. They are usually asked to enter information for services that a person apparently already subscribes to, such as banks, insurance companies, software companies, investment accounts and so on. Although bogus, the websites that users are directed to appear legitimate. Scam artists are extremely detailed in recreating corporate websites through the use of html formats. According to the Division of Consumer Service, (DOACS), phishers are able to convince up to 5 percent of recipients to respond (Express Computer, 2005). While this may seem trivial, it means that for every 100,000 appeals, 5,000 users will be taken in.

Phishing is no longer limited to the normal hyperlink embedded in the user's email; in its new form it has become a virus. Hackers have now adopted the scam that most virus writers have used to get information from the user's computer by planting Trojan horses. Trojans take advantage of a vulnerability in Windows. They install themselves on the user's machine invisibly and without warning. As a result, users no longer have to click on the hyperlink in the email to go to "spoof" sites. Now, all it takes is for an individual to open an email – a Trojan is attached, waiting for users to login to bank sites, credit card sites or eBay. One vendor, Sophos, calls this current phishing scam the JS/QHosts21-A, which arrives in an html email that displays the Google webpage. The JS/QHosts21-A is just the beginning for this new form of phishing. Security experts say it will get worse by making changes to a user's host files. According to PC World.Com (2005), a host file is a component of Windows that a browser first looks to when it converts a domain name that users enter into the IP address it needs to load a webpage. The best way to deal with these threats is to be aware of them and be extremely cautious in divulging personal information online (Anti-Phishing Working Group, 2005).

Prevention

Presumably, the above information has raised awareness to some of the risks of the Internet. Keeping the user's information private can prevent identity theft, computer system shutdown, or loss of personal information. The obvious next step is how to stop these threats from invading personal privacy.

To protect against most of these threats there are certain tools to help with the problem. For protection against worms and viruses, a user should install a firewall and an antivirus program. That includes frequent updates that should come from a reliable source. The firewall with the correct security settings will stop most worms and viruses. If one does slip past the firewall, the antivirus program should detect the intruder and either delete, disable, or quarantine it. As long as the programs are promptly updated, they will be effective. A user can visit Download.com to get free firewalls and antivirus programs as well as free trials for paid firewall, anti-viruses, and

suites. Spam is more difficult because no matter how hard a user tries, spam cannot be entirely eliminated, but it can be minimized. To reduce spam, users should request spam-blocking tools from their Internet service provider (ISP), university, business, organization or mail server for spam blocking tools. The blocking tools will at the least eliminate repetitive emails.

A few easy steps can be taken to avoid becoming a victim of phishing. The first is “don’t click on the link.” That is, if receiving an unexpected email or pop-up message that asks for personal or financial information, do not reply. A legitimate company will never ask for personal information through an email. Second, before one sends confidential information via the Internet, always look for the little “lock” icon in the browser’s status bar, which lets a customer know that the website is secure to send information (McFedries, 2005). Other preventive options are contacting the company via telephone or forwarding suspicious emails to ftc.gov, the official website of the U.S. Federal Trade Commission. Also, one may report false websites to the Anti-Phishing Working Group (their slogan is “committed to wiping out Internet scams and fraud”). This group investigates such reports and works to have the deceptive websites removed.

The Future

New electronic threats to personal security and privacy will evolve over time. Among the most recent is Wiphishing (pronounced “why phishing”). “By its use, it can expose all the shared information on the user’s laptop and it has the potential even to get information off of traditional wired computer networks” (Business Wire, 2005a). Wiphishing hackers do not even have to be in the same building as the user: they can be across the street in a parking lot. This wireless hacking, using Bluetooth technology, even has the ability to capture passwords. Software on the market can counteract the epidemic of Wi-phishing. Companies such as WiTopia. Net, which specialize in Bluetooth security, can eliminate the risk of wireless hacking (Business Wire 2005b) with, among other things, the installation of AirSafe Personal.

It would appear that there will be an ongoing struggle between new threats to personal security and new preventive measures into the foreseeable future. And while threat-prevention technology will be developed to offset emerging technological invasions, it cannot work if it is not fully employed. Thus, awareness on the part of computer users is a vital part of the ongoing challenge.

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The Telecommunications Act of 1996 and Its Effect on Diversity

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Introduction

The Telecommunications Act of 1996 was the first major statutory change to U.S. communications law since the Communications Act of 1934. Since its passage, critics have noted that media ownership has experienced a dramatic shift from diverse ownership to ownership dominated by a few powerful firms. Critics posit that this has resulted in media that do not represent all the social and political perspectives that comprise American society. For them, media constitute a key ingredient in American democracy. Critics fear that this change in media concentration has resulted in less diversity in the marketplace of ideas. This paper examines the law in place before the passage of the Telecommunications Act of 1996, the reasons for its passage, the changes the law made to existing media ownership rules, and its impact on media ownership. The paper also examines the law's effects on diversity along two dimensions—diversity of viewpoint and diversity of source—as they relate to American democracy.

A History of the Communications Act of 1934

The Communications of 1934 was created to deal with the anarchy of the communications industry at the time. The Act had two clear purposes, which Title 1, Section 1 detailed. The first purpose was to regulate “interstate and foreign commerce in communication by wire and radio” in order to provide “rapid efficient, nationwide, and world-wide wire and radio communication service” to all Americans.¹ The second purpose was to create an administrative body called the Federal Communications Commission to enforce the provisions of the Act. In the area of common carriers (telephone companies), Congress’ primary concern was to ensure “continuing surveillance” of American Telephone & Telegraph, which had evolved into a monopoly under the protection of patent laws from 1876 to 1894.²

The Federal government began to regulate radio waves with the passage of the Wireless Ship Act of June 24, 1910, 36 Stat. 629.³ The Wireless Ship Act proscribed any ship from leaving port carrying 50 or more passengers unless it was equipped with adequate radio equipment for communications operated by a skilled operator. Passage of this legislation, coupled with the United States’ ratification of its earliest international radio treaty, led to a need for broad regulation of the airwaves. To meet its obligation under the treaty, Congress passed the Radio Act of August 13, 1912, 37 Stat. 302.⁴ This Act mandated a license for operation of radio equipment to be obtained from the Secretary of Commerce and Labor. Certain frequencies were set aside for the government, and Congress enacted restrictions for proper use of radio for transmission of distress signals under the Radio Act of 1912.

Interference or crowding of the airwaves developed into a serious problem after World War I. Interference takes place when two signals share spectrum in all three of its dimensions: space, time, and frequency. Technological development of the radio accelerated by the war resulted in formation of the earliest broadcast stations in 1921. By 1924, radio had rapidly developed into a chaotic cacophony of noise in which no one was heard. This crowded spectrum environment led to Congressional intervention. Congress divided the spectrum into bands for particular kinds of services. They also addressed some of the inadequacies of the Act of 1912; particularly spectrum allocation for private broadcast stations. From 1921 through 1926 the airwaves became even more crowded with almost 600 stations vying for the same limited amount of spectrum; this prompted the creation of the Federal Radio Commission (FRC) through passage of the Radio Act of 1927.⁵

The sharing of its responsibilities with the Interstate Commerce Commission (ICC) hampered the Federal Radio Commission's administrative effectiveness. The FRC regulated radio. The ICC had jurisdiction over rate charges for common carriers. However, it did not have the personnel or knowledge to deal with the growing new technology of the telephone, which was quickly replacing the telegraph for long distance communication. The primary focus of the Interstate Commerce Commission for 23 years had been regulation of transportation on railroads, stagecoaches, canal boats, and wharves.⁶ Still, it maintained regulatory responsibility over telegraph and telephone systems from passage of the Mann-Elkins Act 1910 until 1934 when the communications business had become large enough to require regulation.⁷ Referencing a report issued by the American Bar Association in 1932, the Secretary of Commerce detailed the scope of the problems facing the communications industry in a 1934 letter to President Franklin D. Roosevelt as follows:

In this connection it should be borne in mind that there is now no Government agency authorized to deal with communications problems as such. The Interstate Commerce Commission has certain jurisdiction over the rates and charges of both wire and wireless companies engaged as common carriers in transmitting messages for hire in interstate and foreign commerce ... The executive branch of the Government has jurisdiction over the granting of licenses for the landing of commercial cable ... The Federal Radio Commission has authority to license and to regulate the operation but not the rates and charges of wireless communication agencies engaged in interstate and foreign commerce ... Communication problems are communication problems whether the agency employed be telephone or telegraph, wire or wireless.⁸

A little more than a month later, Roosevelt requested that Congress form a new regulatory body called the Federal Communications Commission that would have all the powers previously vested in the ICC and the FRC.⁹ Congress passed the Communication Act of 1934 on March 9. The FCC was formed to address the inefficient combined efforts of its predecessors, the FRC and the ICC, to regulate the communications industry. Through the Communications Act of 1934, the FCC was given broad power to regulate communications to meet "public convenience, interest, or necessity," an ambiguous statement that later served as a major sticking point for many who challenged the role of the FCC in regulating communications.¹⁰

The FCC

Provisions relating to the FCC are found in Title I, Section 4. The commission consists of five members appointed by the president with the advice of the Senate. The president appoints one of the members to head the commission; a commissioner's term of office lasts no more than five years. Title I, Section 4 is aimed at addressing conflict of interests on the part of the

commissioners, specifically to ensure that they do their jobs for the public good and not their own or that of individuals or companies associated with the communications industry.¹¹

From its inception, the FCC lacked ability to address the unique needs of the industry that it regulated. In attempting to alleviate the Interstate Commerce Commission's dual role of regulating transportation and communications, Congress "simply moved over wholesale the pre-existing provisions of the Interstate Commerce Act," applying "them to all communications carriers" via the 1934 Act.¹² Yet, the Communications Act of 1934 proved to be incredibly flexible because it had roots in broad statutory principles founded in the common law history of the Interstate Commerce Act.¹³ Common law is built over time from judicial interpretation rather than legislative action by Congress. This flexibility afforded amendments that brought new communications technology such as cable, satellite, and direct broadcast satellite under the jurisdiction of the FCC over roughly three decades. While the 1934 Act was flexible, technological development and legal quandaries in all communications sectors eventually outpaced its provisions, resulting in legislation studded with amendments and exceptions.

Common Carriers

Concern over American Telephone & Telegraph Company monopoly power was the impetus for the government's initial regulatory limits on ownership in communications. As such, the monopolistic AT&T was on the minds of many lawmakers, consumers, and competitors in 1934. Led by Theodore Vail, AT&T and its Bell affiliates turned the competitive telephone industry into a "shared monopoly." Under the parent company AT&T, all existing phone companies shared the benefits of revenues.¹⁴ AT&T enjoyed a privileged position as the phone company under the protection of patents secured by inventor, Alexander Graham Bell. After the monopoly period, AT&T worked to maintain its dominance, buying up independents and refusing interconnection with those it could not successfully purchase. AT&T's predatory system of doing business prevailed under common carrier regulations of Title II. This was due largely to the campaign of chairman Vail who launched "a successful propaganda campaign" that sought to combine the company's "interests with the ... public regulatory authority," the FCC.¹⁵

The "public interest" concern was not lost on common carriers that were required to provide communications service at a "just and reasonable" charge in a manner that "is not contrary to the public interest."¹⁶ A monopoly cannot be said to be in the "public interest" even when it occurs under the watch of the government because monopoly does not foster competition. Lower prices are a by-product of competition, which benefits consumers. Bell's refusing interconnectivity with independents prevented new carriers from coming into the market and confined existing independents to their existing service areas, thus stifling competition. Another practice often used by AT&T against its competitors and the FCC's regulatory attempts was cross-subsidization, a practice of subjecting consumers with no access to competition to higher prices to reduce costs for consumers with access to competition in an effort to drive competitors out of business.¹⁷ Combined with complex pricing structure, this made it almost impossible for the FCC to regulate AT&T.

In the 1950s, the FCC approval of microwave transmission systems initiated the decline of AT&T's "natural monopoly."¹⁸ By the late 1960s, the FCC adopted a policy in favor of competition allowing MCI, a new service provider in the telephone industry, to provide service under Specialized Common Carrier Services.¹⁹ The FCC continued the trend of encouraging competition by carrying out one of its mandates to develop new technologies. The commission

supported efforts by other common carriers to provide telecommunications service by encouraging competitive entrance into their fields as well. For example, domestic communications satellite facilities, direct broadcast satellites, cellular communications systems, multiple distribution service, and instructional TV-fixed service developed in a competitive environment because of the FCC's efforts to serve the public.²⁰ The commission recognized that the "public interest" was best served by competition rather than complex rate structure regulations levied against the telephone giant.

The Notion of Convergence

A major shift occurred in the marketplace and in the response of the FCC. It largely switched focus from regulation to competition as an answer to the industry's growing problems. Additionally, convergence of new technologies had lawmakers grappling with the efficacy of the regulatory scheme that was originally designed to deal with monopolistic structures such as AT&T. Major statutory amendments to the Communications Act of 1934 became desirable for different factions in the communication's industry for very similar reasons. Common carriers agreed on regulation based on four points: (a) "the need to give more specific interconnection direction in the statute," (b) "the BOC [Bell Operating Companies] desire for relief from MFJ [Modification of Final Judgment] limitations on their entry into long distance service and manufacturing," (c) "the need to re-allocate jurisdiction between the FCC and the state agencies," and (d) "growing support for deregulation."²¹ The last of these is one on which most carriers find consensus.

The late sixties marked the convergence between computers and communications technology.²² Cable started out as a localized service provided to people in remote areas who were outside the reach of regular broadcast television stations. It then developed into high-tech broadband services that had the potential for connecting millions of homes and offices via one pipeline for all their communications needs. Fiber optics catalyzed broadband's potential for replacing telephone in speed and capacity for communications. FCC chief of policy development Dr. Robert Pepper identifies two driving forces for the eventual use of "integrated broadband networks," one of which is increasing consumer demand for such products, the other fiber optics. He calls attention to the "institutional constraints" placed on the new technology by local exchange carriers (LEC). Pepper sees these barriers that unduly affect the cable television industry as hindering competition that is vital to meeting the consumer's needs. Broadband's potential for convergence led the FCC to ban cable-telephone cross-ownership in the 1970s.²³

The election year of 1992 was the year of convergence. The idea of merging technologies drew notable Congressional attention when it became evident that cable companies could become competitors for LECs. "Door-to-door fiber optics systems" found their way into presidential election campaign rhetoric by democratic nominee Bill Clinton, who supported providing fiber optic integrated services to every "home, every laboratory, every classroom and every business in America" by 2015 (*Wall Street Journal*, 23 April 1992, sec. A6). There was significant debate about the challenges facing the cable carriers that thwarted their ability to break into the telecommunications market, such as state control over entry and telephone companies' unwillingness to deploy universal fiber optics that would enhance cable carriers' delivery of video programming.²⁴ The telephone companies contended that they wanted their piece of the video pie in the form of programming profits, a move that would constitute the telephone/cable cross-ownership prohibited by previous 1970s legislation.

Broadcast Ownership Provisions of the Communications Act of 1934

The original Communications Act of 1934 sought to limit monopoly and encourage competition under Title II and Title III. Under the interlocking directorates section, it barred officers or directors of communications companies from holding such positions in more than one company that fell under the jurisdiction of the Act without authorization from the commission.²⁵ It subjected mergers between one or more telephone companies to special review by the commission to determine if they met the public interest criteria and to prevent a repeat of the AT&T monopoly situation.²⁶ Section 313 and 314 and Title III were written generally to deal with antitrust and preservation of competition in the marketplace using legalese such as:

No persons engaged directly, or indirectly through any person directly or indirectly controlling or controlled by, or under direct or indirect common control with, such person, or through an agent, or otherwise, in the business of transmitting and/or receiving for hire energy, communications, or signals by radio in accordance with the terms of the license issued under this Act, shall by purchase, lease construction, or otherwise, directly or indirectly, acquire, own, control or operate any cable or wire telegraph, or telephone line or system between any place in any State, Territory, or possession of the United States or in the District of Columbia, and any place in any foreign country, or shall acquire, own, or control any part of the stock or other capital share or any interest in the physical property and/or other assets of any such cable, wire, telegraph, or telephone line or system, if in either case the purpose is and/or the effect thereof may be to substantially lessen competition or to restrain commerce between any place in any State, Territory, or possession of the United States, or in the District of Columbia, and any place in any foreign country, or unlawfully to create a monopoly in any line of commerce.²⁷

This passage summed up the commission's position on these issues, leaving room for broad interpretation of the law in future matters relating to monopoly and competition.

Amendments to the law

Congress used vague and sweeping language to give the FCC what critics might call unlimited power. However, both Congress and judicial interpretation and application have curtailed the FCC's power. Additionally, the courts often issued rulings that set precedents, which prompted Congress to adopt amendments to the Act. As new situations arose, Congress added new rules to carry out the FCC's mandate for preserving competition in the marketplace. The Communications Act of 1934 incorporated several broadcast ownership rules as a result of judicial rulings. As per the Telecommunications Act of 1996, these six rules required review to determine if they were necessary for preservation of competitive markets and serving the public interest. These six rules are addressed below.

The first of these dealt with the deregulation of radio ownership. Nationwide radio ownership caps experienced deregulatory changes over four decades: "from 7 AM and 7 FM in 1953, to 12 AM and 12 FM in 1984, to 18 AM and 18 FM in 1992, to 20 AM and 20 FM in 1994."²⁸ Section 202(b) dealt with changes to local radio diversity. Local radio ownership deregulation had its start in the early 1980s. From 1981 to 1994, the FCC gradually relaxed both national and local radio caps.²⁹ Initially, the local radio ownership/duopoly rules (1941) banned co-ownership of same service radio stations (AM or FM) from operating in the area. With the enactment of the Telecom Act of 1996, the commission had an already relaxed model for local market radio ownership. Market conditions provided the basis for the following rules. In markets where there were: (1) 40 or more stations, radio station ownership was capped at 3 AM and 3 FM stations; (2) 30 to 39 stations, radio station was capped at 3 AM and 2 FM; (3) 15 to 29 stations, radio

station ownership was capped at 2 AM and 2 FM, so long as the combination did not exceed 25 percent of the market audience; (4) 14 or fewer stations, radio station ownership was capped at 3 stations, with no more than 2 stations in the same service area, provided that the combination did not result in ownership of 50 percent or greater of radio stations in the market.³⁰

The second of these rules dealt with television ownership limits. National television ownership rules (1941) originally limited common ownership of TV stations to no more than three nationwide.³¹ In 1954, the commission replaced those limits with a “Seven Station Rule” nationwide.³² These caps were increased to 12 stations nationwide in 1984. In a later motion for reconsideration, a national “audience reach cap of 25 percent” was added while maintaining the numerical limit of 12 stations nationwide.³³

A third television “duopoly” rule (owning more than one television station in the same market) dealt with ownership restrictions in local television markets. The local television ownership rules were adopted in 1964. Prior to passage of the Act, the rule prohibited ownership of two or more television stations whose “Grade B” contours overlap.³⁴

The fourth dealt with cross ownership between radio and television. The “one-to-a-market rule,” or radio/television cross-ownership restrictions, passed in the 1970s, essentially prohibited cross-ownership of a radio and television station in the same market.³⁵ In 1989, the commission amended the rule providing waivers of the restriction in the nation’s “top 25 television markets,” provided that there remained “30 independently owned broadcast voices” after the merger, or if the merger involved a “failed station.”³⁶

The fifth set of rules dealt with of dual television network ownership. First adopted in 1941, the dual network rule originally prohibited anyone from owning more than one radio network. It was later amended to include television networks in 1946.³⁷ Prior to 1996, the Commission generally disallowed “a party from affiliating with a network organization that maintained more than **one** [bold added for emphasis] network of television broadcast stations.”³⁸

Adopted in 1984, the sixth cable/television cross-ownership rule found in Section 202(f), codified prohibition of cross-ownership between a cable system and a broadcast television system. This rule remained in place until 1996.

The Communication Act of 1934 Revised by the Telecommunication Act of 1996

President Bill Clinton signed the Telecommunications Act of 1996 into law, which relaxed or abolished most of these restrictions. It also set strict time frames for review of those provisions that hindered competition. The law made important changes in areas that dealt with media co-ownership.

Section 202(a) covers changes to national radio station ownership. For radio ownership, the law removed the national caps on ownership and audience reach. Local market radio station ownership restrictions remain in place to ensure that no one owner has more than 50 percent of the stations in any given service area; however, it increased the caps on ownership allowing ownership of more stations by one entity in a given market. In areas where there are: (1) 45 or more stations, radio station ownership is capped at 8 with not more than 5 in the same coverage area (AM or FM); (2) 30 to 44 stations, radio station ownership is capped at 7 commercial stations with no more than 4 in the same coverage area; (3) 15 to 29 stations, radio station ownership is capped at 6 with no more than 4 in the same coverage area; (4) and in areas with 14 or fewer radio stations, ownership is capped at 5 with no more than 3 in the same service area.³⁹

In Section 202(c), Congress raised the national television ownership limit from 25 percent national audience reach to 35 percent, and it “eliminated the numerical limit on the number of broadcast television stations” that any “entity could own nationwide.”⁴⁰

At the time of the Telecom Act, Congress did not make changes to the television duopoly rule. Instead, it recommended in Section 202(c) that rulemaking be conducted to determine if current numerical limitations on the number of stations that an entity can own or operate within the same local market should be eliminated, modified, or retained. In a subsequent 1999 Report and Order, the FCC narrowed the scope of the television duopoly rules from the “Grade B” signal contour definition to Nielsen Designated Market Area (DMA) test. This new ruling allowed ownership of two or more television stations regardless of contour overlapping, provided that they are not in the same DMA.⁴¹ It allowed common ownership of two television stations in the same DMA under certain circumstances: (1) There must be eight independently owned, full-power television stations remaining after the merger. (2) The merger does not involve one of the top four ranked stations in the market, which is based on audience share.⁴² Additionally, it allowed special provisions for waivers to allow same-market licensee holders to acquire a second station provided that the merger involved a “failed station,” “failing station,” or where the applicant can show that the waiver will result in the construction of a new broadcast station facility that was previously “unbuilt.”⁴³

The FCC changed the “one-to-a-market” rule, found in section 202(d), to extend its policy of granting cross-ownership waivers for radio-television combinations to the top 50 markets, up from the top 25 markets rule of 1989.⁴⁴ The Act now allows common ownership of one television station and up to 7 radio stations in the same market, provided that certain market conditions exist.⁴⁵

Section 202(e) revised the dual television network rule. Section 202 allowed a single entity to own two or more television networks unless, the combination includes (1) two or more of the four stations existing at the enactment of the law (ABC, CBS, NBC, FOX) or (2) one of the two emerging networks (WBTV, UPN) in existence on the date of enactment of the Telecom Act, which, through agreements with English-language programming affiliates, provide four or more hours of weekly programming that reaches 75 percent of all television homes nationwide.⁴⁶

Repealed in Section 202(f), the Cable/Television Cross-Ownership rule, now allows an individual or party to own or run a “network of broadcast stations and a cable system.”⁴⁷ According to introductory Section 652 of the Telecom Act, all of these changes had the intended goal of “increasing competition,” and reducing regulation to secure better prices and higher quality communications products for the American consumer, “and to encourage rapid deployment of new telecommunications technologies.”⁴⁸

The Telecommunication Act of 1996 and Its Impact on Media

The radical changes detailed above prompt an important question: Did the Telecom Act of 1996 achieve its intended purpose of increased competition? The statutory language of the Telecommunications Act is expressly concerned with the public interest; diversity and competition are both essential to public interest.⁴⁹ Therefore, subsequent to the question of competition is the question of diversity. Have the current moves to deregulate broadcast ownership enhanced diversity in the marketplace of ideas? The remainder of this paper will respond to these questions.

Pursuant to comments in a 1998 Notice of Inquiry (NOI), the FCC has a historical twofold responsibility of promoting competition and maintaining viewpoint diversity. In recent times, the legislative shift towards competition as the cure for the communications industry resulted

from decades of amendments to the Communications Act of 1934, a document which no longer suited current market and technological conditions of the industry. In 1996, Congress made it clear to the commission that deregulation is the new directive for the FCC as it relates to media ownership. Nevertheless, the FCC's goal of maintaining diversity remains equally important. Achievement of diversity has been elusive because it is by definition anomalous and not easily measured. According to Commissioner Michael Powell, it is important to have a clear, well-defined meaning of the word *diversity* before any attempt to implement the FCC's mandate for diversity in the marketplace of ideas.⁵⁰

The 1998 NOI provides the definition. First the commission defines diversity in legal terms set forth by the Supreme Court's application of the First Amendment to media. According to Supreme Court precedents, the public interest is best served when information comes from "antagonistic" and varied sources. When these two conditions are met, true diversity is achieved. The NOI further clarifies diversity by dividing it into three subcategories: viewpoint, source, and outlet. The commission defines its role in promoting viewpoint diversity as making sure that the media are providing information from a variety of opposing perspectives and readings. Source diversity refers to a multiplicity of information producers and providers of these services. Finally, outlet diversity refers to whether media are provided via an array of delivery mechanisms such as broadcast stations, cable, newspapers, and DBS that are delivered directly to the public.⁵¹

Effects on Radio and Television

Diversity in the marketplace of ideas must continue to be a goal if the FCC is to meet its public interest standard. Since 1996, radio has experienced extensive concentration. On the national front, the radio ownership and audience reach caps were eliminated. Locally, the rules were relaxed to allow for ownership of more stations within a given market by a person, company, or entity. In a 1998 NOI, the commission concluded that the radio industry experienced improved efficiency and financial gains. Conversely, competition and diversity suffered under the deregulation of 1996.⁵² This section will examine the effects of deregulation on diversity of viewpoint and diversity of outlets, first as it relates to the radio industry, and then as it relates to the television industry. Outlet diversity will not be discussed because it requires a comprehensive review of other media that are not covered in this text.

Radio

Viewpoint diversity is directly affected by source diversity.⁵³ That is to say, a decrease in the number of independent information programmers and producers results in less diverse presentation and interpretations of issues. The Future of Music Coalition conducted extensive research to study the effects of deregulation on radio, citizens, and musicians. Its findings suggest a rash of radio station acquisitions immediately after passage of the law, which resulted in considerable consolidation. To add further support to this conclusion, they reviewed data about the number of owners versus the number of commercial radio stations between 1996 and 2002. Ownership of commercial stations decreased from 5,133 to 3,400, a 33 percent decrease over five years.⁵⁴ Conversely, commercial radio stations grew by five percent over the same five years.⁵⁵ A report on minority ownership issued by the National Telecommunications and Information Administration (NTIA) suggests a decline in minority ownership of commercial stations due to the consolidation. The NTIA expresses concern about a 60 percent decrease in minority ownership between 1995 and 2000. In 1990, when the NTIA first started issuing

reports, minorities owned 29 full-powered radio stations. That number increased to 38 in 1995 and 1996. By 2000, that number had plummeted to 23 minority-owned, full-powered minority-owned stations in the country. In the report, the NTIA stated that “consolidation still threatens the survival of most minority owners” who primarily operate stand-alone radio facilities. The new concentrated economic marketplace facilitated by the Telecom Act of 1996 makes stand-alone minority radio owners less competitive against their larger, concentrated, non-minority competitors. Additionally, the report finds that minorities tend to own more AM stations than FM stations (278 AM stations versus 178 FM stations in 2000). AM stations tend to have poorer sound quality. This technical limitation has resulted in declining listenership. With the number of independent owners as a measure of source diversity, the data provided by the coalition and the NTIA suggests that source diversity has decreased.⁵⁶

Viewpoint diversity refers to programming diversity in the radio industry.⁵⁷ In its study, the Coalition mainly views programming diversity in light of music. Still, their findings are relevant to clarify the public interest standard within the context of the radio industry. The data suggest that almost every radio format is an oligopoly. An oligopoly is a market situation in which four of the largest companies in a given industry control greater than 50 percent of the market shares.⁵⁸ As of May 2001, the top four firms in the radio industry are Clear Channel, Viacom, Cox, and Entercom.⁵⁹ Citing data from Media Access Pro and the BIA Financial Networks, the Coalition shows that these four firms control at least 50 percent of listener shares in all except two (Religion and Nostalgia) of BIA’s 19 format categories. Of the 19 BIA format categories, 11 are more than 60 percent consolidated.⁶⁰ Data for non-music format categories suggested a similar trend in the BIA database. Four firms control 66.6 percent “of the nation’s News format listeners.”⁶¹ In its 2000 Biennial Review, the FCC cites the comments of other organizations that lend additional support to diminishing viewpoint diversity. Air Virginia notes that “large group-owned stations” tend to focus more on “revenue-generating entertainment.”⁶² The Center for Media Education (CME) finds that consolidation has resulted in “reduced public-affairs and local-news programming.” CME attributes decrease of coverage in these areas to increased use of outsourcing and syndication by group-owned radio stations.⁶³ According to the Coalition, the presence of one of the four dominant stations in every market means that fewer people are involved in making programming decisions. This results in fewer new music choices and programming philosophies. There is also a greater chance of prejudice in news coverage of the news. With a 33 percent decrease in radio owners, the public has lost some of the diversity of programming that is inherent in independently owned radio companies.⁶⁴

Television

Television has experienced similar trends towards consolidation as radio, although not to the same degree. While comprehensive research about trends in television ownership has not been conducted, available data suggests that television also experienced a rash of acquisitions in the years following the Telecom Act of 1996.⁶⁵ In an annual report on local TV ownership, Journalism.org tracked the number of stations owned by the top 10 owners between 1995 and 2003. The top 10 stations are FOX, Viacom, NBC, ABC, Tribune, Gannett, Hearst, Sinclair, Belo, and Cox. Citing information from Media Access Pro, BIA, the report shows an increase in ownership by all of the top 10 owners. In 1995, the top 10 firms owned 104 stations. By 2003, they owned 318 stations.⁶⁶

In 1993, the local television landscape had four levels with the top four networks (Fox, Viacom, NBC, and ABC) owning 126 stations in most of the top markets.⁶⁷ This level is followed by chain owners that are mostly regionally concentrated. For example, Belo is mostly

concentrated in Texas and the Northwest. The next group is medium-sized chains that are not powerful enough to get attract Network deals or market shares.⁶⁸ Local owners are disappearing from the television landscape. Additional studies are necessary to make any conclusive statements about the impact of ownership deregulation on diversity in the television industry. However, considering the relationship between source and viewpoint diversity as defined by the FCC and confirmed by the Future of Music Coalition, it is quite possible that there would be similar findings given the same regulatory conditions (complete removal of national television ownership caps). To date, national television ownership is capped at 39 percent national audience reach. This cap is now federal law; therefore, it is no longer subject to biennial reviews, making it difficult to overturn.⁶⁹

The Economic Marketplace of Ideas

As noted by critics of deregulation, diversity in the marketplace of ideas when viewed from a historical and legislative perspective has decreased in the areas of viewpoint and outlet. It is important to note other positions in the diversity debate. Opponents of regulation point out that the Antitrust Division of the Department of Justice already achieves the goal of diversity.⁷⁰ In the 2000 Biennial Review, the commissioners note that deregulation might result in economies of scales that allow radio owners to cut operating costs by consolidating radio station facilities. These cost-cutting moves would in turn generate revenue that can be invested in more advanced news gathering technology and a larger more efficient news staff, all for the purpose of serving the public interest. From this economic vantage point, the FCC references the comments of Fuller-Jeffrey Broadcasting Companies, Inc. which says that consolidation has encouraged diversity in the marketplace of ideas.

Commissioner Susan Ness, who like the Supreme Court, supports diversity in news and information from “antagonistic” and “independent” sources, opposes this argument. For Ness, truly antagonistic media have different owners. She also calls into question the argument of those who say that there are now more choices than ever before. Ness makes the distinction between “multiple sources” of news and information made available by one company as opposed to “independent choices” that might come from a competitor.⁷¹ While it may be true that the quality of media products has improved due to profits gained from cost-cutting measures such as consolidation of facilities, this does not negate the fact that there are now fewer owners producing more media information for the American public. Proponents of deregulation often attempt to blur the line between these two ideas. With diversity redefined, it is easy to accept their position that there is more diversity than ever before.

Relevant to the debate on diversity are the economic and legal circumstances that prompted passage of the Communications Act of 1934 and formation of the FCC was the monopoly control by AT&T. AT&T used its monopoly power to limit diversity of outlets in local markets using cross-subsidies to put competitors out of business in areas where the FCC allowed competitors to enter the market. The traditional FCC definition of viewpoint diversity has been based on the “number of independent viewpoints expressed in local markets.”⁷² In the 1930s, AT&T used its monopolistic, financial, and technological advantage to stifle competition in local markets.⁷³ AT&T’s behavior led Congress to encourage competition by limiting co-ownership and concentration under subheading, Interlocking Directorates, Title 2, and Section 212 of the Communications Act.⁷⁴ Furthermore, the public utility quality of common carriers warranted government regulation to ensure that large common carriers did not abuse the public trust by imposing high prices and stifling competitors through anticompetitive business moves. In a 2000 article, University of Pennsylvania Law Professor C. Edwin Baker describes the common

carriers' public utility quality as follows: "Phone companies [common carriers] existed to serve people's communications needs [much like the water and gas company] and were subject to any form of regulation that served those needs. Individuals, not corporate enterprises, were the fundamental constitutional rights holders and any rights that media enterprises hold were derivative."⁷⁵ Here, Baker describes yet another shift in the Supreme Court's application of the First Amendment to media entities, from viewing them as common carriers that exist to serve the public to "rights-bearing units" themselves. Once again a change in fundamental view of the media/press has resulted in a major shift in the amount of power that they wield in both the economic sector and the marketplace of ideas. Baker asserts that the FCC abandoned its traditional concern with structuring media ownership to support democratic society to a paradigm that almost exclusively focused on "making media more responsive to the demands of commodities."⁷⁶ It is from this ideological perspective that the supporters of deregulation and the FCC allowed radio to become an "oligopoly" through deregulation of the Telecom Act.⁷⁷

The FCC expressed concern that further consolidation could threaten competition in local advertising markets. The Commissioners drew on commentary from both sides of the debate to support their ultimate decision to maintain existing local radio ownership rules. The Commission also cites data from the BIA database (1999) that two corporations (Clear Channel and Viacom) have significant control over advertising revenue in most radio markets, suggesting that deregulation has in fact decreased competition.⁷⁸ According to the Department of Justice (DOJ), radio's advertising market is a distinct market from other media, such as television and newspaper for a "significant number of advertisers," therefore the FCC and the DOJ both have antitrust concerns about the adverse effects of consolidation in the radio advertising markets on those advertisers who rely heavily on radio. Specifically, the commission cited data from Americans for Radio Diversity (ARD), which stated that the price of radio advertising has skyrocketed at triple the normal rate of inflation, making it difficult for owners of small businesses to afford radio advertisement. Believing that Pre Telecom Act ownership rules no longer fostered healthy economic competition for radio, supporters of deregulation argued that repealing radio ownership rules, was necessary to relieve the "severe economic strain" placed "on small to mid-sized radio companies" and to help the then financially struggling radio industry. Gains in economic viability must, however, be weighed against losses in competition.

Those opposed to deregulation find that market economics should not be the primary component of the FCC's regulatory approach to media because the media is not democratically controlled. Yet, it has tremendous power over public discourse, politics, and culture.⁷⁹ Baker finds that though the DOJ antitrust guidelines are "logically defined" and "calibrated" to spot mergers in any market where such mergers would result in excessive control over prices by one firm, he points out that application of the rules is far from a science. One of the problems with the economic approach is defining the product and the marketplace. He points out that the FCC has held for the past 20 years that "all information and entertainment media are part of the same product market," while the courts and the DOJ have held that they are separate.⁸⁰

Conclusion

The Telecommunications Act of 1996 heralded radical deregulation for the purposes of increased competition and to provide consumers more innovative technologies. In roughly a decade since its passage, American radio listeners have had access to more radio formats but less programming variety. They are experiencing the reality of "creeping sameness" in their local radio formats.⁸¹ This brave new world of radio is the by-product of the economies of scales benefit that allows radio owners to consolidate their facilities and to own more stations

for improved efficiency and profit. In addition to less programming diversity, radio ownership decreased 33 percent over five years. Included in that number, is a decrease in minority owners who are struggling to compete with their consolidated non-minority counterparts. Minority owners are experiencing entry barriers such as the high cost of doing business in this new oligopolistic economic environment. The end result is radio that is less diversified and therefore less democratic. The television industry is moving in a similar direction. The one factor that might account for the consolidation lag in television is its current 39 percent national audience reach cap, in contrast to radio, which has none. In short, the Act has produced less competition and less diversity.

Democracy happens when the public is informed on the local level. It happens when citizens read newspapers, hear radio, and watch television programs that are relevant to their daily lives in their local communities. The move toward consolidation in media has the effect of centralizing and nationalizing information and entertainment. This format would work well if American democracy was based on either pure majority or pure minority rule, but this is not the case. American democracy by design is about majority rule with minority representation to stave off the potential tyranny that can occur with pure majority rule. Supporters of deregulation contend that the changes were not enough. For them, ownership concentration is the most efficient way of doing business. They contend that in today's competitive marketplace, consumer interests, and tastes should ultimately drive business. The ownership of media outlets by large multinational corporations has made them increasingly concerned with profitability and less beholden to the public interest. The 1996 Act has facilitated media concentration under a few large firms with the concurrent effect of decreased diversity of viewpoint and diversity of outlet. The Telecommunications Act of 1996 has provided Americans with more technologically advanced news gathering equipment, more radio formats, more entertainment choices and more news coverage all of which are controlled by fewer owners and producers.

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Burning Down the House: Scorched Earth Tactics Suggested by Wace and Bayeux Tapestry

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Edward the Confessor, king of Anglo-Saxon England, died on January 5, 1066. In spite of taking an oath that William, Duke of Normandy, should be king after Edward, Harold Godwinson crowned himself king the next day. Harold's reign lasted nine tumultuous months during which time he defeated an army led by his own brother, Tostig, who was also contending for the throne. Harold's reign ended on October 14th when he was killed at Hastings while leading his army against William and the invading Normans. William's victory and the subsequent establishment of Norman rule is an important watershed in English history for a number of reasons. It tied England more closely to Continental Europe and away from Scandinavian influence, created one of the most powerful monarchies in Europe, created the most sophisticated governmental system in Europe, changed the English language and culture, and set the stage for a long future of English-French conflict. It remains the last successful military invasion of England.

Of the several surviving accounts of the Norman Conquest, Wace's *Roman de Rou* and the Bayeux Tapestry (created by persons unknown) have several interesting connections. The Tapestry was created around 1077, and though Wace's work was written about 100 years later, probably between 1155 and 1170, both works give similar, if not identical, accounts of the battle of 1066 and the events leading up to it. Wace may, in fact, have used the Tapestry as a source.¹¹ These two accounts are the only ones to substantiate Harold's oath that William should follow Edward as king, at Bayeux. One of the most interesting connections between the two, and the focus of this paper, is that both suggest the English may have burned their own homes and fields to prevent the Normans from using their resources. Though Wace claims such scorched-earth tactics were only recommended, not used, the Tapestry appears to show the actual burning taking place. Though a historical precedent or literary source for this idea remains unidentified, that both Wace and the Tapestry allude to this practice suggests such a source existed and was known to both.

Around the 1160s, probably at the instigation of Henry II, Wace began writing his *Roman de Rou*, a chronicle of the Norman kings in England, beginning with William. In it he describes the marshalling of the Norman forces, the voyage across the Channel to England, the battle itself, and a scene in which William arrived in England and began preparing for battle. Harold, however, has just fought a battle in the North, defeating Tostig. Upon learning that William had come to contend for the throne, Harold must march 57 miles south to engage in yet another battle. According to Wace, Harold was gathering his forces in London and preparing to leave to engage William. He was at council with his advisors when his brother Gyrth recommended that Harold stay there while Gyrth ride ahead to do battle with William. Should Gyrth fail, Harold could make a second attempt at war or diplomacy. This is not all Gyrth suggests, however:

*Go through this land setting fire to everything, destroying houses and towns, capturing booty and food, swine, sheep and cattle, so that the Normans cannot find any food or anything off which they can live. Get the food a long way away so that they cannot find anything to eat; in this way you can frighten them greatly, and the duke himself will leave since his food will run out.*²²

In short, Gyrth specifically recommended to his brother the practices of scorched-earth.

The possible explanations for this ruthless suggestion by Gyrth are several. One obvious possibility is that Wace, sympathetic to the Normans, attributed dubious war-time ethics to the English. Burgess, Keller and many others have contended that the *Roman de Rou* is a piece of Norman propaganda.³³ Yet this scene with Gyrth certainly does not substantiate this viewpoint, for Wace states that not only does Harold refuse to follow his brother's advice, he nobly repudiates the questionable ethics of such an action: "'How,' he said, 'could I harm the people it is my duty to govern? I must not destroy or harm the people to whom I owe protection.'"⁴⁴ Harold appears as a magnanimous leader, not a ruthless tyrant.

What further attests to the importance of this passage is the possible affirmation of the use of scorched-earth tactics in the Bayeux Tapestry. Unlike Wace's chronicle, in which the burning is recommended but not carried out, the Tapestry depicts the actual burning of a house in scene 47. Traditionally, this scene has been read as the burning of the countryside around the invasion site by the Normans. There are, however, convincing reasons to consider that the Tapestry depicts here not Norman soldiers, but English soldiers using scorched-earth tactics.

Before considering the case for the English as the perpetrators of the burning, it is important to consider what arguments and suppositions underlie the traditional view that attributes these actions to the Normans. David C. Douglas and Antonio Santosuosso posit that William burned the surrounding countryside to force Harold's hand (Douglas 196, Santosuosso 158). William knew Harold had made a forced march to meet the Viking threat in the North and had fought a great battle there. It stands to reason that, if William did in fact know this, the sooner the battle was fought the more it would favor the stationary Normans. Another forced march would fatigue the English further as well as prevent them from raising forces to replace those lost in the battle against Tostig. William, this argument goes, attempted to force Harold's hand by devastating the countryside.

Although one might posit that the burning was the result of spontaneous violence on the part of the Norman troops, William had a steady record of maintaining strict discipline among his men before, during and after the battle. William of Poitiers asserts that once William's force was assembled and awaiting departure to England, such discipline kept a huge fighting force from pillaging the surrounding Norman countryside. During the Battle of Hastings itself, the invaders won largely by feigned retreats to draw the enemy from their ground, a tactic requiring a great deal of discipline from the cavalymen (Douglas 203-204, Santosuosso 164). After the battle, William's reign was characterized by a firm hand, even to such extent as the ruthless displays of force in the "Harrying of the North." All of these points argue against the possibility that William's men propagated the burning.

Even considered from a purely tactical perspective, however, there are many reasons suggesting the Normans would not have burned the countryside. As mentioned above, it has been suggested that burning the countryside around the invasion site would force Harold to rush into battle. However, William would have known that Harold would be foolish to race his army to Hastings, further fatiguing them, simply to rescue one small region. There is little reason to think Harold would have risked a kingdom to save a district. Further, the Norman army could not be reinforced or supplied from Normandy. Therefore, if the Normans had

devastated the countryside, they would have also destroyed much of their access to food and shelter. Harold would have been able to have simply kept them pinned against the sea while continuing to gather his own forces, harassing the Normans with sorties until, weakened by losses and hunger, they could be forced to negotiate a peace. Aside from Wace and the Tapestry, no other reliable account of the Battle of Hastings claims that burning was used by either side. Wace mentions it in connection with only the English. The Tapestry, then, becomes the only possible primary source of the notion that the Normans burned the lands of England.

As the only source that directly demonstrates burning taking place prior to the Battle of Hastings, the Tapestry itself indicates that the English committed the act. In scenes 39 and 40, the Normans have landed in England. In the following scenes they are shown securing food and holding a feast. Next, in scene 45, defenses are constructed. In the following scene, William is shown listening to the report of a messenger who brings news, as the inscription tells us, of Harold. The inscription on the next scene, scene 47, simply states that a house is being burned. Two men with torches are setting fire to a home as a mother and child, hand-in-hand, flee the devastation. This scene has traditionally been interpreted as showing that the Normans set fire to at least one English home, and possibly the entire countryside. However, it is far more likely that the scene actually shows William hearing news of English burning.

From scene 33 to 51 the entire flow of the narrative is made up of a sequence of events leading up to the attack. The fortifications are built, the house is burned, and in the very next scene, the ride to Hastings and battle is ordered. If this event is to be understood as the depiction of the Normans burning in order to force Harold's hand, as some have suggested, it should have been placed much earlier in the chain of events leading up to the attack. The way it stands, following this interpretation, the events are presented in an illogical order: fortifications are built and all seems ready, William waits on and receives news of Harold's movements, Norman soldiers burn the countryside, and without any other event taking place, the attack is undertaken. It seems unlikely that the tapestry would present events out of order unless for a specific function. As will be discussed below, there are two instances, here with the burning house as well as the scenes preceding Harold's coronation, where the Tapestry reverses chronology in order to indicate to the viewer that a "reported discourse" is being shown. Rather than assume the scene has been placed out of order by mistake, it is more likely that William, learning from his messenger that the English have begun burning the surrounding countryside and threatening his army's food supply, immediately rides to the attack.

It should be noted here that, due to the placement of this scene in a section depicting the Normans' movements, some have interpreted this to mean scene 47 also shows the actions of the Normans. Yet a more accurate expression would be that this section of the Tapestry, from scenes 33 to 51, is presented from the Norman point-of-view. These scenes show nothing of Harold's movements or councils. If the messenger here is bringing news of the English to William, the only way to show what that news was would be with this type of imagery. Additionally, the clothing of the perpetrators is nearly identical to other depictions of both Normans and English in other parts of the Tapestry making the identity of the soldiers unclear. The details of the home, mother, and child suggest nothing either way as they would have been English in any case. Scene 47 is the Tapestry designer(s)' visual depiction of the reported movements of the English.

Recent scholarship on the treatment of the passage of time in the Tapestry provides some further insight into scene 47. While the scenes in the Tapestry nearly always proceed approximately left-to-right in chronological order, several do not. Stenton has theorized that these instances are most likely simply mistakes by the embroiderers.⁵⁵ This would seem to be

an unsatisfactory explanation. In another sequence, scenes 9-12, there is a similar reversal of order which is often dismissed as a reversal of the cartoon by the embroiderer. Yet, François Neveux offers a much more acute observation, noting that the sequence in scenes 9-12 seems quite clearly to be “an entirely deliberate composition on the part of designer and artist” (191). Neveux explains in detail how what appears to be an accidental inversion is actually a way of refraining from devoting too much space to this episode. Neveux notes that a similar artistic device is used again in scene 18 (192).

One example of this type of complexity, Edward’s death scene, shows how the interruption of left-to-right chronology helps the reader interpret the scene. Scenes 26-28 show Edward’s last words, death, and burial. Yet the entire sequence is shown in reverse chronological order. Is it simply a mistake? Like Neveux in the case of scenes 9-12, J. Bard McNulty says it is, rather, a deliberate artistic device. This scene, in which two large buildings make a definitive boundary creating a sense of discourse as reported by the messenger, is reversed to achieve a very specific effect (McNulty 16-18). In the next scene, a messenger, clearly pointing back toward the death scene, tells Harold of Edward’s death. Harold is crowned king, and in the next scene the comet, which portends some great disaster, is observed by several figures. Two scenes later, William begins building ships for the imminent invasion. When seen in context of the surrounding scenes, the Tapestry recounts the events in the following order: Harold is told of Edward’s death, he takes the crown despite the reminder of Edward’s last words, then the omen appears, foreshadowing the trouble which will befall Harold. In the next scenes, William prepares for (what the viewer would have known was) the conquest of England.

There are several clues suggesting that the scenes of Edward’s death were never meant to be read strictly chronologically, but rather interpretively. The first is the way they are set off with the heavy buildings on either side, creating a narrative barrier, and that the only time reversal comes within this “bracketed” section (McNulty 48). Second, Edward sits up in bed and delivers his final words in the upper room of the building, then is shown lying dead in the lower. Clearly no one could take this to mean that Edward was physically present in two rooms at once. This alone is enough to indicate to the viewer that the scene must be interpreted, not just read. The third and most significant reason, as McNulty points out, is that by reversing the scene, the messenger points back, not to the burial site, which would be the case if the scene read left-to-right, but to Edward’s dying words (18). According to Wace, Edward’s final words included the statement, “I have given my kingdom after my lifetime to the Duke of Normandy; what I have given him some of you have sworn to him on oath” (225). This is a direct reminder to Harold of his oath at Bayeux (present in the Wace and Tapestry accounts) that William should be king after Edward’s death. By reversing the scene, the messenger is not merely referring to Edward’s death, but pointing directly to Edward’s last words – he is warning Harold of the impending disaster if he should seize the throne, break his own oath, and violate Edward’s wishes. In short, he risks severe consequences.

If this same technique for representing reported discourse is being used in the scene of the burning house, the Tapestry asserts that the English were in fact practicing scorched-earth tactics. The same reversed chronology appears again in this scene. As in the scene recounting Edward’s death, the burning house scene is bracketed with large buildings on either side. The messenger here is reporting to William about the movements of the English, and the scene with the burning house shows the movements of the English.

What indicates a discourse here is not only the reversed chronology within “brackets” but also, as McNulty observes, a linking ground line between the two scenes (48-49). This ground line indicates that the two scenes are related. No other ground line in the Tapestry runs

unbroken between two separate scenes; the unbroken ground line appears only within scenes that are to be read as one event. The use of the unbroken ground line in the house-burning scene must be read as the depiction of a single event. Moreover, a single line of stitching that forms the messenger's spear is the only separation between the two scenes, and this line is broken by the messenger's scabbard, his foot, and by two of his fingers which point toward scene 47. The inscription, too, extends past the spear. Interestingly, the gesture the messenger is making, with the last two fingers of his hand, is not found elsewhere in the Tapestry, though many other characters point with their index fingers. Although the character is not pointing with his index finger, his gesture creates the same connection to the reported scene as the figure who points to Edward's dying words.

It is necessary to make a distinction here between interpreting what the Tapestry depicts and what actually took place. As McNulty says, "the question relevant to these scenes in the Tapestry is not what actually happened but what the designer wished the observer to understand had happened" (48). In order to accept this reading of these scenes, it is not absolutely necessary to reconsider whether the Normans burned the countryside at all, only whether the Tapestry provides any evidence of it. However, that both Wace's chronicle and the Tapestry suggest scorched-earth raises the question of whether such tactics were used in this context. Research as to whether this may have actually taken place seems to be lacking. Among military historians, it is generally held that this practice was not being used in Western Europe at this time.⁶⁶

It could be argued that there is no historical event that provides a basis for this reading and that the Tapestry is a pro-English document, therefore portraying the ruthless invaders burning homes and turning out women and children. However, Gale Owen-Crocker notes that the naming of Stigand at Harold's coronation implies an anti-English view.⁷⁷ In fact, the events in the Tapestry are depicted primarily from the Norman point of view. Harold is shown as a traitor, first taking an oath to allow William the uncontested ascension to the throne at Bayeux with his hand on religious reliquaries, and then breaking that oath. Furthermore, Harold's being shot through the eye, rather than dying in mounted combat, is a less than heroic depiction of the king's demise. In any case, a simple anti-Norman bias is not sufficient to explain why both Wace and the Tapestry designer depict a military tactic believed unlikely during the time period.

Vegitius's *De Re Militari*, and the writings of Peter Abelard, who Keller contends had an influence on Wace's writings, offer nothing to elucidate the source of the idea of scorched-earth to Wace. Although Wace's chronicle and the Tapestry differ on whether the event in question actually took place, Wace's account denying and the Tapestry affirming that it did, they both offer up evidence that such tactics were being used, despite the absence of any other source or record. Why do Wace and the Bayeux Tapestry designer(s) agree on the same idea, even if differing on whether it was actually carried it out? Can there be some actual incident that took place that both are drawing from? Whatever the source of these two accounts, there is strong evidence to reconsider the practices of scorched-earth in the context of the Norman Conquest.

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Endnotes

1. Wace. *Roman de Rou*. Trans. Glyn S. Burgess. St. Helier: Société Jersiaise, 2002. p. xxxiv.
2. Burgess, 249 (Wace lines 6927-6938).
3. Keller, Hans-Erich. "The intellectual journey of Wace." *Fifteenth-Century Studies* 17 (1990), pp 185-207. See also Burgess.
4. Burgess, 249 (Wace lines 6945-6948).
5. Stenton, Frank. *The Bayeux Tapestry: A Comprehensive Survey*. London: Phaidon Press, 1957.
6. Douglas, Santosuosso, and Philipe Contamine all note the use of the *chevauchée*, a fast-moving, destructive raid often including burning. However, none of these suggest the use of actual scorched-earth tactics until at least the thirteenth or fourteenth century.
7. Owen-Crocker, Gail. "The Scene of the Unseen: The Role of Text in the Bayeux Tapestry." Presented at the 40th International Congress on Medieval Studies, Kalamazoo: 2005.

M Pivot Sort – Faster than Quick Sort!

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Abstract

M Pivot Sort (or Multiple Pivot Sort) is a new comparison-based sorting algorithm that has been developed to address shortcomings in current popular comparison-based sorting algorithms. The goal of this work is to perform an extensive empirical study of M Pivot Sort against other established sorting algorithms including Quick Sort, Merge Sort, and Heap Sort. This research presents data to support the hypothesis that M Pivot Sort is an extremely promising new algorithm in a critical field of computer science. The empirical study includes comparisons of the various sorts using randomly generated arrays of size 10 data items up to 1 million or more data items. In addition, integer arrays in which the data is in order and in reverse order are used in the study. Data items include integers, strings, and classes. The study keeps track of the number of comparisons, the number of data moves, and CPU time specific to the machine for each sort. Results of the empirical study performed in this research support the claim that M Pivot Sort may well be the fastest sorting algorithm in existence.

Introduction

Sorting algorithms are the basic foundations of practical computer science, and consequently, the analysis and design of useful sorting algorithms has remained a priority in the field. However, despite the introduction of several new algorithms such as Three-Way Radix Quick Sort, LSD Radix Sort and Multikey Quick Sort, the majority of programmers in the field rely on one of the three staple comparison-based sorting algorithms: Quick Sort, Merge Sort, and Heap Sort. The new algorithms are generally not being used as much because they are not as general purpose as comparison-based sorts, usually require more tweaking to work with new classes and data types, and in most cases, do not perform as well as expected due to poorer locality of reference caused by linear passes through the array.

For a new algorithm to be accepted and used in the field of computer science, the method must be shown to have comparable performance to the aforementioned sorting algorithms and be easy to use, implement, and debug. Comparable performance will arouse programmers' interest in the algorithm, and ease-of-use will be the final determinate in changing programmers' sorting preferences. The easiest, most time efficient way to accomplish a task is usually preferred, and the comparison-based sorts highlighted here offer excellent performance and adaptability to any type of record or data type to be sorted.

Quick Sort, Merge Sort, and Heap Sort have been around for more than 40 years and have been taught widely in the academic computer science community. These algorithms are established and well-documented with literally dozens of thousands of published empirical analyses comparing and contrasting performances, highlighting theoretical boundaries, and recommending preferred solutions. This paper is no different in this respect. However, this paper does divulge new information on a newly developed comparison-based sorting algorithm

based on the partitioning scheme implemented in Quick Sort, and this algorithm has shown amazing promise by being able to meet and beat Quick Sort, Merge Sort, and Heap Sort in their own ideal sorting situations.

M Pivot Sort, also referred to as Multiple Pivot Sort or Pivot Sort, is a new in-place, comparison-based, sort that was developed by the author in late 2004 and early 2005. The algorithm accomplishes sorting by grabbing a large sample of the array and isolating the sample by swapping it with records at the end of the list of records. Once the sample has been moved to the end of the list, the sample is sorted with Insertion Sort (an algorithm that works very well on lists smaller than 16 elements) and pivots are passively selected at locations that guarantee a partition of at least one record between the pivots. The list of records is then partitioned around the pivots (*i.e.*, lesser records are placed before the pivots and greater records placed after). Also, the algorithm calls for comparing pivots for equality and if found to be equal, placing all equal records remaining in the list between the two equal pivots, which solves a major problem with Quick Sort on lists with large numbers of duplicates. More information including a formal algorithm definition may be found in reference [4].

The basic outline of M Pivot Sort is as follows:

- 1.) Choose 7-15 equidistant pivot candidates from the list.
- 2.) Isolate these pivot candidates by moving them to the end of the list.
- 3.) Sort these pivot candidates with Insertion Sort.
- 4.) Passively select 3 to 7 pivots starting from the second sorted candidate and every other candidate.
- 5.) Partition the list around the pivots.
- 6.) Recursively call M Pivot Sort on any partition with more than 15 elements. Call Insertion Sort on any partition with 2-15 elements.

The following diagrams outline the major processes visually.

Figure 1. Pivot Candidate Selection with 3 Pivots (25 elements)

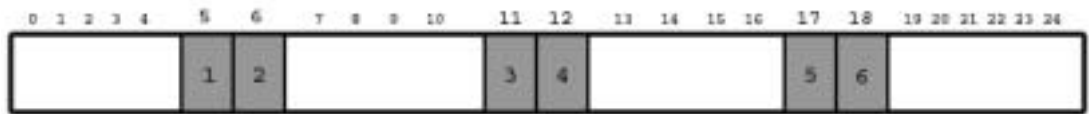


Figure 2. Pivot Selection with 3 Pivots (25 elements)
P denotes a pivot

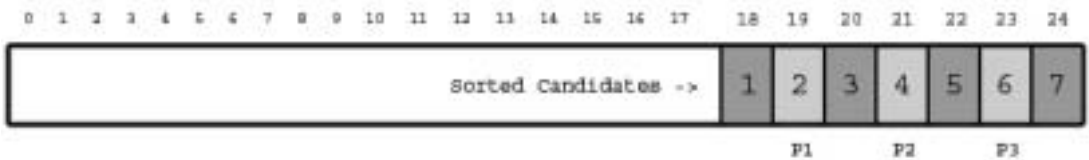
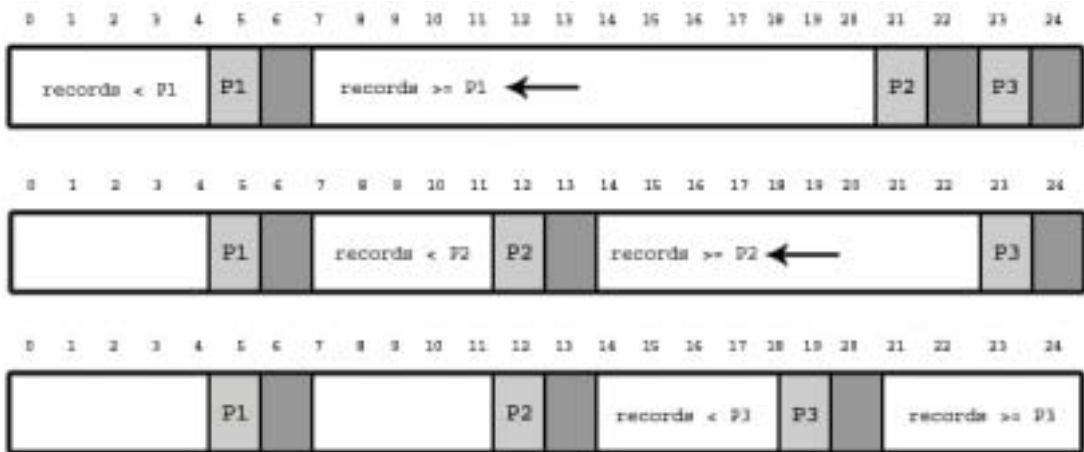


Figure 3. Partition Steps with 3 Pivots (25 elements)
P denotes a pivot



The empirical study conducted here analyzes the performance of Quick Sort, Merge Sort, Heap Sort, and Pivot Sort on near unique random lists of integers, strings, and a simple class of four string members as well as an ascending and descending list of integers, all of which are situations the former three algorithms are known to handle well. Two different methods for choosing pivots in Quick Sort are included in these tests: the Median-Of-Three method (which does not use random selection because these are known random lists) and a simple pivot selection of the middle element of the list. All of the algorithms included are easy to implement and change for different data types and they perform in $O(n \log n)$ time, which has been shown using decision trees to be optimal [3]. Of the three established algorithms, Quick Sort is known to be the fastest average case performer, and that is why the title of this paper is specific to that comparison.

Analysis

Sorting algorithms are usually ranked by numbers of data comparisons and moves, and the theoretical marks of Quick Sort, Heap Sort, and Merge Sort are well documented. On average, Quick Sort performs very close to optimum in comparisons at about $2n \log n$ [8]. Merge Sort requires just slightly more comparisons than optimal and performs just above $n \log n$ consistently on any data set [8]. Heap Sort performs between $2n \log n$ and $3n \log n$ comparisons [8]. With these figures in mind, Merge Sort would appear to be fastest. However, comparisons are not the only gauge of speed, and Quick Sort proves more efficient due to fewer average data movements, a very efficient partitioning scheme, and better locality of reference from not having to use an extra array.

M Pivot Sort is a new algorithm that has received very little theoretical analysis. However, the worst case for comparisons and moves is known to hover around $n^2/4$, roughly half the worst case of Quick Sort, due to a worst case of partitioning two records into order at a time rather than Quick Sort's one. Based on many empirical tests, the average case performance for M Pivot Sort is 20% more comparisons than Quick Sort, but Quick Sort performs roughly 50% more data moves. Both data moves and comparisons hover at the $2n (\log n)$ mark, which is in contrast with the other three algorithms – all of which perform significantly more data movements.

M Pivot Sort's partitioning strategy is strengthened by the Strong Law of Large Numbers. Because sample median is considered to be an unbiased estimator and variance of sample median decreases as sample size increases, the Strong Law states that taking a larger sample size will produce a statistic closer to the actual population median, on the average. This correlation was incorrectly stated in a previous paper [4] as falling in line with the Central Limit Theorem.

M Pivot Sort's performance is also increased because it attempts to do more work per sample by placing pivot points throughout the sample and performing more partitions per level than Quick Sort. This results in three optimal cases for M Pivot Sort. The first case involves having every sample partitioned exactly like Quick Sort; *i.e.*, after partitioning, the first pivot would end up at the $\frac{1}{2}$ mark, the second pivot would end up at the $\frac{3}{4}$ mark, the third pivot at the $\frac{7}{8}$ mark, etc. This case is extremely rare and has never been observed in any tests on random data. The second optimal case occurs when the partitioning phase results in equal partitions between each pivot. This special case for M Pivot Sort can be observed in the ascending and descending list tests (also the optimal case for Quick Sort). The third optimal case for M Pivot Sort occurs when the list is composed entirely or nearly entirely of duplicates. Because M Pivot Sort may be programmed to compare pivot values for equality and partition around a second equal pivot differently (by moving equal elements between the equal pivots), M Pivot Sort performs sorting in linear time. This case may be viewed by sorting a list based on a Boolean value such as gender (male or female). Quick Sort's performance on such lists quickly approaches $O(n^2)$ unless using a modification such as Bentley's three-way partitioning strategy [7].

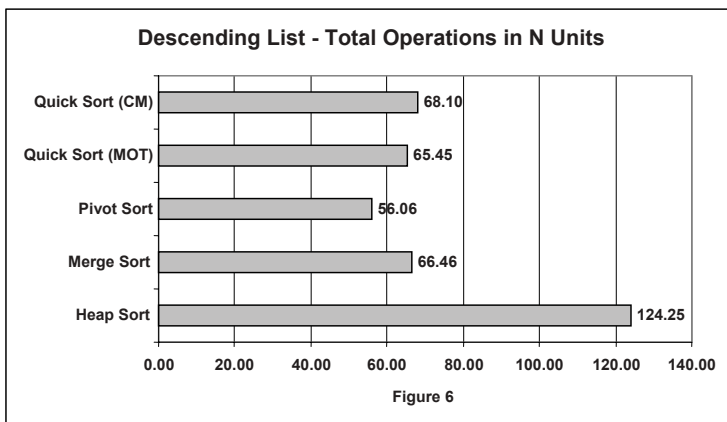
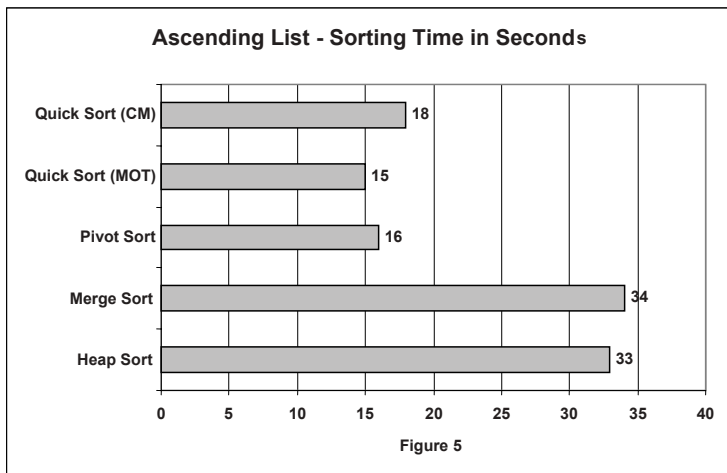
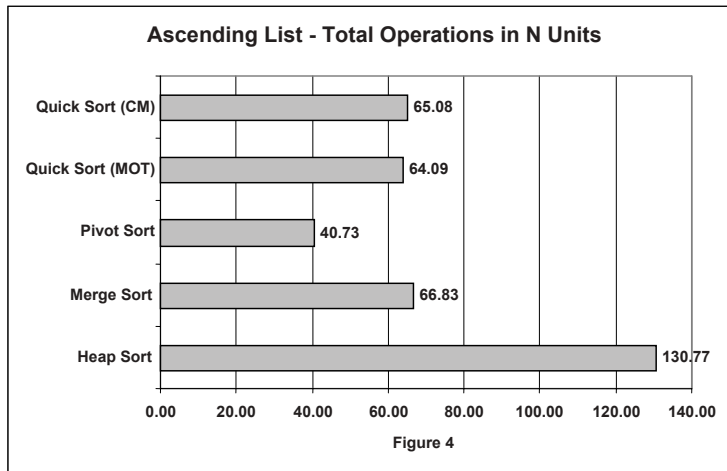
Another feature of M Pivot Sort that complicates a thorough analysis is the ability to adapt and correct performance problems at runtime. Such a feature was not implemented in the code base for this testing suite as it wasn't necessary for the types of tests performed here. However, in a real database situation, M Pivot Sort could be tweaked to check the final partition locations of the pivots and change the next level of sample size by simply changing the number of pivots to be used. This is in sharp contrast to Quick Sort which has no runtime policies to correct poor performance.

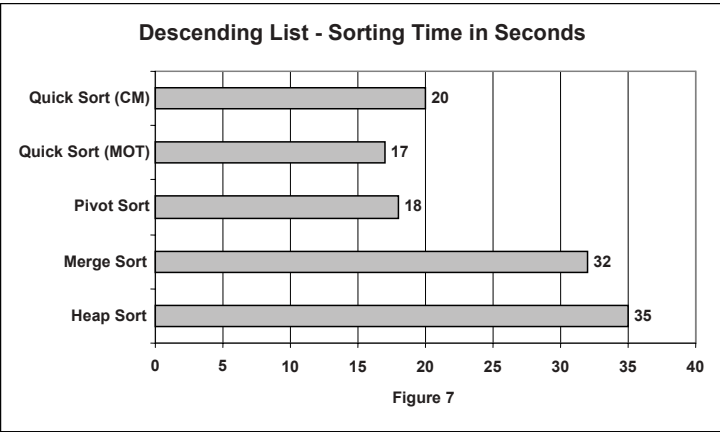
Testing

All testing was done on a quad Xeon server with two GB of RAM running Windows 2003 Server Standard Edition. The testing suites were produced with Visual Studio.Net as C++ console applications. The strings tested were ANSI C++ strings available in the standard library. All graphed results are mean averages produced from 10 runs of each sorting algorithm on the same 10 data sets.

The goal of these tests is to determine M Pivot Sort's performance in comparison to Quick Sort, Heap Sort, and Merge Sort. Merge Sort was implemented in top-down fashion as was Heap Sort. Two different pivot selection versions of Quick Sort were tested: the Median-of-Three method and a method that simply chooses the middle element of the partition as a pivot. As Quick Sort is generally considered the fastest general-purpose, comparison-based, sorting algorithm, M Pivot Sort is primarily compared to it. Both versions of Quick Sort perform better than the implementations of Heap Sort or Merge Sort.

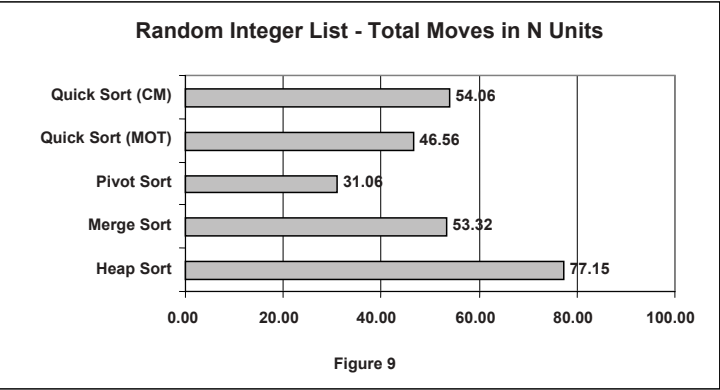
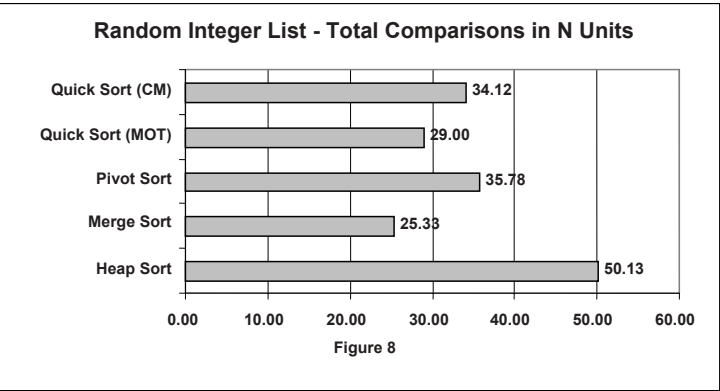
The first tests demonstrate performance on common patterns (ascending and descending lists) and are shown in Figures 4 through 7. These types of sorting operations are performed quite often in databases when either reversing the order of a list or just making sure that a list is sorted. Tests were performed on ascending and descending lists from sizes 10 to 100 million integers. However, only the results of the tests on 100 million integers are reported here for the sake of brevity, conciseness, and readability.

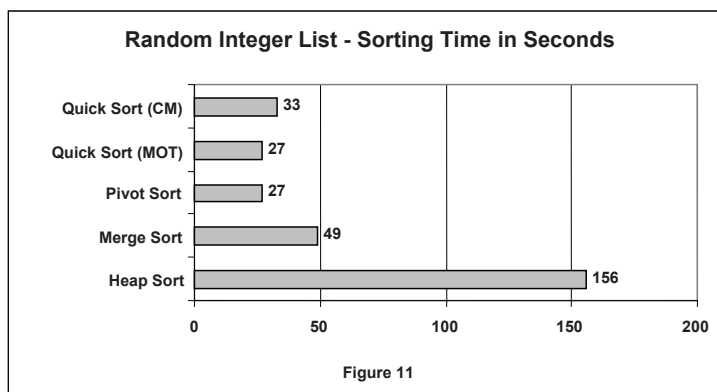
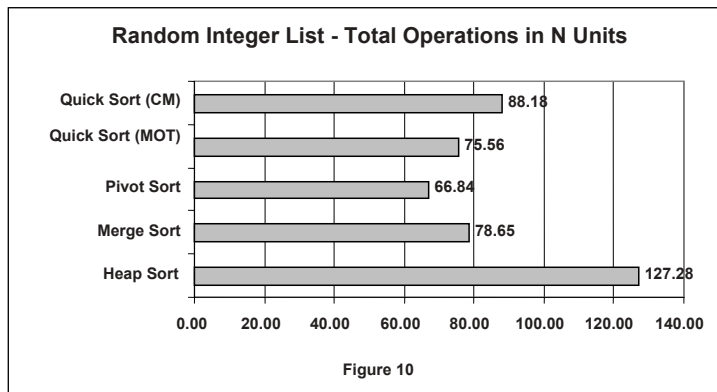




These kinds of sorts are Quick Sort’s optimal scenario, and no other sort beats it, but M Pivot Sort comes close – finishing only one second later on both ascending and descending lists. Sorting performance on ascending and descending lists is not a major influence on algorithm selection, so will be elaborated here, but these tests do show that M Pivot Sort performs very well on these common database operations.

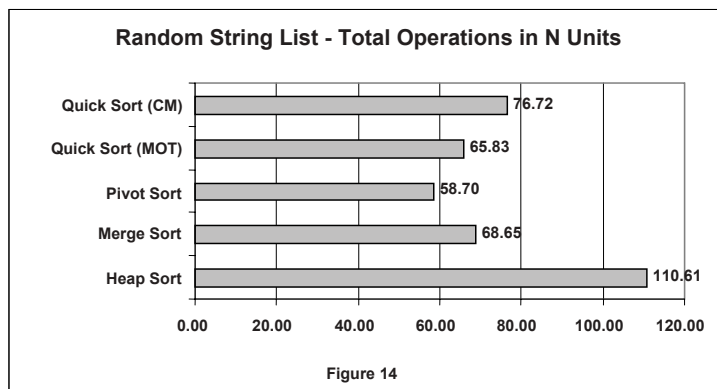
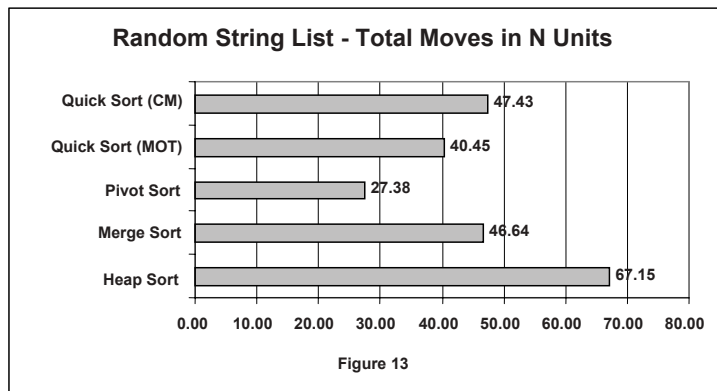
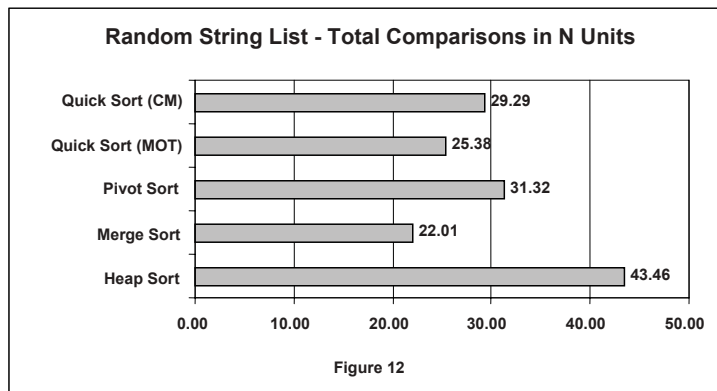
The next tested scenario is much more practical. The following tests were performed on lists of 100 million near unique random integers, and the results are shown in Figures 8 through 11. The random integer generator was written by Andy Thomas [9].

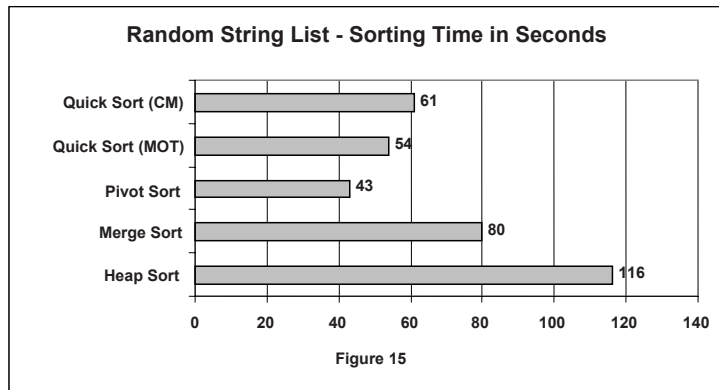




Again, Quick Sort has been thoroughly noted by academia to perform near optimal data comparisons on near unique lists. However, M Pivot Sort again shows its worth by meeting Quick Sort's results in time completion and performing less total data comparisons and moves. More tests on integer lists between these sorting algorithms may be found in reference [4], including tests on lists of duplicates in which Quick Sort performs poorly. See the analysis section for more information about Quick Sort's performance on duplicate records.

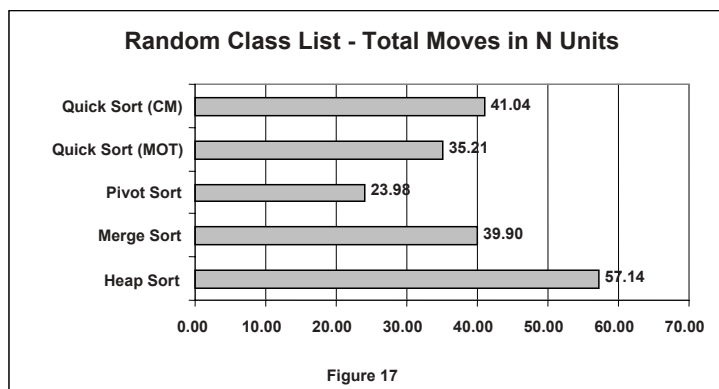
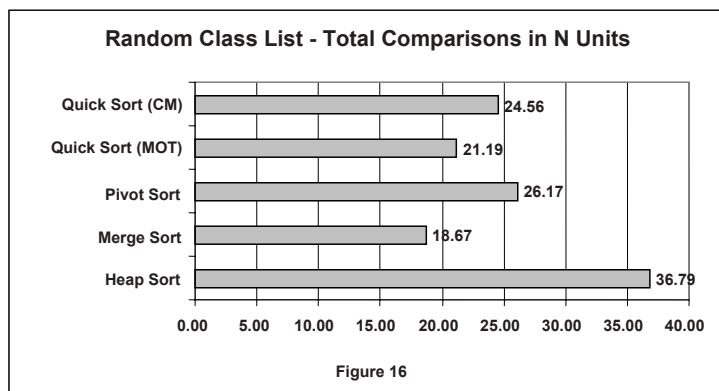
The next series of experiments gauge each algorithm's performance on lists of randomized strings, and the results are shown in Figures 12 through 15. These tests are of immense practical importance, as a large proportion of sorting operations are done on text. Each sorting algorithm was tested on a list of 10 to 10 million randomly generated strings of 4 to 19 characters. Only the results of the tests on 10 million strings are reported here.

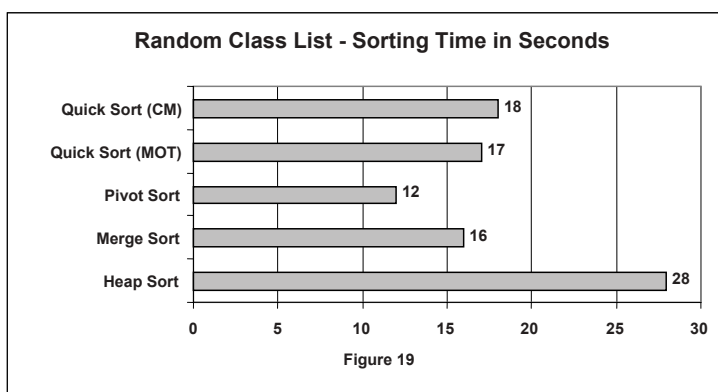
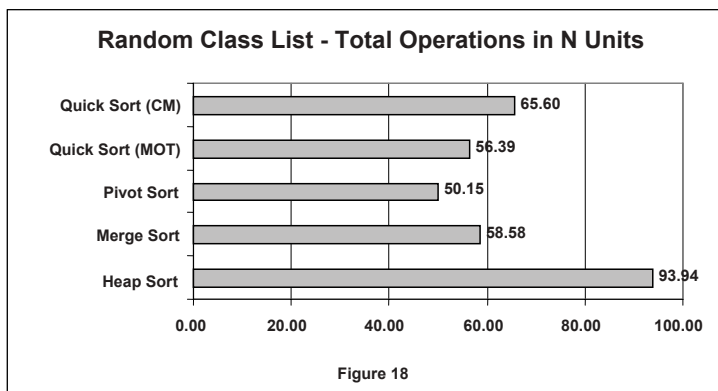




3M Pivot Sort performs better than the other sorting algorithms in these tests because M Pivot Sort averages far less data movements. When dealing with larger classes like strings, the data movements performed weigh more heavily on algorithm performance than an equivalent number of data comparisons.

The final series of tests were performed on lists of one million randomly generated classes, each containing four string members of 7-17 characters. The results of these tests are shown in Figures 16 through 19. This type of situation is commonly found in most databases, such as an accounting database of customers.





As noted in the string tests, M Pivot Sort's ability to minimize data movements results in better performance on large classes in contiguous array settings. The performance gap only increases as the size of the array grows larger. Many databases attempt to overcome this problem by converting the contiguous array into a queued list and converting data movements to pointer arithmetic, but this requires memory (in this case it would mean four extra megabytes of RAM).

Conclusion

In a previous paper [4], M Pivot Sort is shown to perform faster than Quick Sort, Heap Sort, and Merge Sort when duplicates are present. The empirical study conducted in this paper shows that M Pivot Sort meets or beats these same established sorting algorithms in unique random lists including strings and classes. As demonstrated in the string and class tests, M Pivot Sort uses fewer moves and consequently should be preferred in situations where contiguous lists of large data structures are being used. Combined with excellent performance on ascending and descending lists and less total operations, these factors make M Pivot Sort a viable general-purpose sorting algorithm for all types of databases.

Acknowledgements

The author would like to thank Dr. Lisa Green for pointing out the issues with applying the Central Limit Theorem to a problem with medians involved and for her guidance towards using the correct statistical laws and models for this research. Special thanks also go out to friends and family for their support, the MTSU Ronald E. McNair Program for its funding and sponsorship, and Dr. Judy Hankins for her oversight, counsel, and friendship.

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Rock & Roll Screenprinting: A Focus on Women Poster Artists

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The genre of screenprinted concert posters has been revived and is thriving due to the increasing popularity of independent, "do-it-yourself" rock artists. The ability to present a unique and appealing public image is one reason screenprinting holds an advantage in rock-and-roll publicity and promotion. A primary goal of a rock group is to reach a younger audience which has an interest in attending live performances and purchasing recordings. Over the past fifteen years, rock & roll artists have been increasingly aware of screenprinting as a means of communication, recognizing it as a superior choice in promoting a performance. Engaging, colorful posters, which are works of art in themselves, have a visceral appeal. Hence, many screenprinters' work is in demand. Regrettably, although female screenprinters are equally as talented as their male counterparts, their work is still under-represented in this small, relatively unknown artistic sub-genre. This paper identifies various women screenprinters and discusses some of the obstacles that they have endured in the profession.

Women Artists and Their Role in the Rock & Roll Screenprinting

Women screenprinters have entered the profession through various means. Some of these women artists have entered into rock & roll screenprinting by virtue of their membership in a band (Bell, personal communication, June 17, 2005). Others have done so because people close to them have recognized their talent. Friends and family will ask these artists to screenprint posters for their band, invitations for their party, or any event they think could use the catchy look that screenprinting provides¹.

Although people rely on them to produce art, female screenprinters do not always receive monetary compensation for their work. Historically, female artists earn one-third the salary of male artists (Guerilla Girls, 2005). This pattern appears to hold true for female screenprinters as well. Based on my observations as a participant in the rock & roll and screenprinting genres, women screenprinters often receive so-called financial compensation through bartering, offers of free beer, and an invitation to join a guest list membership at rock shows.

The Origins of Screen Printing

The origins of screenprinting shed some light on understanding the printmaking process and how women became involved in using this art form to create rock & roll themed screenprints. In 1877, the process was originally used for duplicating office paperwork. It was an effective medium because of its ability to mass produce images. The medium was further developed by David Gestetner, who originated the use of a silk diaphragm covering an apparatus with a hinged frame. With this silk covering, ink could be rolled onto a surface through the stencil (Turner, 1996). In the 1930s, Guy Maccoby used screenprinting to create the first artist's screenprint

in America (Turner). In 1938, screenprinting was highlighted as a significant art form with the exhibition of Maccoby's art prints. In 1940, Americans renamed the silkscreen technique serigraphy – literally, “silk drawing.” From 1932 until 1949, the Works Progress Administration produced an estimated 1,700 serigraphs for its Federal Poster Division (The Library of Congress, 2005).

Although Toulouse Lautrec (1864-1901), a famous French artist, developed venue posters of the Moulin Rouge and did not use the screenprinting technique, his work promoted specific events and influenced screenprinters to follow. Lautrec painted his posters one at a time (Johnson, E. & Whitten, C., 2003). This, of course, is a slower process than mass producing multiple originals as with screenprinting.

Printed posters made their way into the rock & roll scene in the mid-1950s, and remain



popular today. Part of the appeal of screenprinting in promoting rock & roll bands and venues is that it is fast and can be produced in large quantities. Posters are tied directly to the changing music over the past 50 years (Grushkin, 1987). Many of the early posters were produced for artists such as Elvis (Figure 1) by, among others, Hatch Show Print in Nashville, Tennessee (Grushkin, 1987). These early posters are quintessential Boxer Style; that is, they comprise solely the performer's picture, venue information, date, and time.

Figure 1. Elvis Florida Theatre Poster, Hatch Show Print, Nashville, TN.

Paralleling the rapid change in the music scene, the rock poster endured a metamorphosis into a full-fledged art form. Paul D. Grushkin (2004), a poster expert, explains that the Pop artist Andy Warhol's work had impacted both the art and music industries: “Warhol probably did more to establish screen printing as a fine art medium in the mind of the public than any other artist in history” (p. 109). In 1966, Warhol introduced a screenprinted multimedia album cover for the popular mid-sixties band, *The Velvet Underground & Nico* [Figure 2] (Bourdon, 1989). Warhol preferred to print his work with blotches of color to create multi-colored



portraits of celebrities such as Debbie Harry of the rock group, *Blondie* and Mick Jagger of *The Rolling Stones* (Figure 3).

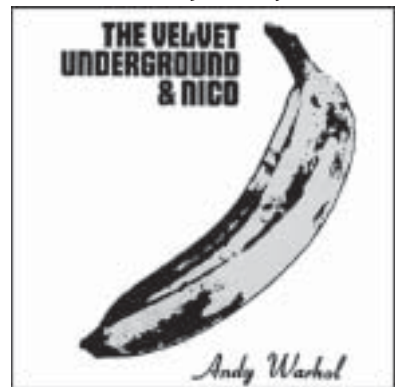


Figure 2. Andy Warhol. The Velvet Underground & Nico. Album Cover, 1966

Figure 3. Andy Warhol. Mick Jagger.

Gig posters were being created in the San Francisco Bay area during the counterculture movement around the same time Warhol was producing his art. These images were created

by young graphic artists in San Francisco's thriving music scene and were propelled in large part by two clubs, the Fillmore Auditorium and the Avalon Ballroom. Art Nouveau, Jugendstil, Viennese Secessionism and Surrealism were some of the movements that influenced poster artists during the 1960s (The Southern Alleghenies Museum of Art, 2005). In the early 1970s, the Punk style developed in England and was soon exported to America by word of mouth. The punk street culture exploded in New York, San Francisco, and Los Angeles in 1975-1983. Punk art was street art posted on lamp posts and telephone poles which were "either printed at neighborhood 'instant printers' or on Xerox machines by the dozens" (Grushkin, 1987) (p. 460).

The American Poster Institute, founded in 2002, now keeps track of the history of concert posters created by male and female artists (for more information visit www.americanposterinstitute.com/faq.php). This institute's collection is helpful when looking at the progression of posters from medium to medium, such as from lithography to screenprinting. From the end of the punk movement in 1983 to today, screenprinted posters have been revived. At the beginning of the punk movement, artists made quick and temporary photocopied flyers. However, the work transformed and became more artistic with the development of rock posters. Because of their high quality, people started to collect them.

Women in Screenprinting and Gig Posters

Current gig poster artists, those artists who create posters for a specific music event, are linked by the Internet on the preferred site www.gigposters.com. Gig posters took some time to be considered as works of art by some in the art world (K. Adrian, personal communication, July 8, 2005). Furthermore, women gig poster artists continue to be underrepresented. There is limited research on the topic of women gig poster artists. For example, Paul D. Grushkin's book, *The Art of Modern Rock*, contains only a few women. Less than 5% of the 400 artists profiled are women. When looking for women poster artists before the 1990s, I had an email conversation with Kathleen Adrian of the Smithsonian American Art Museum, who wrote:

Many early women screenprinters were associated with larger feminist groups ... and were not known by individual names. Even when a commercial artist is well-known for her work, if the artist has not sold at auction and/or if the artist has not exhibited widely, information can be difficult to track (K. Adrian, personal communication July, 8, 2005). One of the few known women printers during the late 1960s and 1970s was Catherine Weinstein, who lived from 1910 to 2003 (Figures 4-6). She used the pseudonyms Hedda Goldspace and Thunderbitch (D. Faggioli, personal communication, June 27, 2005).

Another quality of female screenprinters is that some of them have worked in groups and continue to do so today. Working in a group of artists has advantages such as spreading the work into smaller tasks and having a support system. The Women's Graphic Collective began silkscreened posters in 1970 for the women's liberation movement. This strong group of women produced thousands of posters with feminist images and sparked a new audience by using bold colors and phrases. The founders of the Women's Graphic Collective describe working in groups thusly:



Figures 4-6.
Catherine
Weinstein.

(They) wanted their new feminist art to be a collective process in order to set it apart from the male-dominated Western art culture. Each poster was created by a committee of two to four women led by the artist/designer (Chicago Women's Liberation Union, 2005).

In fact, the names of these artists were not displayed on the posters they created as a team. The group dissolved in 1983, but their posters are still available and sought after even today (Chicago Women's Liberation Union). See Figures 7-8.

Women who work in a group sometimes sacrifice personal recognition for a greater cause. Much like the Women's Graphic Collective, the Guerrilla Girls work for equality in the arts and is one of the most notable groups in existence. None of the Guerilla Girls' true identities is known. The Guerrilla Girls describe their art and plight as female artists:

We are a group of women artists and arts professionals who fight discrimination. We're the conscience of the art world ... We have produced over 80 posters, printed projects, and actions that expose sexism and racism in the art world and the culture at large (Guerrilla Girls, 1998, p.7).

THE ADVANTAGES OF BEING A WOMAN ARTIST:

Working without the pressure of success
Not having to be in shows with men
Having an escape from the art world to your 9 free-lance jobs
Knowing your owner might pick up after you're asleep
Being reassured that whatever kind of art you make it will be labeled feminist
Not being stuck in a featured leading position
Feeling your ideas live on in the work of others
Having the opportunity to choose between owner and motherhood
Not having to shake on those big cigars or paint in Italian suits
Having more time to work when your owner dumps you for someone younger
Being included in revised versions of art history
Not having to undergo the embarrassment of being called a genius
Getting your picture in the art magazines meeting a gorilla suit

© 1998 GUERRILLA GIRLS. ALL RIGHTS RESERVED. GUERRILLA GIRLS. CONSIDERED BY THE ART WORLD.

Figure 7. The Guerilla Girls. The Advantages of Being a Woman Artist.



**Figure 8. Women's Graphic Collective.
Springtime Will Never Be the Same.**

The Guerrilla Girls' messages are most successful in poster format, judging from the dozens included in the gallery of their website and their continual production of such works.

Today there are many other forms of group involvement. Even within this small population of women screenprint/gig poster artists, there are some internal differences. I began my search for women printers on [gigposters.com](http://www.gigposters.com) by posting a general message of my research goals and questions. After looking through Grushkin's *The Art of Modern Rock*, I posted the comment: "I saw many women who were partners in teams which should not go unnoticed." (Fitzgerald, <http://www.gigposters.com/forums/showthread.php?t=33110&page=1&pp=10&highlight=undergraduate+research>, 6/15/2005).

Melissa Buchanan responded as a part of a husband and wife team:

It's sort of tough being a woman in a dude/lady team. You get left out of a lot of things ... people occasionally act as if you're a traitor to women ... and more often than not people assume that you don't do any of the creative work (Buchanan, <http://www.gigposters.com/forums/showthread.php?t=33110&page=1&pp=10&highlight=undergraduate+research>, 2005).

There are a few female/male teams which are sometimes husband and wife or good friends. These duos include, Elizabeth Daggar and Kevin O'Connor, Sara and Brian Turner, Melissa and James Buchanan, and Julie Belcher and Kevin Bradley. There are also many women who prefer to work alone. Leia Bell does all the designing and printing of her art. Tara McPherson also prefers to work alone.

Although there is a scarcity of women gig poster artists to be found in books or articles, through my research I have discovered 29 contemporary women artists. After posting questions on www.gigposters.com, I attended an exhibit appropriately titled, *Paper Dolls*, which focused on the women who produce gig poster art. One of the most well-known artists because of her vibrant colors and distinct style, Leia Bell organized this show (Figure 9). In an interview with Steve Mendoza (2004), Bell elaborated on her life as a gig poster artist: "When I was pregnant with Cortez (so basically before I had kids) I was printing up to five posters a week." Currently, Bell prints smaller editions, which are due in part to the responsibilities of motherhood. She further described the size of her editions to Mendoza:

Sometimes it's as simple as that's all the paper I had lying around, or that's as many prints as I could get done before the ink dried in the screen ... All I can do is work within my means. When my older son was very small I didn't have him in daycare, so the number of prints in an edition was based around how long he would take a nap. If he slept for an hour, I could maybe get 60 pulls in before he woke up, so that set the edition size.



Figures 9. Leia Bell. Paper Dolls.

Comparing and Contrasting the Styles of Female Screenprinters

When looking through Paul D. Grushkin's book (2004) I found early men's posters that portrayed big-breasted women and/or hotrod cars as the focus of the poster. However, since the progression of the rock & roll screenprinting genre, the emphasis on women figures has declined. Women seem to have a very natural style or use less abrasive subjects. As far as style, women's posters have shown three themes. Often women incorporate animals, family figures or humans, and motherhood. For example, Bell gives a human touch to her posters and often incorporates family themes (Figures 10-13):



Figures 10 & 11. Leia Bell.



Figure 12. Leia Bell

Without realizing it I'm sure my kids impact my work ... The main way they impact my work is that I can't work as much as I would like. If I could I would print 16 hours a day, but for now I am limited to 9-5. I suppose this also inspires me to work as hard as I can when they are in daycare. I want them to be proud of what I do as well. (Bell, as quoted by Mendoza, 7/14/2004)

Bell further explains her choice of themes: “My work is a sort of human narrative ... My photos capture moments that people are part of, and when I translate them to poster images, people can relate to them” (Grushkin, Paul D., 2004) (p. 450).

Another female screenprinter featured in Paul D. Grushkin’s book (2004) is Tara McPherson. She formerly worked in a group, but decided to further develop her career by going solo. He describes her style as follows:

McPherson applies painterly technique to her rock posters ... and how she stages her characters within the environment she imagines, now puts her ahead of a milieu of artists who are classically trained and bent toward expressing a Rock & Roll ethos through a family of figures (p. 318).



Although these artists have not labeled themselves feminists, “feminist” may be an appropriate association. One artist in particular, Eleanor Grosch, creates posters with bold designs and feminist qualities. For example, one poster (Figure 13) has the full-bodied figure of a woman and a reverse left hand forming a rocker symbol. The poster’s text reads *Bride of Crotch Rock*, shown in the left leg. It implies a play on women in rock. In my view, the emphasis on the woman’s crotch shows that a female who works in a rock group can also be seen as a leader because the music industry is also male dominated.

Figure 13. Eleanor Grosch.

Interestingly, there are some female artists who create images which seem to come from a male perspective, much like early gig posters with hotrod women as the subject of attention. For example, Zeloot, of the Netherlands, uses a comic book style and curvy women on her posters (see Figure 14). Zeloot may be the exception to showing women as the object of posters. Some of her work is graphic and could be interpreted as being in the style of early men’s gig posters because of their objectification of women. Another artist with the pen name, Tanxxx, also uses bold choices of subject matter. Her style includes many women but in less abrasive ways than Zeloot. For example, in Figure 15, Tanxxx shows a woman playing the guitar with a baby strapped to her back. This implies her importance on motherhood, and the strong female.



Figures 14 & 15. Zeloot (Left) and Tanxxx (Right).

Conclusion

This research has shown the gap in documentation and recognition of women artists for this specific genre. As highlighted by the Guerrilla Girls it is just in the last 20 years that more women have been included in art textbooks. To expose this idea, the Guerrilla Girls (1998) begin one of their publications by showing parody covers of two well-known art history books, "*Gardner's White Male Art Through the Ages, Fifth Edition*" the other reads, "*H.W. Janson, History of Mostly Male Art*" (p. 8). Unfortunately, these covers are very true of the textbooks produced in America about Western Art. If women are not included in textbooks we can never expect them to be equally known and appreciated for their many contributions.

It is necessary to further research the contributions of female artists to the art world. Virginia Olesen (2000) argues that this research is important because: "Feminist work sets the stage for other research, other actions, and policy that transcend and transform [the world]" (p. 215). Additional research will provide female artists with an opportunity to voice their opinions about the meaning behind their work. Furthermore, equal representation in the art world will more readily teach society that female art work is as valuable and significant as art created by men.

In this study, I have found that most gig poster women want to be recognized and continue to create work that is to the best of their ability as well as earn a living and take care of their families. I imagine that many males in this genre have similar goals, however, as the Guerrilla Girls (2005) have pointed out, women artists receive unequal pay for the same work. If they are recognized, they are more likely to be included in textbooks and other media, which in turn can (1) change the perceived equality of women gig poster artists, (2) increase the value of their art, and (3) ultimately change the history of male-dominated art to show that all types of people and all genders equally create meaningful works of art.

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Catherine Weinstein Prints

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2-<http://www.postergeist.com/posters/cewscans/charliemusselwhite.jpg>

3-<http://www.postergeist.com/posters/cewscans/Charlie-M-Harmonica-Bird.jpg>

Eleanor Grosch Prints

<http://www.pushmepullyoudesigns.com>

Elvis Show Print

<http://www.countrymusichalloffame.com/shop/hatch1.html?id=1336>

Guerrilla Girls

www.guerrillagirls.com

Leia Bell Prints

<http://www.leiabell.com/index.php?p=4>

Mick Jaggar Print, Warhol

<http://www.warhols.com/portraits.html>

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Tanxxx Prints

<http://www.tanxxx.free.fr>

The Velvet Underground and Nico, Warhol

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Women's Graphic Collective

<http://www.cwluherstory.com/CWLUGallery/graphcoll.html>

Zeloot

<http://www.zeloot.nl>

Endnotes

1. Based on my own experience as a female screenprinter and my discussion with screenprinter Leia Bell.
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An Analysis of the Application of Balanced Ternary Logic to Arithmetic Circuits

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Since the first computers were developed, binary has been the primary form of logic, due to the availability of two-state circuits. The speed limit of binary logic is a function of the size and number of transistors that can be put in a determined space. According to Moore's Law, binary will reach its peak around 2017 and other solutions should be considered to replace binary.¹ A multi-valued logic solution based on the Balanced Ternary (BT) number system would improve computing by increasing the number range, processing negative numbers more efficiently, rounding perfectly, and reducing the overall parts count and interconnects.

Balanced Ternary Notation

All positional number systems operate essentially the same way. The value of each digit depends on its position within the number. The formula is: $d3(r^3) + d2(r^2) + d1(r^1) + d0(r^0)$. The digit (d) and radix (r) are multiplied to give a value for each position. The number 459 in base 10 is actually $4(10^2) + 5(10^1) + 9(10^0) = 400 + 50 + 9 = 459$. Each position is the multiplier and each digit is the multiplicand. In base 10, as one moves to the left, each value is 10 times larger than the previous. As one moves to the left, a binary number doubles, and a BT number triples. The following tables show the number 100 in base10, binary and BT notation. The top row in each table represents the value assigned to that position in exponent form. The second or middle row is the base 10 representation of the same value. The bottom row is the multiple of each value.

Table 1. 100 in Base 10

10^7	10^6	10^5	10^4	10^3	10^2	10^1	10^0
10000000	1000000	100000	10000	1000	100	10	1
0	0	0	0	0	1	0	0

$1(10^2) = 100$

Table 2. 100 in binary

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
0	1	1	0	0	1	0	0

$1(2^6) + 1(2^5) + 1(2^2) = 64 + 32 + 4 = 100$. Positional values are only added.

Table 3. BT

3^7	3^6	3^5	3^4	3^3	3^2	3^1	3^0
2187	729	243	81	27	9	3	1
0	0	0	1	1	-1	0	1

Balanced Ternary Notation uses the digits (-1, 0, 1) instead of (0, 1, 2) as in base 3.
 $1(3^4) + 1(3^3) + (-1(3^2)) + 1(3^0) = 81 + 27 - 9 + 1 = 100.$

Table 4. The first 11 numbers in BT notation

Base 10	Binary	BT
0	0	0
1	1	1
2	1 0	1 , -1
3	1 1	1 , 0
4	1 0 0	1 , 1
5	1 0 1	1 , -1 , -1
6	1 1 0	1 , -1 , 0
7	1 1 1	1 , -1 , 1
8	1 0 0 0	1 , 0, -1
.9	1 0 0 1	1 , 0, 0
10	1 0 1 0	1 , 0, 1

The number 2 in BT notation is $1(3^1) + (-1(3^0)) = 3 + (-1) = 3 - 1 = 2.$
The number 5 is $1(3^2) + (-1(3^1)) + (-1(3^0)) = 9 - 3 - 1 = 5$

Positional values are either added or subtracted depending on their sign. This method allows the representation of positive and negative numbers without the need for a sign digit. A BT number is negative if the leading digit is negative. To negate a number simply replace all -1's with 1 and all 1's with -1.² The number (-100) would be (-1 -1 1 0 -1) in BT notation.

History of Balanced Ternary Logic

Thomas Fowler invented the first balanced ternary calculating machine in 1838. The Fowler machine calculated the product of two BT numbers. This method allowed accurate calculation of the poor law tax, which, if done in base 10, would take considerably longer. Fowler did not want to publish the details of his machine for fear of exploitation, as had happened with his previous invention, the thermosiphon (central heat). His machine was demonstrated before the Royal Society in May 1840 and was witnessed by Charles Babbage and Augustus De Morgan. However, the invention did not get the attention it deserved from the government because of the large funding given to Babbage for his difference engine which was never completed. Although superior to all other calculating machines of the time the Fowler machine was never produced.³

Nine students from Moscow State University, under the direction of S. L. Sobolev, developed the first computer using BT arithmetic in 1958. The Setun computer was a sequential machine with 24 instructions. The address bus and control circuits were binary and the arithmetic circuits were ternary. Magnetic storage was accomplished using two bits made of ferrite beads to store one ternary trit. The Setun did not use a compiler since the instructions were simple and worked perfectly the first time it was turned on without the need for debugging. It was also very stable and reliable, which was unusual for computers of that time.⁴

Benefits over Binary

BT logic-based computers can store a much larger range of numbers than binary. That is, if an equal number of digits are used, BT numbers may be significantly larger than binary. A 16-bit binary number can represent numbers from -32,767 to + 32767 for a range of 65,535. A BT number of 16 digits can represent numbers from -43,046,721 to +43,046,721 for a range of 86,093,443 which is over 1,300 times larger than binary.

Seventy percent of the space required to build microprocessors is taken up by interconnects. BT logic would use fewer components than binary, resulting in an overall space savings of components and interconnects.⁵ A BT computer would use fewer digits than binary to represent an equal range. A smaller bus means fewer components in all associated areas in a microprocessor. Another byproduct of fewer components is higher clock speeds.

Binary uses the 2's complement method to handle negative numbers. First the binary number is inverted (all 1's are changed to 0's and 0's to 1's). Then 1 is added to the inverted number.⁶ This procedure is slow and inefficient. In BT, addition and subtraction are the same operation. The number to be subtracted is simply inverted. To invert a BT number, change all the -1's to +1 and the +1's to -1 and ignore the zeros.⁷ Table 5 shows the number 7 and -7 in BT.

Table 5. Inversion in Balanced Ternary

3 ²	3 ¹	3 ⁰	base 10
1	-1	1	7
-1	1	-1	-7

$9-3+1=7$ and $-9+3-1=-7$


Rounding in binary is a problem for scientific applications. In military applications where accuracy is critical, rounding errors could cost lives. In September 1991, 28 Marines were killed when a Scud missile struck their barracks. A Patriot missile failed to intercept the Scud due to a rounding error in the guidance system. An internal clock error of 0.34 second developed over a 100-hour period, and while this error may seem very small, it was large enough to render the Patriot inoperable.⁸ In BT, rounding is equivalent to truncation; the number to be removed cannot be five so rounding is always perfect.

Proposed Balanced Ternary Gates

I propose the following four functions which are based on BT arithmetic truth tables to realize an adder circuit. These functions are similar to binary and could even be used in binary circuits. The TAND (Ternary AND) gate would have inputs A and B and an output Z. Table 6 shows the relationship between A, B, and output Z. The top row represents the three states of

input B, the left column represents the three states of input A, and the intersection between A and B is the output state. The Binary AND gate is represented in the TAND truth table, which means that this gate can substitute as a Binary AND gate. With the exception of the TNOT, all other BT logic gates could substitute as binary gates.


Table 6. the TAND symbol and truth table



A \ B	-1	0	1
-1	-1	0	0
0	0	0	0
1	0	0	1


The Ternary OR function also includes the binary OR truth values. The negative portion of the TOR truth table is the inverse of the binary or positive values. These gates are an expansion of binary in the negative, making them symmetrical. There are also two additional truth values in the table. These values are the opposite condition where A is always the inverse of B. This condition is not needed for BT addition and for this purpose will always output zero. Table 7 shows the TOR truth table. Tables 8 and 9 show the TXOR and TNOT respectively.

Table 7. TOR symbol and truth table



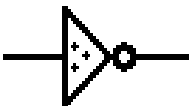
A \ B	-1	0	1
-1	-1	-1	0
0	-1	0	1
1	0	1	1

Table 8. TXOR symbol and truth table



A \ B	-1	0	1
-1	0	-1	0
0	-1	0	1
1	0	1	0

Table 9. TNOT symbol and truth table



IN	OUT
-1	1
0	0
1	-1

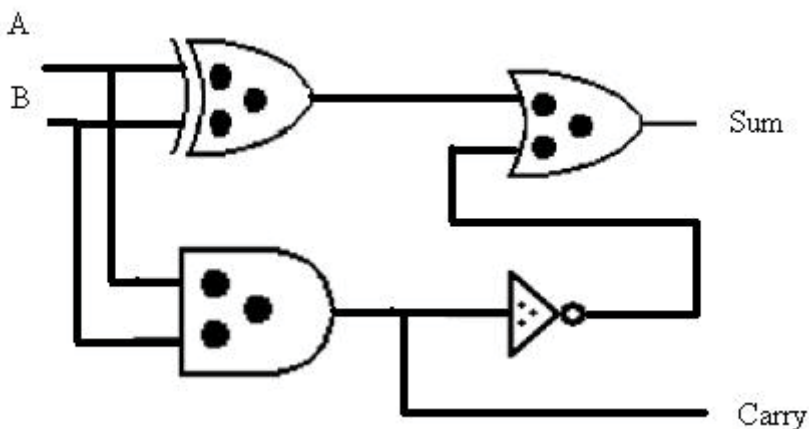
These four BT gates can be combined to realize BT addition. The circuit must operate according to table 10. There are nine possible outputs for the two inputs. The column A/B represents the possible values of input A, the row A/B represents the possible values for B, and the nine other boxes represent the output for Sum/Carry.

Table 10. BT addition truth table

BT addition		sum/carry	
A \ B	-1	0	1
-1	1/-1	-1	0
0	-1	0	1
1	0	1	-1/1

The circuit in table 11 is proposed to realize BT addition. Input A and B are the two BT digits to be added. The circuit could easily be modified to realize subtraction. A TNOT could be used to invert the B inputs. The output of this modified function would be the difference between A and B.

Table 11. BT half adder



Conclusion

Balanced Ternary Logic has many advantages over binary which make it the most efficient of all logics. BT logic should be considered as an alternative to binary for high-precision applications such as guidance systems. BT logic would increase the performance of computers without increasing the component count and at the same time decrease power consumption. The benefits of BT logic in several applications make it worthy of future research.

Future Research

Future plans include constructing circuits for evaluation and testing and developing test criteria. I will also explore methods to realize other BT functions including a memory element, an arithmetic logic unit, and multiplexers. Also, theorems need to be developed to describe logic minimization.

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Managing the Silent Killer: Hypertension

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Abstract

Hypertension, often known as high blood pressure, affects nearly 65 million Americans (Meehan-Hurwitz, Cooke, and Finn 2004), with African Americans being more susceptible (Peter and Flack 2000, Price and Cooper 2003). According to the American Heart Association (2002), 26.2 percent of people with high blood pressure are taking medication, but still do not have blood pressures in a safe range. Factors associated with poor blood pressure control include: lack of overt symptoms, under treatment by physicians and other healthcare providers, and lack of lifestyle modifications by patients. Lack of proper treatment and blood pressure control can lead to average annual healthcare expenditures that are 10 times higher than the expenses incurred by patients who are well-controlled (American Heart Association, 1999). Poor blood pressure control also increases the potential for life-threatening complications such as stroke, kidney damage, and myocardial infarction. This project involved an extensive literature review, including searches of the Cumulative Index to Nursing and Allied Health Literature (CINAHL), InfoTrac, and MedLine databases for studies addressing hypertension management and treatment compliance. Following a pilot test, 27 subjects were interviewed in a qualitative approach to examine the perspectives of hypertensive patients in relation to their lifestyles and compliance with their treatment regimens. Common themes were identified from the interview data, and nursing implications are recommended.

Background

Many Americans face the challenge of complying with prescribed regimens and lifestyle modifications for a variety of reasons. Research reveals that 43,000 hypertensive patients die annually due to poor management and complications from this disease (Romain, Patel, Heaberlin, and Zarowitz, 2003, p. 1069). According to the American Heart Association (n.d) the barriers to success are often determined by the difficulty of the behaviors recommended, the complexity of the regimen, and the ease of incorporating therapy into a patient's lifestyle. In addition, adherence varies according to individual levels of incentive, therapeutic intent or goal, and the ability to afford proper care. Another assertion is that education is lacking about hypertension among those who have it. Alexander, Gordon, Davis, and Chen (2003) explain that 80 percent of 2500 participants in their research study did not recognize 140/90 mm Hg as high blood pressure and many were not able to recall their blood pressure reading from their last clinical visit. Magill, Gunning, Saffel-Shrier, and Gay (2003) indicate that only 70 percent of patients with hypertension are aware of their condition while only 59 percent are receiving treatment, and only 34 percent have received adequate control (p. 853).

Although a major part of managing hypertension is patient compliance with therapy (diet, exercise, smoking cessation, stress management, and medication), another barrier to controlling

this disease is the under treatment of hypertension by physicians. Xu, Moloney and Phillips (2003) indicate that compliance with the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC) guidelines is low, and that only 36 percent of patients with hypertension received first-line drugs (beta-blockers and diuretics) in 1996 (p. 529). Failure to prescribe appropriate treatments can lead to increased expenditures, costing a patient \$14,582 annually from complications, versus the average cost of \$895 for well-controlled blood pressure. Research findings confirm that abiding by the recommended JNC guidelines for managing hypertension would reduce expenditures by \$2.6-3.2 billion annually (Xu *et al*, 2003, p.529).

Purpose

In light of the various factors that affect compliance worldwide, the purpose of this project was to conduct a qualitative research study that will better elicit patients' knowledge, attitudes, beliefs, and experiences related to lifestyle modifications and adherence to prescribed treatment regimens. This form of research helps to identify lived experiences, which may contribute to our understanding of hypertension treatment compliance and management.

Literature Review

An extensive literature review was conducted using searches from CINAHL, InfoTrac, and MedLine databases for studies addressing hypertension management and treatment compliance. The first phase included searching the Infotrac database for research studies on hypertension alone, avoiding combined diagnoses such as pulmonary hypertension. The search yielded numerous articles that provided background information and some research study articles, which offered insight on the problems associated with the management of hypertension. The second phase focused on reviewing research articles from the CINAHL database to specifically identify nursing research studies. Key words used in the search were *hypertension*, *compliance*, *adherence*, and *nursing interventions*. Articles dealing with research studies, lifestyle modifications, and treatment regimens were retrieved and reviewed. The third phase of the literature review included searching MedLine for research articles from other healthcare disciplines that contained the key words *hypertension*, *compliance*, and *adherence*. The primary sources that guided this research have been cited above.

Pilot Study

Following the Institutional Review Board approval in June 2004, a qualitative study was initiated with a pilot test of four hypertensive patients (two females and two males) between the ages of 42-71. The interviews were tape recorded. Shortly after each interview, all responses were transcribed verbatim by the interviewer. The pilot study provided opportunities for the researcher to refine the data collection methods. Refinements included trouble-shooting problems with the tape recorder and modifying the interview approach slightly to probe further and elicit more detailed responses from participants.

Methods

A descriptive, exploratory research design was used to elicit perceptions of the participants regarding hypertension, how it affected their lives, their adherence to therapy, and their thoughts about managing these challenges. Flyers describing the study and requesting volunteers were

posted in a church foyer with the support of the local minister. Volunteers were offered a \$5.00 Wal-Mart gift card as an incentive to participate. Over 30 hypertensive adult volunteers were recruited from the church congregation, a university, and community contacts. The researcher met the participants at the locations of their choice. Interviews were conducted in homes and at work sites. With written informed consent of each participant, all interviews were tape recorded and hand-written notes were taken during the interview. The interviews lasted between 20 to 60 minutes. After the interview, all tape-recorded conversations were typed verbatim into a word-processing program.

At the beginning of each interview, a survey was completed to gather demographic information including gender, age, marital status, ethnicity, years of education, onset and length of time with hypertension, other chronic illnesses, prescribed medications, family history of hypertension, hospitalizations, and average blood pressure. Then, open-ended questions were asked and the interview was conducted in a conversational manner. Interview questions included the following:

- Since your diagnosis, how has high blood pressure affected your life?
- Please tell me what you do to manage your blood pressure, or to keep it under control.
- Is there anything that your doctor, nurse, or family could do to help you better manage your blood pressure?
- Is there anything else you would like to tell me about your blood pressure and how it has affected you?

The demographic data were analyzed using descriptive statistics and SPSS software. Answers to the open-ended questions were transcribed verbatim. Analysis of the qualitative data included systematically reading each interview transcription and the assignment of codes to each question, and then the assignment of code phrases to identify repeated themes. All interviews were read and coded by two investigators to assure trustworthiness.

Participants

Twenty-seven (N=27) subjects actually completed the informed consent process, the demographic survey, and the interview. The sample included 11 males and 16 females (59.3%). Their ages ranged from 22 to 80, with a mean of 54.5 years. Twenty-three subjects were African Americans (85.2%) and four were Caucasian. Sixteen (59.3%) were married while the others were single, divorced, or widowed. Their years of education completed ranged from 10 to 22 (mean = 13.3) years. All 27 subjects had a family history of hypertension. The overwhelming majority were diagnosed during a routine check, such as an annual physical exam or a health fair. Only four had symptoms (headache, visual changes, or a stroke) prior to discovery of their hypertension. The shortest time span since a subject had been diagnosed with hypertension was six months, whereas the longest was 47 years, the mean was 14.2 years. Medication regimens varied widely among the group, with some being more complex or expensive than necessary.

Results

Qualitative analysis of the transcribed interviews provided an increased understanding of the challenges associated with living with hypertension and adherence to related therapies. Three major themes were identified: 1) forgetfulness, 2) challenging lifestyle modifications related to dietary changes, and 3) needing emotional support from families and providers.

Forgetfulness

Subjects were asked: Do you ever skip your medication or take it differently than it is prescribed? Eight subjects admitted to occasional non-adherence to their prescribed regimens, simply because they forgot. The following are two examples from subjects' responses:

- "Sometimes I forget or can't remember if I took it that day."
- "Very rarely, but sometimes, if I'm really tired, I forget."

Although forgetfulness was the main theme, it can be reasonably assumed that the cost of prescribed medications may also be a factor causing subjects to skip or take their medications differently than recommended. It was apparent that some subjects were not comfortable discussing their financial situations. In relation to this question, one subject did comment:

- "Sometimes I skip just before payday."

Lifestyle Modification

In responding to questions concerning the effects of hypertension on their lifestyles, some participants stated that having hypertension had little or no effect on their lives due to the lack of symptoms. One person responded:

- "It really hasn't. You know they call it the silent killer, so you don't really realize that it does, if it does I don't know it, you know; because my head doesn't hurt or anything like that. None. I just know that I need to do better to try and keep it down."

The majority of participants made some adjustments in their diet, specifically in the area of reducing sodium intake. Participants stated:

- "My eating, I am on a low-sodium diet ... I try to stick to it, but sometimes that doesn't happen."
- "The diagnosis has affected my life big time. Especially, in the area of my diet. I cannot eat any of the foods I like."
- "My diet plays a sufficient part in controlling my blood pressure. I certainly can't eat what I used to!"
- "I eat my fruits and vegetables now. In times past I hated any type of vegetables. And after years of hating vegetables I'm finding out that they are not bad at all."

It was clear to note that some of these adjustments were not easy to make and respondents were struggling in this area, as well as with exercise. Exercise was recognized as something that should be done, but only a few were actually complying.

Emotional Support

Many patients declared that lack of emotional support made it challenging in coping with the management of the disease. This lack of emotional support was particularly challenging in relation to the challenge of dietary changes. The following are excerpts from participants:

- "Yes, my family members can be more understanding. Understand that I can no longer eat a lot of fatty foods. And stop offering it to me!"
 - "It wouldn't hurt if they wouldn't eat certain foods in front of me, knowing that I can't have them."
-

Participants implied that dealing with the disease would be easier if there were more emotional support from family and providers. One man jokingly shared a positive comment about familial support in relation to whether he skips or alters his medication regimen.

- “No, I have a human alarm that goes off ... my wife!”

Nursing Implications

Based on the demographic trends and themes identified, the following recommendations may be helpful to nurses when teaching patients about the management of hypertension:

- Teach high-risk candidates the importance of regular blood pressure monitoring, since most patients do not have symptoms before diagnosis.
- Help patients and caregivers develop reminder strategies to manage or avoid forgetfulness related to medications.
- Educate families about the importance of providing emotional support, particularly associated with dietary changes.
- Provide patients and caregivers with new developments and updated information related to managing their blood pressure.
- Reinforce the notion that hypertension is the “silent killer.” Patients may not have symptoms or major effects on their lives, but adherence to prescribed therapies is still important to prevent deadly complications.
- Emphasize the importance of medication adherence. Many patients, especially elders, take this advice seriously, when the care provider emphasizes it.
- Some patients can be motivated toward greater compliance by offering a care plan with the goal of potentially decreasing or eliminating medication in the future.

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Characterization of Bacterial Pathogens of Amoebae

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Abstract

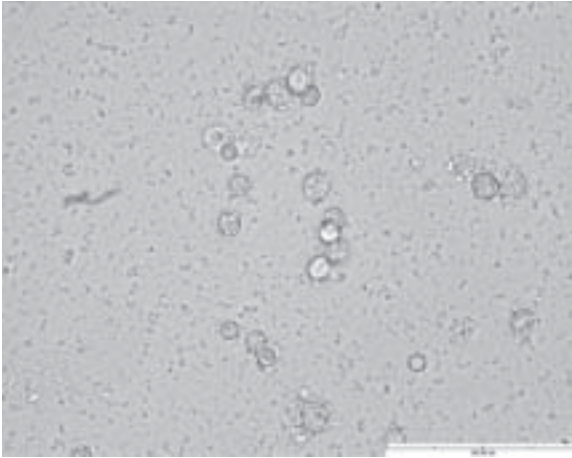
The interest in free-living amoebae as a source of bacterial pathogens has grown since the realization that these organisms can harbor both fastidious and unculturable pathogens, which can go undetected during routine laboratory culture or water sampling (1). We have isolated and identified bacteria in free-living amoebae from both human-made and environmental sources. Water samples from natural and human-made environments were inoculated onto water agar plates containing E.coli to enhance the growth of amoebae. Enriched amoeba cultures were then co-cultured with Acanthamoeba polyphaga in sterile spring water to permit the growth of amoebal pathogens. Washings from these cultures were added to new cultures of A. polyphaga and observed for infected amoebae. Using this procedure, an amoebal pathogen has been detected from a bovine water trough, an apartment cooling unit and a Tennessee cave. Following entry, the amoebal pathogen replicates in cytoplasmic vacuoles until lysis occurs. Isolation procedures utilize filtration and dilution protocols as well as antibiotic treatments. Sequence analysis of the 16S rRNA gene will be conducted to determine the relatedness of this organism to other bacteria. Upon isolation, future studies will characterize the interaction of the bacteria with human macrophages. As potential human pathogens continue to be identified by their ability to resist killing in amoebae, improved isolation techniques need to be identified, especially as these bacteria may be harbored within complex biofilms of microorganisms.

Introduction

In 1976, in Philadelphia, 221 retired veterans attending a Veterans of Foreign Wars conference became ill, resulting in 34 mortalities. The disease was named Legionnaire's disease or Legionellosis in honor of these veterans (2). The etiological agent of the disease was discovered and isolated, and the bacterium was named *Legionella pneumophila*. Studies have confirmed that free-living amoebae are necessary for *Legionella pneumophila* multiplication in aqueous biofilms (3). Subsequently, several other Legionella-like amoebal pathogens (LLAPs) that also replicate within and destroy amoeba have been identified (4,5).

Amoebae are common inhabitants of water systems such as air-conditioning units, cooling towers, spas, hot tubs, and showerheads, as well as natural aqueous environments (6). Because they are eukaryotic organisms, amoebae are resistant to the biocides designed to kill prokaryotic organisms and therefore may protect the bacteria from these disinfection strategies.

Interestingly, the etiologic agent of approximately 50 percent of pneumonia cases is unknown. The increased contact of humans with water systems that create bacteria-contaminated aerosols may explain the emergence of new pneumonias and other diseases with unidentifiable etiologic



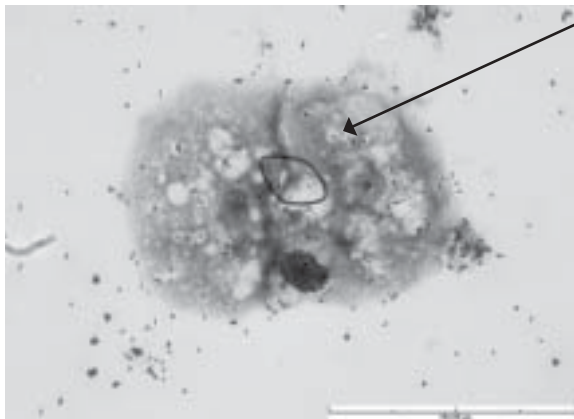
Numerous bacteria are visible in the amoebal co-culture.

Figure 2. Differential interference contrast (DIC) image after the inoculation of positive amoebae into an individual well in a 6-well, flat-bottom, microplate.

Table 1. Record of Sample Observations

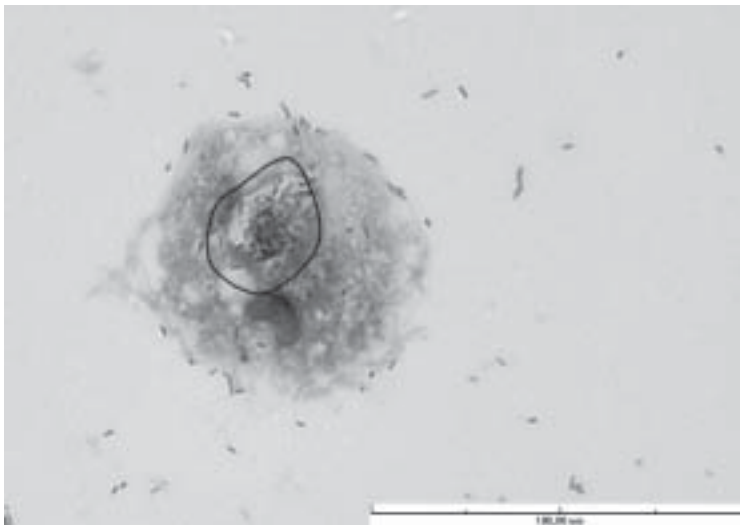
Key: + = Positive for infection; ? = Questionable positive; - = No visible positive

Sample Name	7/9	7/12	7/13	7/14	7/15	7/18	7/19	7/20	7/21	7/23
Trough 202 Room 7/9	+	+	+	-	-	?	?	-	?	-
Cruze Cave Room 7/7	+	?	?	?	?	-	-	-	?	-
Cruze Cave Room 7/9	+	?	?	?	?	-	?	?	-	?
Cruze Cave Room A 7/15						-	?	-	?	-
Cruze Cave Room B 7/15						-	?	-	?	-
Berry Cave Room 7/7	-	+	+	-	?	-	-	?	?	-
UC Filter Room 7/11		-	-	-	-	-	-	-	-	?
UC Trav Room 7/11		-	-	-	-	-	?	?	-	?
Stone Cave Room A 7/14					-	?	?	?	?	+
Stone Cave Room B 7/14					?	?	?	-	?	-
Old Trough 30°C 7/6	?	?	?	+	-	?	?	+	?	+
Trough 202 30°C 7/7	?	?	+	?	-	?	?	-	+	?
Trough 202 30°C A 7/9	+	?	-	-	-	-	?	?	?	+
Trough 202 30°C B 7/9	+	+	+	+	+	-	-	?	?	?
Trough 202 30°C 7/15						?	-	?	?	-
Cruze Cave 30°C 7/7	-	-	-	-	-	-	-	?	-	?
Cruze Cave 30°C 7/9	+	?	-	?	-	?	-	-	?	?
Berry Cave 30°C 7/6	+	?	?	?	+	?	?	-	?	-
Berry Cave 30°C 7/9	+	+	-	+	?	-	?	-	-	?
Berry Cave 30°C 7/15						?	-	-	?	-
UC Trav 30°C 7/11			?	+	+	?	-	?	-	?
UC Outside 30°C 7/11			?	?	-	-	+	+	?	-
UC Filter 30°C 7/13				+	?	-	?	?	?	+
UC Outside 30°C 7/20									+	+
Stone Cave 30°C A 7/14					?	-	-	-	?	
Stone Cave 30°C B 7/14					-	-	-	-	?	-
Jackson Cave 30°C 7/14					-	?	-	-	?	?



Visible infection of the amoeba: The large amount of bacteria circled is in one of the amoeba's vacuoles.

Figure 3. Image of infected amoeba nucleus following Giemsa staining.



Visible infection of the amoeba: The large amount of bacteria circled is in one of the amoeba's vacuoles.

Figure 4. Image of infected amoebae vacuole following Giemsa staining.

Summary

- A total of 26 samples were collected from seven sites of human-made and natural sources. All of the samples were monitored on a daily basis to check for infected amoebae.
- Amoebal pathogens were detected in 50% of the samples from natural and human-made sources.
- At least two amoebal pathogens have been successfully passed in *A. polyphage* co-culture.

Further research will include isolation of the bacteria using antibiotics and filtration techniques. Future projects will also include sequencing of the 16S rRNA gene to identify these microorganisms.

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Terrorism in a Unipolar World

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Introduction

The goal of this paper is to introduce the changes in international relations theory related to the emergence of terrorism's role in the new unipolar world, as compared to its role in the bipolar Cold War system. The research includes:

- 1. The role of The United States and the reasons for the growth of anti-Americanism*
- 2. The role of non-state actors*
- 3. The targeting of the status quo by extremists*
- 4. Role of religion as a driving ideology*
- 5. Al Qaeda as a non-state actor similar to a multinational corporation*

Al Qaeda will be the subject of a case study. This paper will consider the ideology, methods, goals, and motivations of the new Al Qaeda threat, comparing it with previous threats, as well as examining its evolving status. This paper will also discuss the phenomenon of Islamic fundamentalism and its relationship with the secular regimes in the Middle East. The phenomenon of anti-Americanism in the modern world will be explored with the goal of evaluating U.S. foreign policy methods. The author will raise questions pertinent to the future foreign policy of the United States.

Ideology: What is Wahhabism?

Wahhabism is central to the ideology of Al Qaeda. As an ultra-conservative form of Islam, Wahhabism originated in Saudi Arabia in the 18th century. The philosophy of its founder, Abd-al-Wahhab, was that Islam had deviated from its original intention to honor the monotheistic God. Islam had become polytheistic, involving the honoring of saints. "The evidence of polytheism was everywhere in the Muslim world: Muslims worshiped at the prophet's tomb. They went on pilgrimages to mosques built upon the tombs of saints" (Baer 2003, 84). Undoubtedly there are references here to the Shia's reverence for Imam Ali, believed by Shias to be the Mahdi, or deliverer.

Abd al-Wahhab is a noted scholar in a long string of Islamic theologians who have written about the deviation of Islam from its original tenets. The basic perception is that the Islamic world has been repeatedly occupied by the Crusades, Mongols, Ottomans, and British. Islam, therefore, has been subjected to the influences of the outside world. These influences, the Wahhabists believe, have caused the faith to be tainted and has imposed many obstacles between man and his creator. The advocacy of praying to saints, visiting tombs, and the introduction of pagan practices have caused Islam to become a shell of its former glory, thus earning God's displeasure, and causing the Muslim world to be repeatedly humiliated. The only way to return to the "righteous path" is to abolish all of these practices and return man to his oneness with God.

It is through the radical interpretations of Wahhab that the justification for the killing of innocents has been sanctioned. Christianity has been particularly singled out, along with Shi'ism. The Prophet Mohammed originally stated that Christians should be treated with respect due to their monotheistic faith in the God of Abraham. However, this protection does not exist in the same terms today. As one Islamic leader states, "The people of the book of our day are not the same people of the book in the days of Mohammed" (Gold 102). The author explain that the new Christianity has "polytheistic tendencies – for instance, the Holy Trinity – and thus were no longer monotheistic faiths" (Gold 102). Thus, despite their claims of interpreting the Koran and Haddith literally, some Islamic leaders appear to reinterpret their faith to provide justification for violence.

Islam, *per se*, is actually very tolerant to Christians and Jews, the People of the Book. It is not, as a whole, overly exclusionary. The actions of the radical Wahhabists have been condemned repeatedly, and their track record for violence against other Muslims, who they view as apostates from Islam, is well documented.

The underlying political goal of the modern Wahhabist movement is to return Islam to its glorious period, immediately following the death of the Prophet Mohammed. "Many Muslims look back at the century after the revelations of the Prophet Mohammed as a golden age. Its memory is strongest among the Arabs. What happened then (the spread of Islam from the Arabian Peninsula throughout the Middle East, North Africa, and even into Europe within less than a century) seemed and seems, miraculous. Nostalgia for Islam's glory remains a powerful force" (9-11 Commission Report 50).

This perception resonates in one of Al Qaeda's goals, the re-installment of the Caliphate to unite the Muslim world, governed by Sharia law. The usual goal of Al Qaeda for nations is the elimination of secular governments in favor of a government ruled by Sharia law. In many cases, Al Qaeda enjoys vast public support within these countries. In Algeria, the "Islamists seemed almost certain to win power through the ballot box when the military preempted their victory and set off a civil war" (9-11 Commission 53). In Egypt, the Muslim Brotherhood, which paved the way for this movement, also sought to remove the secular Egyptian leadership. This movement, although long-term, has lost some steam in recent years. The above examples provide opportunities for Al Qaeda to appeal to the disenfranchised Muslim youth in these countries, who feel as though their leaders are inefficient and corrupt. "A common denominator that unifies them all is the perception of Islam's present situation as that of a culture being lost" (Shay 12).

Al Qaeda's biggest rallying cry is the stationing of U.S. troops on the Arabia Peninsula. "The dying edict of the Prophet Mohammed had been 'let there be no two religions in Arabia'; now infidels of both sexes were trespassing in the holy land" (Bergan 77). The withdrawal of U.S. forces from Saudi Arabia would be essential to any plan to remove the present monarchy. Allowing U.S. forces in the kingdom also gave credence to the claims of Bin Laden that the self proclaimed "custodians of the holy sites" were in fact apostates from Islam. "He could not believe it; letting nonbelievers into the kingdom of the Two Holy Mosques was against the beliefs of the Wahhabist branch of Islam" (Clarke 59).

To understand the bigger picture of Al Qaeda's goals, one needs to understand the history of the Islamic world. From its glory days to the periods of subjugation and colonialism, and then, the humiliating defeat at the hands of Israel, the Arab world has been plagued by conflict and a deviation from its traditional values. While it can be argued that Wahhabism is a violent form of Islam, it can also be viewed as a desire to practice Islam in its purest state, as was practiced by the Muslims during the time of Mohammed. While the vast majority of Muslims do not

agree with the killing of innocent people, they can agree that they are not living in ascendant Islam. "Beyond the theology lies the simple human fact that most Muslims are repelled by mass murder and barbarism whatever the justification" (9-11 Commission, 54). The real issue is how to return to those glorious days: through violence or through peace?

Wahhabism: Theorists of the Movement

Ibn Abd Al-Wahhab (1702-1792): Wahhab was the founder of the modern Wahhabist movement. His teachings have been greatly disputed, with various interpretations. Despite the fact that many Wahhabists have participated in the violent acts of terrorism worldwide; his teachings seem to carry a contrasting theme. "He believed that there were times when violence was justified, as in the case of self defense. However, he was neither an active supporter nor a promoter of violence because he believed it stood in the way of the ultimate goal of Muslims – the winning of converts. He believed that life was something to not only be respected, but celebrated" (Delong-Bas 17).

The followers of Wahhab did not appear to share his views of tolerance and acceptance. The very idea of attacking different Islamic practices is a highly revolutionary concept. In order to purify the faith, the polytheistic practices had to be destroyed. This led to a conflict within the already divided Islamic faith. History has shown the Wahhabists to be destructive of the other cultures that they found to be un-Islamic in nature, perhaps even paganistic or polytheistic in their nature. "For Wahhabists, such actions are part of their war against idolatry. It is not a tremendous leap from the Wahhabi sacking of the Shiite holy city of Karbala in 1802 to the Taliban's destruction of the Buddhist statues in the Bamian valley in Afghanistan in March 2001" (Gold 12).

Wahhab also had a profound influence on Saudi Arabia's politics. During his time, Arabia was lacking a central government, as it was a land of warring tribes. Wahhab's message was radical enough to force him to attempt to acquire a degree of protection from one of these tribes. The tribe of Saud was willing to oblige, as it prepared to make its push to dominate the peninsula. With Wahhab, the Saudis found a source of legitimacy for themselves to be fit as the protectors of the holy sites of Mecca and Medina. In the Saudis, Wahhab found protection and a vehicle to spread his message. The families intermarried and the connection between Wahhabist ideology and Saudi power became united with one another, as they continue to this day.

Ibn Taymiya (1236-1326): Taymiya is one of the most frequently cited scholars in Islamic texts as justification for violence. He is believed to have been one of Wahhab's biggest influences. Taymiya explored the question of whether it was legitimate to kill other Muslims during a period of jihad. It is important to note that the period in which Taymiya lived was one in which the Islamic world was dominated by the Mongolian empire. While the Mongolians converted to Islam, they "continued to follow the Yasa legal code of Genghis Khan instead of the Sharia, they were not real Muslims, but Apostates who should be punished with death according to the Sharia. It was the right, indeed the duty, of Muslims to wage jihad against them" (Sageman 9).

If this concept sounds familiar, it is for good reason. It is nearly the exact language of the fatwa issued by Osama Bin Laden in his declaration of war against the United States. This logic is also applied to the conflict between secular regimes and the Islamic movements within their countries. To many militants, the language of Taymiya is almost prophetic in its relation to current events, and instills for them a sense of legitimacy in their cause.

Contemporary Islam is not practiced in the same fashion as it was during the time of Mohammed, according to many modern scholars. The lack of purity in the religious practices is

a direct result of the infiltration of the many various cultures that have directly influenced the Muslim world. Taymiya's writings speak to today's radicals, who are distraught by the secular regimes that rule many predominately Muslim countries.

Anti-Americanism: Roots

Many Americans have long held a misguided view of the Middle East as a region of the stereotypical Arab, violent and ill-tempered, with a blind hatred for anything non-Islamic. This is a misguided stereotype of people who historically have given Christians and Jews in their lands more rights than Muslims were given in Christian lands. The perception of America in the Middle East in the first part of the 20th century greatly conflicts with present views. "Arab rage at America is relatively recent. In the 1950s and the 1960s, it seemed unimaginable that the United States and the Arab world would end up locked in a culture clash. Egypt's most powerful journalist, Mohamed Heikal, described the mood at the time: "The whole picture of the United States ... was a glamorous one. Britain and France were fading, hated empires. The Soviet Union was 5,000 miles away and the ideology of communism was an anathema to the Muslim religion. But America emerged from World War II richer, more powerful, and more appealing than ever.' To understand the roots of anti-American rage, we need not plumb the past 300 years, but the past 30" (Zakaria 2001).

Another important factor is that the international system is now highly unipolar, with the United States being the sole superpower. This can bring changes to the rules of the international game. For one, the superpower can easily be blamed for the shortcomings felt in the global south, as poverty is an ever-present factor in many countries still feeling the burden of the legacy of colonialism. The unfavorable terms of trade are a barrier to modernization, and this can create resentment from the impoverished, as they seek to find reasons for their present condition.

The United States is an easy target, considering the scale of its international mass media exposure and cultural influences. "America stands at the center of this world of globalization. Americans are so comfortable with global capitalism and consumer culture that we cannot fathom how revolutionary these forces are" (Zakaria 2001). The United States is easily the wealthiest nation in the world. The eyes of the wealthy tend to underestimate the extent of resentment that comes with such a title.

American foreign policy in the past 30 years has been flawed to the degree that it fails to understand the frustrations of many Arabs. Obviously, any group that has been subjected to frequent colonialism of the European powers will be increasingly sensitive to any attempt to influence their domestic affairs. The United States has inherited a perception that originally applied to European powers, deemed to be hegemonic in its foreign policy. The policies of the United States in the Middle East are perceived to be based largely on a need to appease national interests in the continuation of maintaining a dependable energy source. This is frequently referred to as the "politics of oil."

The discovery of oil on the Arabian Peninsula, as well as in many other locations in the Arab world, has created an unprecedented need for dependable leadership that would be willing to do business with the United States. Unfortunately for the citizens who lived under such leaders, the domestic policies of many of these rulers have been particularly harsh. In addition, when the period of colonialism came to an end, and new states were formed, the boundaries were frequently drawn up with little regard for the ethnic or religious divisions that had existed within these territories. Such is the case with Iraq, where there are three such dominant groups, and the likelihood that any of the three will want to control the affairs of the state to benefit their own

ethnic group is high. Any ruler who has to govern in a situation such as this is likely to employ force in order to maintain his power, and avert any power grab attempt by his competitors.

Unfortunately for the United States, these are the leaders with whom they are frequently forced to do business. This was the case with Iran, whose leader up until 1979 was the Shah. The Shah used a brutal secret police, known as the Savak. This organization was known for its ferocity in protecting the Shah's dictatorship. When people are oppressed under these circumstances, and they witness the United States allying with those who oppress them, the United States takes on the appearance as the "Head of the Snake," as Bin Laden has frequently stated.

The legacy of colonialism is still felt as several leaders whose regimes were initially implanted by the colonial authorities remain in power today. Many Arabs see this as a deliberate attempt to maintain a shadowy hold on their affairs, undermining the idea of Arab nationalism and self-determination. The repressive regimes of the Arab world are seen by the fundamentalists to be un-Islamic due to their secular nature. They also are seen as a barrier to Arab nationalism, as the regimes in control cling to power, protecting their sovereignty. "Arab unity cracked and crumbled as countries discovered their own national interests and opportunity" (Zakaria 2001). Zakaria also notes the damage done to the movement of Arab nationalism when Saddam invaded Kuwait. This is a key factor insofar as Saddam's personal national interests superseded any notion of a single Arab nation.

Secular Arab regimes are common. Essentially, only two countries in the Middle East employ Sharia law on a full scale: Iran and Saudi Arabia. Many Arabs are hungry for change, considering that vast oil wealth in the Middle East should provide for a higher standard of living. "Regimes that might have seemed promising in the 1960s were now exposed as tired, corrupt kleptocracies, deeply unpopular and thoroughly illegitimate. One has to add that many of them are close American Allies" (Zakaria 2001).

A new assertion in international relations is that the hatred and violence towards the United States is merely collateral damage resulting from the internal struggle within the Arab world between modern secular regimes and the more traditional religious clerics. These clerics desire societies in which the law of God, Sharia, reigns supreme as the law of the land. Westernization, which is deemed to be corrupting, is to be expelled. Many more pragmatic Muslims see the clerics as obstacles to modernization, needed if there is to be victory over the state of Israel.

The United States also must deal with the occupation of Palestinian-held territories by Israel. The United States, following the 1973 war between Israel and Egypt, allocated \$2.2 billion in military aid to Israel. This infuriated the Arab world, whose governments in OPEC issued an oil embargo to punish the United States for siding with Israel. The Palestinians, dancing and celebrating following the attacks of September 11th, can be seen as a people who have felt oppressed by the Israelis, and who saw the attacks as a retribution for their suffering. Americans wonder why these people could celebrate such a tragedy. While the United States has historically assisted the Palestinian people, it has also aided Israel. The Palestinian plight is a symbol of western domination of Arab lands for many Arabs.

The situation in Palestine has always been a rallying cry for Arab nationalism and self-determination, as well as for radical Islamic groups. Many groups have formed in order to attempt to destroy Israel and return the area to Muslim control, as Jerusalem is the site of the Al Aqsa mosque, one of the three holiest sites in the Islamic world. In order to remove this motivation for terrorism, the United States must choose a course of action that will satisfy all sides, if possible.

Al Qaeda and the Business of Terrorism

Al Qaeda's conception has created a new paradigm in international relations. Terrorism has changed over the past decade, from a system in which the state was the unitary actor, whether being a sponsor or victim of terrorism, to a system in which the field was more pluralistic, with the introduction of more powerful non-state actors. Al Qaeda represents a means of organizing terrorism in a fashion similar to that of a multinational corporation, "a privatization of terrorism that parallels the movement of many countries in the past decade to convert their state-supported industries to privately held companies" (Bergan 38).

The organization's limited bureaucracy allows it to be much more mobile, as well as flexible in relation to its ability to spread its message. Al Qaeda's bases have moved from Afghanistan to the Sudan, and back to Afghanistan, to now being stationed in the frontier provinces along the border region of Afghanistan and Pakistan. Much like a multinational corporation, Al Qaeda has a base in one country; however, it has the capability to operate worldwide.

Compare this to another powerful terrorist organization, Hezbollah, which has always been headquartered in Lebanon. The acts of this organization have been confined to the immediate areas of Lebanon, where it is based even though it has managed to influence Shia Muslims worldwide as a rallying cry for their faith, and a means of retaliating for their perceived persecutions from non-Shias. Hezbollah, unlike Al Qaeda, has followed a more moderate path towards influencing change by participating in the local politics of democratic elections. The organization has also provided essential social services to the public in the areas in which it operates. This increases its legitimacy with the local population much more than terrorist attacks ever could. Hamas and the PLO are two other groups who have also followed this pattern.

While these groups have embraced the concept of democracy to some degree, it is unlikely that Al Qaeda will follow suit. Al Qaeda has fought viciously against the elected Iraqi government. Elections in Iraq may not be the best example of the conflict between democracy and Islamic core values, however, as the population in Iraq is predominately Shia, which does not favor the Sunnis, many of which follow an ideology similar to the fundamentalists. In Algeria, the GIA attempted to win popular elections in 1991. However, when the group appeared to be heading for victory in many key areas, the government canceled the election, which likely would have brought an Islamic regime to power. "This played right into the hands of the Salafi jihad position that trying to gain power through legal means was useless because the apostate government would never voluntarily relinquish power" (Sagemen 40).

The functions of the state have evolved over time. The notion of Al Qaeda being similar to a MNC is essentially valid in the absence of direct involvement of state actors. The closest Al Qaeda came to being sponsored by a state was when the Taliban were in power in Afghanistan. However, it appears that the relationship was more beneficial to the Taliban than to Al Qaeda. This can be compared to a situation wherein a high-level corporation, such as IBM, opens up operations in a third world country and creates jobs and thus stimulates that country's economy. Al Qaeda assisted the Taliban by providing funds, experience, manpower, an enhanced infrastructure and ideology. By sheltering the Saudi millionaire, the Taliban solidified its reputation as a firmly devout Islamic regime, which would not bow to the outside pressures involved with harboring Bin Laden. This gave them immense credibility with many radicals worldwide, and assisted them in enlarging their manpower. The regime also benefited from Bin Laden's construction prowess, as he helped to rebuild areas critical to the government's infrastructure.

The Al Qaeda-Taliban relationship is nearly identical to the relationship between Bin Laden and the Sudan when he initially moved to that country. In both cases, the presence of Al Qaeda was a mutually beneficial relationship. "Bin Laden agreed to help [Sudanese Islamic Leader]

Turabi in an ongoing war against African Christian separatists in southern Sudan and also to do some road building. Turabi in turn would let Bin Laden use Sudan as a base for worldwide business operations and for preparations for Jihad” (9-11 Commission, 57).

This is the common theme for Al Qaeda; it is welcome in countries that seek to benefit from the extreme fanaticism of its membership. The countries which have welcomed the organization have much in common. Both the Sudan and the Taliban governments had extreme forms of Islamic Sharia in place, both were faced with a civil war based on ideological, as well as racial and ethnic, differences within their populations, and both had very unstable governments. Bin Laden’s presence in these countries was economically beneficial as well, as he has always been a cunning businessman, although he was more interested in legitimate business in the Sudan than in Afghanistan.

The illustration below shows the various states where Al Qaeda has maintained a continued presence. Although Al Qaeda is known to operate in more countries, those listed appear to be the most important. These states mostly have secular governments, and sizable Muslim populations. Al Qaeda’s main goal is the restoration of the Caliphate, with Wahhabist Sharia law being instated. It is interesting to note that the United States is not included as a country that has a significant Qaeda presence.

Figure 1. Al Qaeda’s Presence in the World

Indonesia	Egypt	Uzbekistan	Afghanistan
Pakistan	Philippines	Chechnya (Russia)	The Sudan
Saudi Arabia	Yemen	Bangladesh	Somalia
Iraq	Algeria	Libya	Tunisia
Bosnia			



Note: Al Qaeda’s global reach surpasses the above illustration; however, these are countries where it has had greatest involvement.

Al Qaeda also has another important feature typical of some other non-state actors: hostility to the status quo. When states commit terrorism, such as the acts of genocide in Rwanda or Bosnia, they are intended to maintain the status quo. Organizations such as Al Qaeda have a revolutionary fervor, which seeks to change the status quo. This creates some problems with the actual definition of what terrorism is: “Is ‘functionary’ or establishment

terrorism to be justified because it seeks to preserve the status quo, whereas revolutionary terror to be condemned because it seeks political change?" (Kegley 19) The "Afghan Alumni" ("Afghan Alumni" and "Afghan Arabs" refer to the Arabs who fought or trained in Afghanistan during the war against the Soviet Union, and in the training camps set up afterwards), who comprise the leadership, as well as the vast majority of manpower for Al Qaeda, were considered by the West to be freedom fighters when they fought the Soviet Union. It is interesting to note that the guerrilla tactics utilized by Al Qaeda against the Soviets are similar to those employed against the U.S. forces in Afghanistan and Iraq. The difference is that Al Qaeda now employs more tactics and methods that are considered the norm for terrorism, such as car bombs.

The phenomenon of Al Qaeda combines modern technology with a centuries-old Wahabbist ideology. The use of the media has never before been as successful as its present use by Al Qaeda. By using the Internet and cable news services, Bin Laden has been able to transmit his global vision of jihad to Muslims throughout the world. His organization has managed to become somewhat of an umbrella organization for various Islamic movements, much like the PLO became the umbrella movement for the various organizations fighting for Palestinian statehood. The diversity of Al Qaeda is remarkable, unlike any other terrorist movement of its kind. The nationalities in Al Qaeda are a "rainbow coalition of Jordanians, Turks, Palestinians, Iraqis, Saudis, Sudanese, Morrocans, Omanis, Tunisians, Malaysians, Bangladeshis, Indians, Filipinos, Chechens, Uzbeks, Tajiks, Chinese, Uighurs, Burmese, Germans, Swedes, French, Arab-Americans, and African-Americans" (Bergan 30).

Al Qaeda's appeal to Muslims who feel alienated by the status quo maintained in their own respective countries cannot be denied. Many, who feel their own governments have become too secular and have deviated from the basic tenants of Islam, see Al Qaeda as a means of inciting revolution and thus bringing about the desired changes. This appeal is similar to that of the Muslim Brotherhood in Egypt, which was founded on these very principles. This organization provided the leadership responsible for the assassination of Anwar Sadat. The individuals who at one time were involved with that movement later joined Al Qaeda, which holds similar views. That is, both movements espouse the removal of leaders deemed to have abandoned their Islamic faith and as a consequence have become corrupt.

Al Qaeda, translated to mean "the base," was originally known as the Afghan Services Bureau. The organization was responsible for the transportation, training, and housing of many of the Afghan-Arabs who fought the Soviets in Afghanistan. The organization also provided the families of these individuals a means of knowing where their loved ones were. "Bin Laden realized that there was little documentation to give to the families of those missing in Afghanistan; to solve this problem, he set up Al Qaeda to track those who were full-fledged Mujahideen (holy warriors)" (Bergan 59). The organization however also enabled Bin Laden to maintain access to his fighters so that "the Afghan Services Bureau became a network that linked returning Afghan war veterans in Algeria, Chechnya, Bosnia, Egypt, and the Philippines" (Clarke 60). The men brought in were extremely loyal to Bin Laden, whom they saw as a true Muslim, sacrificing the luxuries of his wealth to fight in the jihad against the Russians. "Osama the lion was lionized for leaving behind the typical Saudi millionaire's life for the dangers of war in Afghanistan" (Bergan 57).

The warriors who fought in Afghanistan became radicalized in their faith. They also saw their cause as just, being the underdogs fighting a superpower, yet God had delivered them victory. Many of these men would not be welcome home, however. Essam Deraz, a filmmaker who filmed Bin Laden during the war, told Bin Laden and his soldiers "one day you are all going to prison" (Bergan 58). This was because "Middle Eastern governments hate any kind of popular

movement" (Bergan 58). Several of these soldiers were already condemned, such as Ayman Al Zawahiri, Bin Laden's number-two man. Zawahiri was involved in numerous terrorist attacks in Egypt by the feared group Al-jihad.

Clearly a dim future awaited these men who had fought in the anti-Soviet jihad. With few places to go, most stayed with Bin Laden, or returned to their home countries and, with a renewed spirit of conviction, proceeded to attack their own governments, deemed un-Islamic. From this source, Bin Laden has gained large amounts of manpower. His connections with these various groups have enabled him to draw upon a wide variety of sources. Many of these groups sent their soldiers to train at Bin Laden's camps in Afghanistan.

Another source of manpower for Bin Laden is the Madrassa. Madrassas are religious schools, usually Wahabbist, whose sole curriculum is the memorization of the Koran, as well as the Haddith, or sayings of Mohammed. These schools have been a convenient tool for some regimes, which have been deemed as apostates from Islam, to support terrorist movements yet officially deny their connection with terrorism to their Western allies. Saudi Arabia and Pakistan are the prime nations in this area. "The House of Sa'ud climbed aboard the bandwagon even before it was fully built. Beginning in the early 1970s, the royal family and charities administered by family members used their vast reservoirs of petrodollars to build a network of mosques and religious schools, in the kingdom and abroad, where a fresh generation of Muslim teenagers could be indoctrinated into the most violent and radical interpretation of Islam" (Baer 2003, 88-89). The newly trained Muslims were eager to apply their lessons of holy war, and Al Qaeda provided an opportunity to do just this.

As mentioned, Pakistan is also involved with these schools. The original intent of the Madrassas was to provide freshly Wahabbist-indoctrinated youth as manpower to the ongoing jihad against the Soviet Union. "The Peshawar region on the border with Afghanistan became a breeding ground for Islamic terror organizations that recruited Muslims" (Shay 98). Initially, this was also a means for the former Pakistani dictator, General Zia Ul-Haq, to enhance his image as a devout Muslim. "During the 11-year reign of General Zia Ul-Haq, the dictator decided that as he squashed political dissent he needed allies. He found them in the fundamentalists. With the aid of Saudi financiers and functionaries, he set up scores of Madrassas throughout the country. They brought him legitimacy but have eroded the social fabric of Pakistan" (Zakaria, 2001). These were the schools which would eventually provide the majority of the Taliban's manpower. The Pakistani government has failed to provide any alternative sources of education for Muslim youths in this area, which has resulted in the Madrassas being the only avenue for education.

Nevertheless, it is important to not underestimate the overall educational level of Al Qaeda members simply because a large portion of recruits come from Madrassas. These individuals rarely achieve significant leadership in the organization. Much like a corporation, Al Qaeda's leadership tends to be highly educated. Bin Laden, Ayman Zawahiri, Khalid Sheik Mohammed, and even Mohammed Atta all received at least four years of instruction at a university. Another interesting fact is that some of the suicide bombers who have carried out operations for Al Qaeda were "not, however, impoverished suicide bombers of the type seen in the Palestinian intifada. Instead they were generally well educated, technically savvy young men" (Bergan 28).

One of the biggest problems in dealing with the Al Qaeda phenomenon is to understand how the organization is able to finance its operations in the absence of visible state sponsors. In previous decades, secular Arab governments associated with the Palestinian movements proudly supported the operations of these groups. Even non-Arab states such as the Soviet Union provided some assistance. "The Middle Eastern terrorist groups of the 1970s and 1980s

needed the patronage of states to supply the money and infrastructure that allowed them to do business” (Bergan 38). It is through the indirect support of terror via Madrassa that Arab states provide resources to Al Qaeda.

These Arab states, however, face a threat now partially of their own creating. Al Qaeda itself seeks to overthrow these very regimes; therefore, funding the organization is an invitation to disaster. Saudi Arabia attempted to have it both ways by funding the Madrassas, but now it faces terrorism from its own citizenry who have joined Al Qaeda. “It is ironic that billions of dollars of Saudi government aid went to a cadre of well-trained militants who would later turn on the Saudi royal family. This is part of a continuing larger pattern of Saudi funding of militant Islamic organizations, known as *riyalpolitik*, which is supposed to shore up Saudi legitimacy, but actually undermines it, because it funds the very groups most opposed to the regime” (Bergan 55-56).

A frequently used system of laundering money in the Middle East is the Hawala system. Hawala is “an ancient underground system that offers money transfers without money movement – and virtually no paper trail” (Clarke 192). Think of going to the gas station and using Western Union. You pay money to the cashier, who then sends information over the Internet to another location, where the money can be picked up. Hawala is not unlike this method. All that is needed is money on both ends and a means of communication. One party pays the individual, who then calls another individual, likely in another country, and that individual pays the intended recipient. This method is remarkably simplistic, yet quite effective in eliminating a paper trail for investigators to follow. This system has served Al Qaeda well in allowing it to maintain its funding without being tracked.

A common misconception is that killing Bin Laden could be the end-game for the war on terrorism. While killing or capturing Bin Laden would be a devastating blow for Al Qaeda, it would not eliminate the massive movement which Bin Laden spearheaded. There have been thousands of fanatics trained in Al Qaeda camps in Pakistan, Afghanistan, and Sudan. Bin Laden’s limited immediate leadership abilities cannot possibly control this vast network.

It appears as though the real central authority of Al Qaeda is its ideology, and not its physical leaders. Al Qaeda soldiers are trained in camps and usually return back to their own countries, where they will engage in the arts of jihad which they have learned at the camps. The indoctrination through the learning of extreme Wahabbist principles is used to show the adherents how far their own respective governments have strayed from the tenets of the Islamic faith. The believer is then advised on how to take action against their government, and then how to implement a good and just Islamic system, in keeping with Wahabbist ideals.

The most interesting question is: how many of the attacks over the past 15 years can really be physically attributed to Bin Laden? While there is compelling evidence that does in fact link Bin Laden to a fair number of attacks, a great many others do not. These attacks, however, do have Al Qaeda’s fingerprints, although not specifically Bin Laden’s. His war on the West has inspired a generation of fanatics. How then can the international community fight this war when it is a war of ideas, and not a war of men?

Conclusion

Changes in a unipolar world

The world has changed drastically since the fall of the Soviet Union. The days of the two great superpowers engaging each other in an arms race and proxy wars around the globe are over. The unipolar world appears to be more complicated with the present conflict between Islamic radicals and democratic ideals. When considering the threat of modern terrorism, one must understand these changes. Three points are particularly important:

1. The United States is now at the center of the world in nearly every aspect of international relations.
2. Non-state actors are becoming more involved, and much more important.
3. Religion is no longer suppressed by communism, and now has grown into a more powerful ideological tool than it was previously.

The war on terror is a mostly ideological war

The war in Iraq is presently the central location for the war against Al Qaeda. The United States is engaged in a battle between democratic ideals and Islamic fundamentalism. There is little evidence to support the theory that Al Qaeda existed in great numbers in Iraq before the U.S.-led invasion. Unfortunately, the war in Iraq appears to have the unintended consequence of providing the enemies of the West with valuable propaganda. Considering the fact that the jihadists are driven by ideology, it is difficult to understand what steps will be necessarily efficient in dealing with them. It is important to know what factors guide their ideological grievances with the West. The following illustrates the primary grievances for Islamic radicals:

1. U.S. support for Israel
2. The presence of foreign troops on Muslim lands
3. The basic ideological differences that exist between contemporary fanatical Wahhabists, non-Wahhabi Muslims, and the predominately Christian West
4. U.S. support for corrupt Arab regimes which stand in the way of uniting the Muslim world under strict Sharia law

Questions which must be addressed in defeating terrorism

1. How to deal with the origins of the ideology which drives the terrorists?
2. What to do with Arab regimes whose corruption impoverishes their citizenry, and gives credibility to the complaints of the Mullahs that preach anti-Americanism?
3. How to balance the use of force with smart diplomacy?

Recommendations that deal with these questions include effective force, counter-productive force and diplomacy. In some instances, war is the most efficient alternative, as in Afghanistan. The removal of a safe haven and base of terrorist operations is essential to uprooting the enemy and putting it on the run. There are many who will never cease in their pursuit of holy war against the West, and those who insist on attacking innocent people, whether civilian or military, must be defeated militarily. The act of war, however, cannot solve all of the problems which the West is dealing with, and may sometimes be counter-productive. In fact, invading Muslim lands gives credibility to the enemies of the West. The unavoidable collateral damage kills innocent civilians, and causes the ranks of the terrorists to swell in numbers. This brings us to diplomacy. When using the art of diplomacy, it is important to make note of the historical background of the Islamic world. There are moderate elements in these countries which seek modernization, and are opposed to any strict form of Sharia law being implemented. These elements are the ones which inevitably must defeat the radical jihadists. The United States must always support

these elements in their fight, as is the case in Iraq. In Afghanistan, the U.S. foreign policy failed to support the moderate Ahmad Shah Massoud against the Soviets, opting instead to allow Pakistani intelligence to give the majority of support to the unpredictable warlord, Gulbideen Hekmatyar. Hekmatyar, a radical jihadist, proceeded to destroy the country. The legacy of lawlessness left behind from the civil war started by Hekmatyar aided the rise of the Taliban. The United States still failed to support Massoud fully until September 9, 2001, when he was killed by an Al Qaeda suicide bomber. The moderate elements in Muslim societies must be supported in order to prevent the country they reside in from turning into a terrorist haven.

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Memory for Emotional Words: Slow versus Fast Attention

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The emotional response to an experience has a large impact on memory for that experience. Emotional narratives are remembered better than comparable neutral narratives (Laney, Campbell, Heuer, & Reisberg, 2004), a series of emotional slides is better remembered than a neutral series (Heuer and Reisberg, 1990), emotional words are remembered better than neutral words (Kleinsmith and Kaplan, 1963), and emotional life experiences may lead to detailed “flashbulb” like memories (Brown and Kulik, 1977). There are numerous theories to explain the impact of emotion on memory, including the “attention narrowing” hypothesis (Easterbrook, 1959), Christianson’s (1992a; 1992b) two stage model, and most recently, MacKay’s “binding hypothesis” (MacKay, Shafto, Taylor, Marian, Abrams, and Dyer, 2004). These hypotheses have in common the idea that emotional material captures and holds the attention of the observer, often at the expense of peripheral material. For example, Christianson argues that an emotional event leads to an automatic, pre-attentive response during which the emotional content of the event is extracted. Later, controlled-elaborative processes lead to increased storage of information central to the event to the detriment of surrounding information.

However, some argue that emotional materials are often distinctive, and as such, at least some of the memory effects attributed to emotion results from item distinctiveness (McCloskey, Wible, and Cohen, 1988, Schmidt, 2002). Similarly, Reisberg and Heuer (2004) suggest that emotional materials often (but not always) contain “attention magnets” that impair processing of background information. Still others are of the view that good memory for emotional words is simply an artifact resulting from differences in the ease of organizing emotional and neutral words (Talmi and Moscovitch, 2004). The research presented below is designed to investigate how emotion, attention, and item distinctiveness combine to influence memory for words. We begin with a brief review of research concerning memory for lists of emotional versus neutral words. This is followed by a review of evidence suggesting that emotional words capture and hold attention as measured by the Stroop color-naming task. Both reviews suggest that taboo words are processed differently than other negative-affect emotional words. Three experiments are then presented that explore the relation between attention and memory for taboo words, non-taboo emotional words, and neutral words.

Memory for Emotional Words

There is a long history of research comparing memory for emotional versus neutral words. Early researchers investigated paired-associate memory for emotional words, with much of their focus on whether the superior recall of emotional over neutral words required a delayed retention interval (Kleinsmith and Kaplan, 1963; 1964; Maltzman, Kantor, and Barry, 1966). However, it also became apparent that experimental design was a moderating factor in the influence of emotion on memory (Walker and Tarte, 1963). Most researchers employed heterogeneous or mixed lists of emotional and neutral words. When memory for a homogeneous list of emotional words was compared to a list of neutral words, the memory advantage typically enjoyed by the emotional words disappeared (Dewhurst and Parry, 2000).

A number of stimulus variables have different impacts on memory performance in mixed and between-list manipulations, including orthographically unusual versus common words (Hunt & Mitchell, 1982), bizarre versus common sentences (McDaniel and Einstein, 1986), humorous sentences and cartoons versus non-humorous material (Schmidt, 1994, 2001), frequent versus infrequent words (Delosh and McDaniel, 1996) and long versus short words (Hulme, Surprenant, Bireta, Stuart, and Neath, 2004). A common interpretation of effects found in only mixed-list designs is that they result from item distinctiveness (e.g., McDaniel and Einstein, 1986). If emotional words are only better remembered than neutral words in mixed lists, then it is tempting to attribute the putative effects of emotion to item distinctiveness (Dewhurst and Parry, 2000).

In addition to concerns about experimental design, researchers are concerned that emotional words often form a conceptual group. If memory for a list of emotional words is compared to a list of unrelated neutral words, the emotional material may benefit from organizational processes that have a powerful impact on memory independent of emotional content (Mandler, 1967). Talmi and Moscovitch (2004) carefully control for the organizational structure of the emotional and neutral lists. Three lists are employed: an emotional list, a list of random neutral words, and a list consisting of words from a single conceptual category and matched to the emotional list in semantic relatedness. They find that the emotional list is better recalled than the random neutral list, but the emotional and the related-neutral list are equally well recalled. Unfortunately, Talmi and Moscovitch (2004) only employ a between-list design. Other researchers compare memory for emotional words to single category neutral words in mixed lists and find the typical recall advantage for the emotional words (e.g., Manning and Goldstein, 1976).

Research concerning memory for emotional words is further complicated by evidence that good memory for emotional words may result from only a small subset of the words employed (Manning and Goldstein, 1975). Compared to neutral words (from a single category), words associated with sex and the bathroom are well remembered, whereas words associated with violence are remembered at the same level as the neutral words (Manning and Goldstein, 1976). McNulty and Isnor (1967) report that pleasant words are recalled more easily than unpleasant words. Faces with negative expressions lead to a larger proportion of remember responses than positive or neutral expression faces (Johansson, 2004). Apparently, emotional items belong to several subclasses, each of which may have a different impact on memory performance. Taboo words (vulgar sexual references, racial taunts, and other words forbidden in polite company and on network TV) appear especially potent. Kensinger and Corkin (2003) demonstrate that taboo words lead to greater recognition than both negative affect emotional words and neutral words. In addition, taboo words more frequently lead to remember responses than negative and neutral words. Furthermore, Pesta and Sanders (2001) show that taboo words are less susceptible to false memories than neutral words.

The Emotional Stroop Effect

Attempts to separate classes of emotional words may benefit from measures of the attention directed toward the words during presentation. Stroop's (1935) color-naming task may serve as an indirect measure of that attention. In the emotional Stroop effect, emotional words are printed in different ink colors, and the participants are asked to name the ink color, ignoring the word. Ink naming emotional words is often slower than ink naming comparable neutral words (see Williams, Mathews, and MacLeod, 1996, for a review). One interpretation of the emotional Stroop effect is that the emotional words lead to a pre-attentive response. That is, they automatically attract attention, distracting the participants from the color-naming task, and thus slowing the ink naming time of the emotional words relative to the neutral words. Thus, the emotional Stroop effect may measure the pre-attentive process described by Christianson two-stage model (1992a; 1992b). Furthermore, McKenna and Sharma (1995) report an emotional Stroop effect for negative but not for positive emotion words – this may provide an explanation for why memory effects vary for different types of emotional words.

McKenna and Sharma (2004) challenge the idea that emotional words lead to a fast, pre-attentive, response that slows color naming. They argue that in many studies of the emotional Stroop effect, words of a given type (emotional or neutral) are presented in blocks. For example, participants may name the ink color of a block of 40 emotional words, followed by a block of 40 neutral words. In a homogeneous block of words, the processing of an emotional word may “carry over” to the presentation of the next emotional word. The slow reaction times to the ink naming of the emotional words may result from this relatively slow, post-attentive response to the emotional words. To test this hypothesis, McKenna and Sharma (2004) present either an emotional or a neutral word followed immediately by six neutral words, and measure the ink naming times for all seven words in many such series. The next word in the series is presented immediately following the participant's response, yielding relatively short inter-stimulus intervals (ISI's). Ink naming times are equivalent for the emotional and neutral words. However, response times are slower to stimuli following emotional words than following neutral words. They conclude that the emotional Stroop effect resulted from a relative slow shift in attention to the emotional word after color naming has occurred, reducing attention to the next word in the series. Perhaps McKenna and Sharma are measuring the controlled elaborative process described in Christianson's two-stage model.

MacKay, Shafto, Taylor, Marian, Abrams, and Dyer (2004, Experiment 1) also investigate the emotional Stroop effect, and employ it to determine the impact of emotional stimuli on attention and memory. Several aspects of their design are particularly interesting. First, each new word is presented three seconds after the participants name the ink of the preceding word. This long ISI should reduce carry-over of the processing of one word to the next. Second, they present the words in random order (rather than blocked). With a random presentation, any carry-over from one word to the next will be equally likely to fall on a neutral word as on an emotional word. Fourth, the emotional words are taboo words likely to lead to strong emotional responses. Finally, they follow the ink-naming task with a free recall memory test for the words. MacKay *et al* demonstrate slowed ink naming of taboo words, and because possible carry-over effects are minimized in their design, these results should be attributed to the fast, pre-attentive, response to taboo words. In addition, increased ink naming times are associated with increased memory performance, providing a link between attention and memory. Unfortunately, these researchers compare the Stroop and memory performance of their taboo words to a random list of neutral words.

Apparently McKenna and Sharma (2004) and MacKay *et al* (2004) were studying two different Stroop effects: the “taboo Stroop effect” that results from a fast pre-attentive processing of threatening stimuli (i.e., taboo words), and the emotional Stroop effect that results from a relatively slow, voluntary selective attention to non-threatening but emotionally significant stimuli. Furthermore, these two different attentional responses may help explain differences in memory performance for taboo and non-taboo emotional words. Perhaps taboo words lead to a fast attention response, and this response supports good memory for taboo words independent of experimental design. However, non-taboo emotional words may only lead to the slow, post attention elaborative processing. Perhaps this processing serves to distinguish the emotional words from other items in the list, and thus only supports good memory for the emotional words in mixed-list designs. For lack of a better name, we will call this the *two-factor theory* of the effects of emotion on memory. Support for this hypothesis would have important implications for the effects of emotion on memory, for the role of attention in memory, and for explanations as to why some mnemonic variables only influence memory performance in mixed-list designs.

Experiments 1a and 1b

There were three specific goals of the first experiments. First, we wished to replicate the MacKay *et al* (2004) study demonstrating a Stroop effect for taboo words with a long ISI and random presentation. Second, we were interested in extending the memory aspects of the MacKay study by comparing memory for taboo words to memory for easily organized neutral words. And third, we wished to compare the Stroop and memory effects in a mixed-list design (Experiment 1a) to those in a between-list design (Experiment 1b). If the taboo memory effect is the result of item distinctiveness (Dewhurst and Parry, 2000), then the effect should only be observed in the mixed-list design. On the other hand, if the memory effect results from differences in organization between taboo and neutral list, then we should fail to observe a taboo memory effect in both the mixed- and between-list designs. Alternatively, if taboo words lead to a fast pre-attentive shift in attention, then we may observe a taboo Stroop effect and enhanced recall of taboo words in both mixed- and between-list designs.

Method

Participants. Experiment 1a was conducted during the spring semester of 2005 with 34 participants recruited from the psychology research pool at Middle Tennessee State University. Sixty-six students, enrolled in the following summer term, participated in Experiment 1b. Previous researchers have argued that, for equivalent power, between-subjects’ contrasts should include approximately twice the number of participants as within-subjects’ contrasts (Erlebacher, 1977; McDaniel and Einstein, 1986; Schmidt, 1994). Participants received extra credit in their classes to participate in the research.

Materials. Twenty taboo words were selected from the MacKay *et al* study, which defined taboo words as profanities, insults, racial slurs, or sexual references. In addition, participants in the current study gave high ratings of profanity to the words. Neutral words were selected from the “clothing” category in the Battig and Montague (1969) category norms. Clothing words were matched to taboo word based on the number of letters, syllables, and first letter. Four taboo words that were difficult to pair with clothing words served as practice words in the Stroop task. The experimental words were divided into two lists, with each list containing eight words from each category, and the two lists matched in word length. Half of the participants in Experiment 1a saw list one, whereas half of the participants responded to list two. In Experiment

1b, the 16 taboo words were combined to form one list for one group of participants, and the 16 matched clothing words served as materials for the second group, creating the between-subjects manipulation of word type.

To insure that our taboo and neutral words were matched in category organization and accessibility, a pilot study was conducted employing a simulated recall procedure (see Schmidt, 1996). Forty-nine students from the research pool were asked to generate words from the clothing and taboo categories. The word categories were defined for the participants, and the practice words were given as examples of category members. Approximately half of the participants were asked to list clothing words first, and then, following a short break, they were asked to list taboo words. The remaining participants generated words in the reverse order. The students were given three minutes to try to generate words from each category. The resulting recall protocols were then scored for the presence of our experimental words. The participants generated an average of 2.50 clothing words from list 1 and 2.42 from list 2. The corresponding means for taboo words were 2.02 and 1.93. The effect of list was not significant, $F(1, 46) = .34$, $MSE = .897$. More of our clothing words ($M = 2.46$ per list) were generated than taboo words ($M = 1.98$ per list), $F(1, 46) = 7.12$, $MSE = .897$. These results suggest that more of our selected clothing words were accessible from category level information than our taboo words.

Procedure. Participants started by completing a consent form warning that some of the words might be offensive. They then completed 40 practice Stroop trials. In Experiment 1a, practice trials were conducted with two taboo and two neutral words. In Experiment 1b, practice trials contain four words of the same type as were seen in the experimental trials. Each practice word was presented twice in each of the five font colors (red, yellow, green, blue, and gray). Practice was followed by 160 experimental trials. In Experiment 1a, the experimental trials contained eight taboo and eight neutral words, each presented twice in each font color. In Experiment 1b, the experimental trials contained either 16 taboo or 16 neutral words in the between-subjects manipulation. Each participant received an independent random order of the experimental trials. Each trial began with a black cursor in the center of a light gray screen for 1,000 msec. Next, one of the stimuli appeared in the center of the screen. The participant responded by saying the color of the word into a microphone, and a voice key measured their reaction time. A tape recorder recorded all verbal responses. After the participant's response, the screen went blank for 2,000 msec, followed by the next trial. A Dell computer running E-Prime software controlled the presentation of the stimuli. Once the experimental trials were completed, participants were asked to spend three minutes trying to recall the words from the experimental lists. The memory test was unexpected. McKenna and Sharma (2004) report that a 1,000 msec ISI is sufficient to minimize carry-over from one word to the next. In addition, the random presentation in the mixed lists (Experiment 1a) should insure that any carry-over that might occur would fall equally on taboo and neutral words.

Results and Discussion

In the within-subjects design, reaction times to taboo words ($M = 708.30$ msec) were significantly slower than reaction times to neutral words ($M = 681.59$ msec), $F(1, 32) = 40.03$, $MSE = 303.12$ (a $p < .05$ was adopted for all significance tests). The proportion of correct color naming responses for taboo and neutral words was equivalent ($M = .96$), $F(1, 32) = .35$, $MSE = .0007$. The proportion of taboo words recalled ($M = .67$) was significantly greater than the proportion of neutral words recalled ($M = .39$), $F(1, 32) = 51.23$, $MSE = .03$. These results replicate the MacKay *et al* study, showing slower reaction time to taboo words than to neutral words and superior recall of taboo words over neutral words in a mixed-list design.

Table 1. Ink naming times, percent recall, and average percentile output position in recall in Experiment 1 for taboo and neutral words.

Word Type	Taboo	Neutral
Mixed List (Experiment 1a)		
Naming Time (msec)	708	682
Recall	.67	.39
Output Percentile	55.8	52.2
Between List (Experiment 1b)		
Naming Time (msec)	725	690
Recall	.57	.44

We were concerned that participants in the between-subjects design might habituate to taboo words over the series of 160 color naming trials. To address this concern, the color naming times were broken into two blocks of 80 trials. These results failed to show a significant effect of condition, $F(1, 58) = 1.56$, or block, $F(1, 58) = 1.79$. However, condition by block interaction was significant, $F(1, 58) = 7.70$, $MSE = 901.72$. Subsequent t-tests demonstrated that in block 1 reaction times to taboo words ($M = 729.08$) were significantly slower than the reaction times to neutral words ($M = 678.65$), $t(58) = 1.89$, $SE = 26.67$. In block 2, reaction times to taboo words ($M = 721.21$) were not significantly slower than reaction times to neutral words ($M = 701.20$), $t(58) = .651$, $SE = 30.73$. Note that the interaction between word type and block primarily resulted from participants slowing in response to neutral words, while remaining relatively constant on taboo words. As in the within-subjects design, the proportion of correct naming responses was equivalent across the taboo ($M = .97$) and neutral ($M = .96$) conditions, $F(1, 58) = .25$, $MSE = .0009$.

The proportion of taboo words recalled ($M = .57$) was significantly greater than the proportion of neutral words recalled ($M = .44$), $t(58) = 3.12$, $SE = .0421$. These results extend the taboo Stroop and taboo memory effects to a between-subjects design. To further explore the effects of experimental design, the proportion of taboo and neutral words recalled was compared across the two designs. A larger proportion of taboo words was recalled in the within-subjects design ($M = .67$) than in the between-subject design ($M = .57$), $t(62) = 2.47$, $SE = .0415$. In contrast, a larger proportion of neutral words was recalled in the between-subjects design ($M = .44$) than in the within-subjects design ($M = .39$), but this difference was not significant, $t(62) = 1.01$, $SE = .0452$.

The results of Experiment 1 are particularly damaging to a distinctiveness interpretation of the effects of emotional words on memory (Dewhurst and Parry, 2000). According to this interpretation, the taboo memory effect results from the contrast between taboo and neutral words presented within the same context. It is true that the taboo memory effect was smaller in the between- than in the within-subjects design — suggesting some role of distinctiveness. However, the effect was still robust in the between-subjects design. The results were also damaging to an organizational explanation of the better memory for emotional than neutral words (Talmi and Moscovitch, 2004). The neutral words were selected from an easily recognized conceptual category. The neutral words were more easily accessed from category level information than the taboo words. Furthermore, participants were more likely to intrude neutral than taboo words. Another hypothesis is that the taboo memory effect results from retrieval processes that give high priority to the recall of the taboo words. The larger taboo memory effect in the mixed-

than in the between-list might be due such a retrieval bias. However, the analysis of output order in the mixed list failed to support this hypothesis.

Perhaps the taboo words capture attention early in the stream of information processing (the fast attention response), and this extra attention supports good memory. Support for this hypothesis was found in the taboo Stroop effect reported above. It is also possible that the taboo words held the attention of the participants longer than the neutral words (the slow attention response). The long ISI's employed in this experiment may have prevented observation of this slow response in the color-naming task. Thus, the taboo memory effect may result from both a fast, pre-attentive response, as measured by the Stroop effect (with long ISI's), and a slow-selective attention to the taboo words.

Experiment 2

Experiment 2 was designed to explore the relation between the emotional Stroop effect and memory with negative-affect, non-taboo, emotional words. McKenna and Sharma (2004) argue that the emotional Stroop effect does not result from a fast pre-attentive response to the emotional words. Experiments 1a and 1b, as well as the results reported by MacKay *et al* (2004) counter this conclusion when taboo words serve as the emotional stimuli. However, McKenna and Sharma (2004) investigate the Stroop effect with non-taboo negative words. McKenna and Sharma (2004) also use key-press responses in their task. Sharma and McKenna (1998) conclude that different response modes are sensitive to different components in the Stroop task. Because of the different response modes, and other potential differences in the procedures, it is premature to conclude that an emotional Stroop effect with non-taboo words would not be found in our design. In addition, McKenna and Sharma (2004) do not follow their Stroop task with a memory test (however, see McKenna and Sharma, 1995). For these reasons, Experiment 1a reported above was repeated with negative-affect emotion words and clothing words serving as stimuli.

Experiment 2 enabled us to test several hypotheses. First, perhaps we will fail to observe an emotional Stroop effect, replicating McKenna and Sharma (2004). In addition, memory for negative non-taboo emotional words may be similar to memory for an easily organized list of neutral words, supporting the conclusions of Talmi and Moscovitch (2004). This pattern of results would serve to reinforce the interesting connection between the Stroop effect and subsequent memory performance. A second idea is that attention is directed to non-taboo emotional words relatively slowly, and thus does not directly interfere with the color naming of a word. However, this slow shift in attention may interfere with the color naming of the next word in the series, and may support good memory for the emotional words. In Experiment 2 we compared blocked and random presentations of the emotional and neutral stimuli to investigate these potential carry-over effects. Blocked presentation should yield a larger Stroop effect than a random presentation if any carry-over is occurring (Waters, Sayette, and Wertz, 2003). Furthermore, extra processing in support of memory should impair processing of other words within the immediate temporal vicinity of the emotional words. In blocked presentation, increased attention to one emotional word would thus reduce attention for another emotional word, potentially wiping out or reducing the memory differences between emotional and neutral words. If such carry-over processing is important to the emotional memory effect, there should be a larger emotional Stroop effect in blocked than in random presentation, but a smaller memory effect following blocked than following random presentation.

A third idea is that the enhanced memory for non-taboo emotional words is not the product of increased attention to emotional words at the expense of neutral words. Rather, emotional

words are distinctive in a retrieval context that contains both emotional and neutral words. This hypothesis predicts an emotional memory effect that is independent of the emotional Stroop effect. Furthermore, emotional words should be distinctive relative to neutral words in both blocked and random presentations (see McDaniel and Einstein, 1986, for an application of this logic to bizarre and common sentences).

Method

Participants. Experiment 2 was conducted with 61 participants. Participants were recruited from the psychology research pool at MTSU and received extra credit in their classes to participate.

Materials. Emotional words were selected from the lists used by McKenna and Sharma (2004, Experiment 1). Neutral words came from the category “clothing” in the Batting and Montague (1969) category norms. The stimuli were matched on word frequency and length. The Kucera and Francis (1967) norms and three Internet search engines (Yahoo, Google, and Alta Vista) were employed to match the frequencies of emotional and neutral words. Blair and Urland (2002) have shown that Internet search engines produce comparable results to Kucera and Francis. Two mixed lists were generated by assigning half of the words of each word type to each list, holding word length and frequency constant across list. Twenty-eight participants saw list one and 33 participants saw list two.

Procedure. The procedure for Experiment 2 was very similar to Experiment 1. As in Experiment 1, participants began with practice trials to familiarize themselves with the procedure. The practice trials consisted of two emotional and two neutral words. Each word was presented twice in each of the five colors for a total of 40 practice trials. For approximately half of the participants, the two word types were randomly ordered, following the procedure of Experiment 1a. Word types were presented in blocks for the remainder of the participants. Practice trials for the blocked presentation consisted of four blocks, with each block containing 10 trials. A block of experimental trials consisted of 40 trials, with two emotional and two neutral blocks presented in random order. Each word was presented once in each color in each block. The order of the blocks was random in both the practice and experimental trials. Each trial began with 1,000 msec fixation point in the center of a light gray screen, followed by the stimulus word. After the participant responded to the color of a stimulus, the screen went blank for 2,000 msec, followed by the next trial. In the blocked presentation, there was an extended delay of 5,000 msec between blocks. Once the experimental trials were completed, participants were asked to spend three minutes trying to recall the words from the experimental lists. As in Experiment 1, the memory test was unexpected.

Results and Discussion

A summary of the results appears in Table 2. There was little evidence for an emotional Stroop effect in Experiment 2, with mean ink naming times equal to 707 msec for emotional words, and 694 msec with neutral words, $F(1, 52) = 1.32$, $MSE = 6898$. In addition, the interaction between list order (blocked versus random) and word type was not significant, $F(1, 52) = 2.20$, $MSE = 6898$. Although the effect of word type was numerically larger in the blocked than in the random presentation (see Table 2), the effect of word type was not reliable even in the blocked presentation and employing an LSD test, $t(28) = 1.35$. As in Experiment 1, the proportion of correct responses for emotional ($M = .96$) and neutral ($M = .95$) were equivalent, $F(1, 52) = 1.97$, $MSE = .0006$. The absence of an emotional Stroop effect with negative-affect, non-taboo words supports the conclusions of McKenna and Sharma (2004).

That is, with these types of stimuli, the emotional Stroop effect results from a carry-over from one word to the next in a block of rapidly presented stimuli. The relatively long ISI's employed in this experiment prevented us from observing this slow shift in attention, even in the blocked presentation.

Table 2. Ink naming times, percent recall, and average percentile output position in recall in Experiment 2 for emotional and neutral words.

Word Type	Emotional	Neutral
Random Presentation		
Naming Time (msec)	700	704
Recall	.44	.34
Output Percentile	57.1	47.8
Blocked Presentation		
Naming Time (msec)	715	685
Recall	.42	.33
Output Percentile	57.8	54.1

The initial analysis of recall included all participants, including participants with a high proportion of errors on the Stroop task and participants with missing reaction time data. A second analysis was then repeated including only those participants with valid reaction time data. Because both analyses led to the same conclusions, we report only the one including all participants. A larger proportion of emotional words ($M = .43$) was recalled than neutral words ($M = .34$), $F(1, 57) = 9.15$, $MSE = .0305$. In addition, there was no evidence of an interaction between type of word and the blocked versus random method of presentation, $F(1, 57) = .04$, $MSE = .0305$ (see Table 2). Thus, our results do not support the idea that easily organized neutral words have similar memory to emotional words (Talmi and Moscovitch, 2004). To address more fully an organizational explanation of our results, we scored recall of words from the inappropriate lists. That is, if a participant saw list 1, how many list 2 emotional and neutral words did that participant recall? Our reasoning was as follows: if our emotional words form a more cogent conceptual class than our clothing words, then participants should incorrectly recall more emotional words from the inappropriate list than clothing words. Interestingly, there was a non-significant trend to recall more neutral ($M = .17$) than emotional words ($M = .07$), $F(1, 57) = 3.07$, $MSE = .0972$, from the inappropriate list.

In summary, Experiment 2 failed to find evidence for an emotional Stroop effect with non-taboo words, challenging the idea that emotional words receive increased attention at encoding. Nonetheless, emotional words were recalled better than neutral words in both random and blocked mixed-list presentations. This memory effect was not easily explained by differences in the ease of organizing the emotional and neutral words. One explanation of these finding is that the emotional words were distinctive in the context of the neutral words. Of course, it is possible that emotional words received greater attention than neutral words, but this extra processing occurs after the ink naming was completed and before the presentation of the next word. This possibility was explored in Experiment 3.

Experiment 3

The results of experiments 1 and 2 led us to conclude that different attention and memory processes are directed toward taboo, non-taboo emotional, and neutral words. Experiment 3 was designed to provide a direct comparison across these three types of materials. In a between-list and between-subjects manipulation of word type, participants performed a Stroop task followed by an unexpected recall task. During the Stroop task, the ISI was shortened by removing two seconds from the time interval between each response and the presentation of the next stimulus. With the shorter ISI, we hoped to observe carry-over from the processing of one emotional word to the next. Thus, we expected a relatively large taboo Stroop effect resulting from both the pre-attentive response to the taboo words and from the carry-over from one taboo word to the next in the series. We also expected a small but reliable emotional Stroop effect resulting from the slow attention response that carries over from one emotional word to the next. On the free recall test, we expected to replicate Experiment 1b, demonstrating greater recall of taboo than neutral words that is a direct function of the fast-attention response.

Memory comparisons were made between the emotional and the neutral words. Perhaps attention is directed relatively slowly toward emotional words, and this attention can only be observed in a Stroop task with relatively short ISI's. According to this differential-attention hypothesis, emotional words should be remembered better than neutral words in both mixed- and between-list designs. Even if emotional words steal attention from other emotional words in the list, with repeated presentation of each word, one might expect that the cumulative effect of the greater attention given to the emotional words than neutral words would lead to a recall advantage for the emotional words. A second idea is that good recall of emotional words results from the distinctiveness of those words in a mixed-list design. This distinctiveness hypothesis predicts that the superior recall of emotional words reported in Experiment 2 would disappear in the between-list design employed in Experiment 3. Furthermore, if item distinctiveness has its impact at retrieval only, then the emotional Stroop effect and memory for emotional words should be independent. A third hypothesis is that the slow post-attention elaboration serves to distinguish one word from another in a list. As such, there will be no difference in the overall level of memory for emotional and neutral words, but memory for the emotional words will be related to post-item processing time as measured by the carry-over in the Stroop task.

Method

Participants. Experiment 3 was conducted with 100 participants. Participants were recruited from the psychology research pool and received extra credit in their classes to participate.

Materials. Taboo words were the same as those used in Experiment 1. Emotional and neutral words were the same as those used in Experiment 2. As a result, the three pure lists were matched in word length, and the emotional and neutral lists were matched in word frequency. Taboo words had a lower average word frequency than the emotional and neutral lists. Thirty-four participants saw the emotional list, 32 participants saw the neutral list, and 34 participants saw the taboo list.

Procedure. The procedure for Experiment 3 closely followed that of Experiment 1b. Participants began with practice trials consisting of four words. Each word was presented twice in each color for a total of 40 practice trials. The experimental trials contained 16 words, each presented twice in each color, for a total of 160 trials. One of the goals of this research was to reduce the ISI to enable us to measure carry-over from one stimulus word to the next. Toward this goal, two pretests were conducted, the first with a 16 msec, and the second with a 500 msec delay between the response and the presentation of the next stimulus. Unfortunately, participants

made an excessive number of errors in both of these pretests. We settled on a 1,000 msec interval that led to error rates similar to those observed in Experiments 1 and 2. During each Stroop trial, a word stimulus appeared in the center of a light gray screen until the participant responded by saying the color of the word. The screen then went blank for 1,000 msec, followed by the next word stimulus. After the participant had completed the experimental trials, he or she spent three minutes trying to recall the words in a surprise memory test.

Results and Discussion

A summary of the results of both experiments can be found in Table 1. The ink-naming times and the recall results are summarized in Table 3. In the analysis of the ink-naming times, there was a main effect of word type, with neutral words leading to the fastest response times ($M = 656$), followed by emotional words ($M = 686$), followed by taboo words ($M = 724$), $F(2, 94) = 4.51$, $MSE = 16903$. In addition, there was a main effect of block, with response times slowing between the first 80 trials ($M = 679$) and the last 80 trials ($M = 699$), $F(1, 94) = 21.42$, $MSE = 941.16$, and a block by word type interaction, $F(2, 94) = 5.20$, $MSE = 941.16$. Reaction times slowed over the course of the experiment to neutral and emotional words, but remained relatively constant for taboo words. Thus, as in Experiment 1, the taboo Stroop effect was larger during the first than during the second half of the experiment. Examining the effect of word type more closely, responses to taboo words were significantly slower than responses to both emotional words, $t(63) = 1.66$, $SEM = 22.83$, and neutral words, $t(64) = 2.99$, $SEM = 22.64$. Responses to emotional words were marginally slower than responses to neutral words, $t(61) = 1.29$, $SEM = 23.17$, $p \approx .10$. These results were modulated by the interaction with block. The difference between taboo and emotional words was significant only in block 1, $t(63) = 3.54$, whereas the difference between emotional and neutral words was significant only in block 2, $t(61) = 2.07$. These results support the conclusions that the taboo and emotional Stroop effects result from different processes. The taboo Stroop effect is relatively large in magnitude, and results from a fast attention response that habituates over trials. In contrast, the smaller emotional Stroop effect results from a slow carry-over effect that actually increases during the course of the experiment.

Table 3. Ink naming times and percent recall in Experiment 3 for taboo, emotional and neutral words. (preliminary results)

Word Type	Taboo	Emotional	Neutral
Naming Time (msec)	724	686	656
Recall	.54	.30	.31

Because the mean reaction time difference between the taboo and emotional words was both small and complicated by interactions with trial block, an additional item analysis was conducted. In this analysis, the reaction time data were collapsed across participants, and words served as random variables within the factor word type. As in the above analysis, there was a main effect of word type, $F(2, 47) = 143.43$, $MSE = 123.67$. Unlike the results reported above, all paired comparisons between word types were significant, with the smallest $t(15) = 7.36$, $MSE = 3.93$.

The results of the recall test proved equally interesting, with a significant effect of word type on the proportion of words recalled, $F(2, 97) = 36.16$, $MSE = .0175$. A larger proportion

of taboo words ($M = .54$) were recalled than emotional words ($M = .31$), $t(66) = 7.28$, $SEM = .032$, and neutral words ($M = .30$), $t(64) = 7.41$, $SEM = .033$. There was no difference in the recall of emotional and neutral words, $t(64) = .24$, $SEM = .033$. These results support the conclusions of Experiment 1 that the taboo memory effect is still robust in a between-subjects manipulation of word type. However, they also suggest that emotional (non-taboo) words are not better remembered than neutral words in between-subjects manipulations. Whereas it is hazardous to make statistical comparisons between experiments, one can estimate the power of Experiment 3 in detecting the magnitude of the emotional memory effect observed in Experiment 2. The .10 difference observed in Experiment 2 would yield a $p = .002$ given the SEM in Experiment 3.

The results of Experiment 3 serve to further support the argument that taboo and non-taboo emotional words are processed differently. Taboo words lead to a strong and fast attention response that habituates over trials, and taboo words are remembered better than neutral words even in a between-subjects design. In contrast, emotional (non-taboo) words lead to a slow shift in directed attention that is relatively small in magnitude, and increases across a series of experimental trials. Furthermore, emotional words are not better remembered than neutral words in a between-subjects manipulation of word type.

General Discussion

Three experiments are reported above that explore attention and memory for taboo, emotional (non-taboo), and neutral words. Experiment 1 compared memory for taboo words to memory for an easily organized list of neutral words in both a mixed-list and a between-list manipulation of word type. In both experimental designs, taboo words led to slower ink naming times and better memory than the neutral words. Because the taboo Stroop effect was observed in both designs, and with relatively long ISI's, we attribute this effect to a fast shift in attention to the semantic content of the taboo word, distracting participants from the ink naming task. Furthermore, because the memory effect was observed in both designs, it seems likely that good memory for taboo words resulted from this shift in attention rather than to item distinctiveness or retrieval processes that favor the taboo words.

Experiment 2 compared non-taboo emotional words to a matched list of neutral words in both mixed and block presentations. The ink naming results replicated the work of other researchers (e.g., McKenna and Sharma, 2004) in that no Stroop effect was found with the relatively long ISI we employed. However, the emotional words were better remembered than neutral words, and the magnitude of this effect was similar in block and random presentations. These results led us to reject an explanation of the memory data based on the idea that emotional words receive extra attention to the detriment of the neutral words in the same list. Rather, enhanced memory for the emotional words may result from elaborative processing occurring between items or to item distinctiveness (Dewhurst and Parry, 2000).

Experiment 3 provided a direct comparison between taboo, non-taboo emotional words, and neutral words in a between-list manipulation of word type. The taboo Stroop and the taboo memory effects observed in Experiment 1 were observed again in Experiment 3. In addition, owing to a relatively short ISI, an emotional Stroop effect was observed. However, there was no evidence that the emotional words were remembered better than the neutral words. The memory results thus replicate and extend those reported by Talmi and Moscovitch (2004). Using non-taboo emotional words, and a between-subjects design, they demonstrated that emotional words were not remembered any better than an easily organized list of neutral words. Had they used taboo words, or a mixed-list design, they may have reached a different conclusion.

Table 4. Experiment 3 mean reaction times for recalled and not recalled words (word n), and for words following (word n+1) recalled and not recalled words as a function of word type.

Word Type	Taboo	Emotional	Neutral
Word n			
Recalled words	732	688	665
Words not recalled	717	688	653
Word n+1			
Recalled words	728	695	656
Words not recalled	716	683	656

Taken together, the results reported above paint a picture of the relation between emotion, attention, and memory. Perhaps extremely threatening stimuli (such as taboo words) lead to a fast, automatic, shift in attention toward stimulus analysis and away from less significant tasks (e.g., ink naming). In addition, following stimulus presentation, people continue to dwell on these threatening stimuli, leading to carry-over from one stimulus to the next at relatively fast rates of presentation. The increase in stimulus analysis resulting from both the fast- and the slow-attention shifts may support good memory for these highly emotional stimuli. Less significant emotional stimuli do not lead to the fast automatic shift in attention. Rather, these stimuli lead to a slow shift in attention that may only disrupt processing of material presented very shortly after the emotional stimulus. The delayed attention to emotional stimuli may serve to distinguish the stimuli from other stimuli presented in the same context. Such distinctive processing supports good memory for these items. However, this memory effect can only be observed if experimenters can distinguish between items that do and do not receive these extended processes. As such, the memory effect can be detected in mixed-list designs in which emotional items are more likely to receive distinctive processing than neutral items (Experiment 2). The effect of extended processing can also be observed if the emotional items can be separated into those that do and do not receive the extended processing (Experiment 3). In this manner, the results support the idea that two factors contribute to good memory for emotional stimuli, a fast pre-attentive response to threatening stimuli and a slow discriminative processing of both threatening and non-threatening emotional stimuli.

A complete explanation of the results requires the separation of emotional words into different word types, a division of attention processes into fast and slow responses, and a complete theory of memory incorporating individual item (discriminative) and relational processing (Hunt and Einstein, 1981). The two-factor theory, based on Christainson's two-stage model, incorporates these ideas. According to this theory, threatening emotional stimuli lead to a fast shift in attention to the source of emotion, enhancing memory for these stimuli independent of experimental designed. Threatening stimuli also benefit from continued discriminative processing following stimulus presentation. Other emotional stimuli may also lead to discriminative processing in the absence of the fast shift in attention. However, good memory for these stimuli will only be observed in research designs sensitive to differences in item-distinctiveness, such as mixed-list designs.

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A Rose Is a Rose Is a Rose

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God gave us our memories so that we might have roses in December.

– J.M. Barrie

A rose essentially weaves the spell that begins the magic in the fairy tale of *Beauty and the Beast*. Although this story has been retold throughout the ages, the first written version was created in 1740 by Madame Gabrielle de Villeneuve. She wrote a novella length version which appeared in *La jeune américaine, et les contes marins*. The novella, a discourse on true love and class difference, was not written for children, but instead for her adult court and salon friends who enjoyed sharing stories for entertainment. In her study of the history of the tale, renowned critic Betsy Hearne comments that Villeneuve's "development of a complex explanation, 75 out of 187 pages, of the Beast's enchantment and Beauty's lineage complicates the number of characters and their relationships." Hearne finds de Villeneuve's plot to be mechanically ingenious because she accounts for everything so completely (Hearne 21, 23).

Sixteen years later, another French woman, Madame Le Prince de Beaumont, wrote the most often retold *Beauty and the Beast* version. She was a governess who considerably shortened de Villeneuve's novel into a short story in an educational book entitled, *Magasin des Enfants* in 1757 as a learning tool for young ladies. Madame de Beaumont took her story from de Villeneuve, but left out the long descriptions of Beauty's entertainments at the Beast's palace, the appearances in Beauty's dreams of the prince and the fairy, and the stories of Beauty's and the Beast's backgrounds. In the opinion of some critics, as related in *When Dreams Come True*, a drawback of de Beaumont's shorter version is that conventionalizing the fairy tale for educational purposes led to the undermining of the utopian qualities of the earlier tale by de Villeneuve by preaching domesticity and self-sacrifice for women (Zipes 47). Yet, in defense of her version, de Beaumont's tale led to a more general acceptance of the literary fairy tale as a genre for all ages and classes of readers. According to Anna Altmann and Gail De Vos in the book *Tales, Then and Now*, "in the eighteenth century, *Beauty and the Beast* was about romantic, courtly love" (1989). In the classic pattern of courtship, the Beast serves Beauty as best he can, but Beauty continues to refuse him despite his efforts. The Beast suffers to the point of death for his lady until, finally, realizing her love for him, Beauty says "yes." In the tradition of courtly love, Beauty always has a choice, and the insistence of the eighteenth-century writers on this choice was revolutionary, a protest against daughters being given away in marriage to husbands of their father's choosing.

Many contemporary versions of the tale seem to incorporate the magic and ideals of the de Villeneuve account and the conciseness of de Beaumont's story. Most twentieth-century versions of *Beauty and the Beast* contain some constants, such as the characters of Beauty, the father and the Beast. Key elements may vary slightly, such as in the number of siblings, or remain close to the traditional eighteenth-century versions, such as the family's misfortunes and moves they make, seasonal changes, the rose motif, and the Beast's magic garden.

In her book *From the Beast to the Blonde*, Marina Warner theorizes that the story of *Beauty and the Beast* was created to comfort daughters who faced arranged marriages and leaving their homes to live in the unknown household. While the daughter is reluctant to leave, she

is ultimately rewarded with a happy marriage because she honors her parents and the initial sacrifice of her own desires to follow their demand (277). *Beauty and the Beast* emerged in written form during a time in society when the tale became a device for instilling hope and romance into the otherwise terrifying prospect of young girls being bargained off to family-arranged and loveless marriages. The Beast symbolizes the repugnant stranger to whom the young bride must submit herself. It is only by sheer virtue of her selfless character and courageous qualities that she converts the dreadful creature into a handsome and romantic prince.

Although arranged marriages are not demanded in today's Western society, young women are still leaving the familiarity of their own home to take on a life with a young man who may have totally different values and beliefs. This requires adjustments on the part of both partners and at times the young woman may feel she is indeed in the home of a beast or monster. The same, however, may be said for the male counterpart. The question may come up on both sides, "Who is the beauty or who is the beast?"

A well-known version of *Beauty and the Beast* comes from Andrew Lang's *Blue Fairy Book* from 1889. Lang attributes his version to de Villeneuve, but it is actually an interesting mesh of de Villeneuve and de Beaumont which gives enough details to make the characters appealing and come alive but not so much as to bog them down in rhetoric (Heiner). Lang incorporated de Villeneuve's prince and fairy dreams in his version along with some of the Beast's gifts and entertainments. He describes Beauty's brothers as kind and loving; Beauty's sisters are only looking for good times and laugh at their youngest sister for spending so much time reading books (Altmann). The summarized version of the tale discussed below is from Lang's version.

The tale begins with a description of a rich merchant who has six lovely daughters and six sons. The youngest, Beauty, is the most beautiful of all, loving, and kind. The merchant loses his wealth when his home burns to the ground and his ships are lost at sea. The family moves to the country and lives in abject poverty; the entire family must work hard to survive. After some time the merchant hears that one of his ships has returned safely and, having first asked his daughters what he should bring back for them, he makes a journey to settle his affairs. The older sisters want dresses and jewels, but Beauty asks only for her father's safety and a rose. However, the father finds out that his goods were sold off by the shipping clerks and that he is not much better off financially than before. He starts back home in despair. The weather has turned bad and he gets lost in a snow storm. He finds shelter for the night in a mysterious, magical palace. As the merchant leaves the next morning he picks a rose from the garden for his youngest daughter, Beauty. Suddenly a horrible Beast appears and tells the merchant that either he must pay for the theft of the rose with his own life or send the Beast one of his daughters. The merchant returns home with the rose and his story, so Beauty insists that she be the one to go back to the Beast's palace in her father's stead. At the Beast's palace, she is surrounded by every comfort and in time loses her fear of him. She dreams of a handsome prince, and a fairy visits her in dreams as well. She even begins to enjoy the company of the Beast. But she misses and worries about her father, and when she discovers that he is gravely ill, the Beast gives her permission to go home, on the condition that she return within a set time. Her sisters persuade her to stay longer than she should, and when she finally returns to the palace she finds the Beast dying from grief for her. She discovers that she loves him, and tells him so, thus breaking the enchantment that made him a beast. He turns into a handsome prince, and the two marry and live happily ever after.

Despite changing some elements such as the number of siblings or the father's profession, other versions continue to maintain some of the basic key elements of the family's misfortunes and their moves, seasonal changes, the rose and the magic garden at the Beast's palace. Authors

continue to tell the story of *Beauty and the Beast*. In fact, it remains one of the most well-loved and most read stories of all time.

In de Villeneuve's version there are six sons and six daughters. The number of siblings varies in every version of the tale. In de Beaumont's version, there are only three sons and three daughters. De Beaumont cut the number in half, giving Beauty three brothers and two sisters, and other authors leave out the brothers and just give Beauty two older sisters. The sisters are usually antagonistic to their younger sister and are portrayed as petulant and complaining.

The role of Beauty as the youngest daughter and most favored by the father is important in the pecking order among family members. Since last-born children are rarely the strongest or most capable during childhood, they often carve out a place for themselves by being clever and charming, and many youngest children develop impressive social skills. Within the family, they often become skilled politicians, learning to get through negotiation what they can not win by force. They may become the resident peacekeepers. Some youngest children, however, refuse to accept the helpless label. Instead, years of sticking up for themselves against the might of their older siblings prepare these children for careers as successful advocates, often championing the cause of the underdog (Needlman). Beauty has learned some of these skills as she keeps her father happy, deals with the sisters, and learns to negotiate peace with the Beast.

The misfortunes that befall the family indicate that bad things can happen to people and are not necessarily of their own making, and consequently no blame can be attached. Hardships may alter one's lifestyle and the way people handle problems; in most cases growth occurs because of the way the individual deals with adversity. The merchant's family must deal with financial hardships and learn to cope. The Beast also has to cope with his own suffering that he, too, has no control over.

Beauty's move from the city to the country and finally to the hidden enchanted palace of the Beast deep in the forest is a basic element in the story; in fact, the various journeys are the frame for the overall plot. Hearne indicates that critics also interpret the physical journeys as metaphors for Beauty's inner journey (126). Beauty begins her journey as a young adult just beginning to understand her own desires when she is thrust into being a part of the Beast's household. She does not understand the Beast's desires and her own womanly desires have not yet come to fruition. It is only with the passage of time and the patience of the Beast that she comes to appreciate his kindness, generosity and goodness, and then she begins to deal with the feelings of her heart and passion. The Beast also changes during the course of the story from a vicious being to a generous and caring individual waiting patiently for the maturity of the woman he loves.

Another core element is the changes in the seasons that are important to the story. They indicate not only the passage of time but symbolically indicate various states of being. When the father is in the snow storm, it is winter and the snow symbolizes defeat or death. The father can go no farther when he stumbles upon the beast's castle. It is warm, the orange trees are bearing fruit, and the garden and grass are lush with blooming flowers. Hearne suggests that these descriptions indicate summertime, and symbolically the season of courtship. The same gardens that are full and lush begin to turn brown and fallow when Beauty fails to return and the Beast is dying (125). The seasonal changes are present in every *Beauty and the Beast* tale to parallel life and death for each character. The father understands his defeat and realizes he is growing older as the seasons change. The Beast is alive and virile during his courtship of Beauty but when she leaves he becomes morose and no longer wishes to live because he fears that she will not return. For Beauty, the seasons change as she grows older and wiser. She begins to

understand her affection and love for the Beast as spring comes while she is at home nursing her ailing father and she returns to the Beast in his winter as he lies dying.

The rose is the catalyst that drives the story to its final conclusion. Beauty wants a rose thinking it will not be too costly for her father. In fact, it may cost him his life. It changes her life forever as she sacrifices herself to the Beast in return for her father's life. In classical and Christian traditions, the rose is a symbol of life and the suffering born of love. According to Stephen Olderr in *Symbolism: A Comprehensive Dictionary*, roses symbolize love, completion, perfection, beauty, female sex organs, and the heart. A rose is also the sign of youth, beauty and innocence (113). Beauty comes in innocence to the Beast's palace. She, like the rose, is beautiful, perfect and untouched. Waiting for love while living with the Beast, she is unsure if she will ever experience love in its fullness even though at first she is not even aware of what love is. The dreams of the prince fill her with longing, but her life with the Beast is what is real for her. The dreams are only a nighttime experience. The Beast is a huge masculine creature with the characteristics of the beast, claws that scratch, teeth that bite and tear similar to the thorns of a rose. The Beast, however, must be patient and learn to wait for Beauty to see that he is lovable and worth her love. The realization that the Beast must do this in order to see if his love will react and save him keeps the audience in suspense. In many of the versions, the rose represents completion of their union once love is recognized and fulfilled. Descriptions and illustrations show roses in full bloom surrounding the palace and gardens once Beauty responds to the Beast.

Magic is subtle in *Beauty and the Beast* and yet it is everywhere: The magic garden at the Beast's palace, magic fireworks as Beauty comes onto the grounds and at the end when she finally accepts the Beast's proposal. There is also a magic ring to transport her from the castle to her father's house and back again. There is magic in the appearance of food on the table, flowers in the garden, and a magic mirror that reflects any images Beauty wants to see. And yet, as Hearne states, magic will not solve the central problem. Only human love upon which the final transformation is conditional can solve both Beauty's desire and the Beast's fate (127).

Today's distinct voice in the retelling of *Beauty and the Beast* is Disney Studios' animated film, which was introduced to an appreciative audience in 1991 and has left an indelible impression. Children's literature critic Jerry Griswold remarks in his book that it was the first animated film ever to have received a nomination for an Academy Award as Best Picture of the Year (238). Although loved by viewers of all ages, it differs in a number of ways from the traditional tale. Critics praised the film for breaking the sexist mold of its fairy tale heroines by not making Belle a "passive character" and by giving her strength and self-determination but, as June Cummins points out in an article titled, "Romancing the Plot: The Real Beast of Disney's *Beauty and the Beast*," this characterization is tempered by the fact that all Belle wants, despite her "modern woman" descriptions, is to read fairy tales about falling in love, and as a character, she is really not much advanced past the traditional Disney heroines, after all (23). Belle is portrayed as a "bookworm" in the film, which the film's screenwriter, Linda Woolverton, claims excited her because heroines were not seen in that role before. The filmmakers decided to have Belle reading fairy tales as her books of choice, a decision much derided by feminist critics of the film. Hearne explains that in de Beaumont's account, Beauty "read all sorts of books, history, politics, philosophy, and religion" (17). Belle is given a library and is shown reading with the Beast, not necessarily for any reason other than to develop their relationship.

One of the differences that seem to make the Disney story weaker than the traditional one is the lack of conflict in the family since Belle (Beauty) is an only child and virtually a mother figure to her father who is a child-like, absent-minded inventor who cannot take care of himself.

Children love the animated tale because of this silly father; however, the role of Beauty as a nurturing mother figure leaves little chance for her to grow. She is also the mother figure to the Beast, who is like a bad-tempered child that needs to learn manners. There is still a love story because eventually she admits her love for him and he becomes her prince, and yet we are not shown a consuming passionate love story. According to Cummins, children are not seeing a well-balanced view of a relationship between men and women and of their own identities as individuals if the attention in the film is focused on courtship and the obvious outcome being marriage (23).

Another inconsistency with the traditional tale is that in the film the rose does not represent Beauty. The Disney version has the rose representing the Beast. It is being used as a timer set up by the sorceress who has enchanted him; when the rose dies his time to find true love is up. The rose is not the catalyst that brings them together, nor does it represent love between them. It is just a reminder of his mortality. Yet another, far more significant change, is in how Beauty comes to live at the Beast's castle. Beauty finds the castle because she is searching for her missing father. He is the Beast's prisoner and she offers herself in place of the father. Cummins observes that Woolverton, along with producer Don Hahn, felt that it is not really Belle's love story as much as it is the Beast's. They felt that it was the Beast with the problem and therefore more his story (Cummins 24).

Gaston, an additional character, causes a love triangle in the film that does not exist in the traditional text. This adds a dimension to the film: a foil to the beast and another suitor for Belle. Gaston has funny as well as sinister moments in the film, but the real problem with the inclusion of Gaston is that the threat to the Beast's life is not for want of Belle, but because Gaston tries to kill him by inciting an angry mob. Cummins' reaction to Gaston's presence is that "he reinforces a violent, angry element, also seen in the Beast that is objectionable. Gaston's brutal and often sadistic actions are provoked by desire for a woman which invidiously links sex and violence in a culture that far too often suffers the ramification of that union" (27). In one scene, Gaston hovers over Belle to propose to her, flexing muscles as he pins her against the wall and throws a chair across the room. He even threatens her with bodily harm if she refuses to marry him. Some critics argue that Gaston takes the place of the sisters because of his ignorance and superficial manners, but he does not add to the family dynamics and so is unable to take advantage of this particular aspect of the tale.

Cummins comments that the film updates the fairy tale for contemporary society and remarks that Belle is an improvement on earlier Disney heroines because she is presented as a person with interests, goals and aspirations and is shown to have courage, curiosity and a somewhat rebellious nature. However, these traits are not rewarded or acknowledged as the film closes (27). The prominent traits that personify Belle become her nurturing tenderness, beauty, and her commitment to be married to the Beast. All of those uplifting traits that were so important in the beginning of the film have been lessened or purged entirely. Belle does not grow, she never has the chance to travel, reading is not mentioned again, and we have no way of knowing whether she will continue to develop into her own person. Cummins makes an alarming observation: That because the film "snared" us into thinking it would transcend earlier Disney fairy tales but does not, it is ultimately more dangerous than the most blatantly sexist fairy tales (27).

Authors have presented *Beauty and the Beast* as novels, illustrated children's books and short stories to delight adults, young adults and children. One of the best is *Beauty: A Retelling of the Story of Beauty and the Beast* by Robin McKinley. It is the first version published specifically for young adults since de Beaumont's foundational story. The story features Beauty, whose real

name is Honor, though she has been called Beauty since she was five. She does not think she is as beautiful as her sisters. Her two older sisters are called Hope and Grace. Beauty is only 16, thin, awkward and undersized with big hands and feet. Since the story was written for young adults, a teen will easily identify with the heroine and all of her insecurities. The merchant father has fallen on hard times and the family moves to a cottage in a forest far away from their city home. All three of the sisters love each other and work together to make a good home for their ailing father. When the father leaves for town to find out about his ships, Beauty desires a rose to plant around the cottage.

This is the story of Beauty, but it is also the story of the Beast. He has been in this enchanted state for 200 years and is no longer tormented by it, but accepts his situation. When Beauty goes to the castle, she expects that the Beast will devour her. When she realizes that her fear is unfounded, she does not understand the purpose of her presence there. It is only when she realizes her love for the Beast that she begins to realize she has matured into a lovely woman. McKinley's story incorporates the use of magic, the symbolic roses and a good love story.

McKinley wrote a second version of the tale, *Rose Daughter*, 20 years later to tell the story from a different perspective and with an added twist. There is more magic in this book than in *Beauty*. The main theme throughout the story is the rose. Sorcerers and green witches are a common part of daily life. The Beast himself was a sorcerer/philosopher before he was transformed. He was turned into a Beast not by a curse, but by accident, because he came too close to the secrets of the universe that must remain beyond human understanding. He condemned himself to solitude and gave up philosophy. Beauty is a gardener, and when the family moves to the country she discovers she can grow roses, which are considered to be the flowers of love that usually only grow for a sorcerer. However, they grow for her at a cottage that was mysteriously left to Beauty and her two sisters by an unknown old woman. She considers the roses her friends (77). The Beast is given Beauty to tend to his roses when her father steals a rose from the Beast because the roses in his garden are dying. Beauty tries to help make the garden grow again. There is an interesting twist in the end where Beauty is given a choice of having the Beast turn into a prince with great wealth or remain the Beast and live in the cottage among friends and family. This tale is another beautiful rendition of an old tale.

A tale told from the point of view of the Beast is Donna Jo Napoli's book aptly titled, *Beast*. She sets the story in Persia, and the young prince tells the story from his point of view as narrator of how he became a lion through his own negligence and a dead camel's soul. Using the setting of Persia gives a certain mysterious quality to the story. The young prince is not a bad person, just spoiled because of his status in the world. He is used to having his own way. Once he changes into a lion, he becomes a hunted animal. He seeks shelter in various countries only to finally find an abandoned palace in France. The story follows the lion through several years as he tries to undo his spell, then a father plucks a rose from the garden for his daughter. Napoli's depiction of the Beast is different in that the lion doesn't wear clothes, and is unable to speak, yet he can read, scratch messages in the dirt and is able to plant gardens by pawing the dirt, carrying seeds in a bag by his mouth. The audience is given a glimpse through the eyes of the beast, that even though he thinks like a man, he has the appetites of a beast.

Chris Anne Wolfe weaves a tale for adult readers in her novel *The Rose and the Thorn*. In this version the "monster" won't let the young woman see her (not "him"). Throughout the tale the audience is unaware of the "monster's" gender. In time, we find that the monster is actually a beautiful woman, who has been cursed by a wicked stepmother to live alone until a beautiful young woman can love her. Even the monster's father (who loved her dearly until she was found with a young girl when she was a teen) has deserted her, thinking her to be a "monster."

In this version, Beauty's abusive, merchant stepfather gets lost in a storm and comes upon a magical castle. The owner is looking for a wife. Since the merchant is down on his luck, the owner offers to give the merchant great riches every two months for the rest of his life if he sends his daughter to the castle. He must tell Beauty the deal and she must agree in order for the arrangement to be accepted. Another main difference between Wolfe's novel and the traditional story is that the mother is alive, although sickly, and she is the major cause of concern for Beauty because of her health. Beauty also has two nasty older brothers and no sisters. This is a lesbian retelling of the version which has some passion, yet is told with dignity and respect. There is some stereotypical bashing of the male characters, however. The stepfather is abusive, as are the two brothers. The father of the Beast is also portrayed as uncaring when finding his daughter is "different." Only the women and the creatures that live around the palace have any redeeming qualities.

There are several beautifully illustrated picture-book versions of this tale. One of these is by Jan Brett. She uses a Dutch setting and makes the Beast a wild boar. She also uses tapestries in the backgrounds with mottos on them to capture the feeling of Sir Arthur Quiller-Couch's version of the tale where messages appear over doorways and in dreams. The tapestries show the truth in a picture where all is not what it seems. This is a beautifully illustrated book that engages its reader with the intricate illustrations and traditional text using the fairies and enchanted staff of the castles plus the well-known main characters.

Another highly respected author, Marianne Mayer, and illustrator Mercer Mayer, created a beautiful version that is both elaborate and stunning. The illustrator uses deep rich tones of brown and gold with a medieval type of setting. Once the rose is introduced into the story, roses appear everywhere. Red ones represent Beauty and white ones represent the Beast, and eventually pink roses enter the picture to show their union. The story is a retelling of a modified de Villeneuve's version with multiple dream sequences. Jerry Griswold points out in *Beauty and the Beast, A Handbook* that Mayer borrowed from Disney Studios – both the Beast's uncontrollable anger and by having the prince changed into the Beast by an "old hag" (157). This allows Mayer to explain the Beast's "beastliness" and foreshadow the conclusion. The mirror reflects a sad and dying Beast when Beauty looks into it from her father's home. She immediately flees to the castle to save him. Once he turns into a prince, it is remarkable how much Beauty and the Beast resemble each other in Mayer's illustration of the scene. Griswold comments that the story is about looking and seeing themselves in each other (160).

Another author, Nancy Willard, wrote an unusual version of *Beauty and the Beast*, illustrated by Barry Moser. The story is set in the early part of the century in New York on Fifth Avenue, a very different setting from previous retellings. The mother dabbled in magic; she is dead and mourned by her husband and youngest daughter. The illustrations are done in black wood engravings on vanilla paper to give them an old world look. The Beast is not depicted as any particular type of animal but has a peculiar deformed human look to him. In other tales, he is depicted as part animal and part human or totally animal in human clothes. There is enchantment, magic and witchcraft in this tale as in other versions. The Beast always refers to himself as stupid and Beauty reassures him, telling him he can learn. She sees her mother in her dreams saying, "I'm proud of you, my girl. Nothing is as it seems, is it? You take after me" (44). Herbs and flowers abound at the mansion. This is a very intricate part of the story, and Willard goes into considerable detail about the curative powers of herbs and the meanings of various flowers and plants. The Beast cures Beauty's hand when she cuts it on some thorns. As in other tales, Beauty begins to care for the Beast, but when she returns home to her ailing father, her

sisters trick her into staying longer. She dreams that her Beast is dying and returns to him just in time to save him.

There is magic in a fairy tale, whether told by the fireside, read from a beautifully illustrated version, or written down in a novel. The story of *Beauty and the Beast* will live forever as long as storytellers and illustrators can put pen to paper. This story holds a mirror up to our own faces and lets us see what we want to see. A beautiful girl, a beast or a prince – what is beauty and what is a beast? It is a question that haunts us every day as we see something or someone different from what we expect. There is much to learn from this tale because there are “beasts” lurking in many different parts of our lives. It is important to remember that sometimes we have to look beneath the surface and find the beauty hidden there.

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