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Fall 2000
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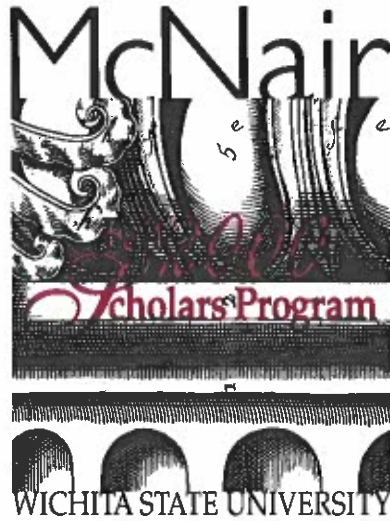
**Journal
of Research
Reports**

*"True courage
comes in
enduring . . .
persevering
and believing
in oneself."*

-Ronald McNair

WICHITA STATE UNIVERSITY





**Journal
of Research
Reports**

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E d i t o r s

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The *Journal of Research Reports* is produced and published annually by the Wichita State University McNair Scholars Program to further the objectives of the program. The goal of the McNair Scholars Program is to provide quality services which encourage students who are underrepresented in higher education to graduate with bachelor's degrees from WSU and to pursue post-baccalaureate degrees.

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D i r e c t o r

*W*ith great pride and honor, I present this journal to all of our friends and associates. The students whose works appear in this journal are to be commended for their long and hard efforts over the course of the 1999-2000 academic year. Hopefully this publication will serve to inspire other students to engage more ardently in undergraduate research.

A special word of thanks goes out to each of the faculty members who took the time to mentor and teach the McNair scholars about research and its applications. Their commitment to the students, the program, and the University is greatly appreciated. I would also like to congratulate my capable staff for their missionary work in producing such a quality document. In particular, I commend Jan Petersen and Sally Ewy for undertaking this project. The time and care they gave in making this journal a reality benefits the entire TRIO community and is indicative of the passion that TRIO personnel have for its students.

Finally, accolades are in order for the McNair professional staff. Since 1995, LaWanda Holt-Fields and Linda Lindsly have teamed with me in developing a program that is both meaningful and practical for the students. Their experience and vision ensure that the WSU McNair Scholars Program is one of the best programs in the nation.

Larry A. Ramos
Director

R e s e a r c h A s s i s t a n t

*C*ongratulations to the McNair Scholars of 2000 for a job well done! Persevering through busy schedules and arduous life demands, students dedicated themselves to completing their research and meeting McNair deadlines and responsibilities. The McNair Scholars actively pursued their research interests and the investigative process. Guided by their faculty mentors, students gained greater knowledge regarding research and writing. This experience will serve the students well as they prepare for graduate school. I commend these students and encourage them to follow their dreams, pursue scholarship, and continue to contribute to society.

Carry on, Scholars!

Jan Petersen
Research Assistant



A Study of the Nature of Charge Transport in Polypyrrole Using Electron Paramagnetic Resonance

Yina Felosky, *WSU McNair Scholar*

Pawan K. Kahol, *PhD, Physics, Wichita State University*

Abstract

Polypyrrole, a polymer that exhibits conductivity characteristics, is synthesized by polymerization of pyrrole monomers under certain conditions. Over the past twenty years, researchers tried to understand and explain the conducting behavior of polypyrrole. Recently, improved synthesis of polypyrrole films led to increased conductivity and better electronic behavior. Research indicates, via four-probe measurements, that relative to "vacuum," conductivity in an atmosphere of oxygen increases while conductivity in the presence of water vapor decreases. Since electron spin resonance (ESR) technique provides a fingerprint of local microscopic interactions and constructs a physical model for explaining the conductivity changes due to oxygen and water atmospheres, we investigated the fluctuations and trends in conductivity by charting the changes in ESR A/B ratio and line-width. In this study, the spectra of polypyrrole showed asymmetry; and, since oxygen is paramagnetic, it interacted with the spins while showing a decrease in the line-width.

A Study of the Nature of Charge Transport in Polypyrrole Using Electron Paramagnetic Resonance

Polypyrrole is a polymer that exhibits conductivity characteristics. It is synthesized by polymerization of pyrrole monomers under certain conditions.

For the past twenty years, experiments have been conducted on these types of materials to grasp an understanding and explanation of the conducting behavior of polypyrrole. Recent improved synthesis of polypyrrole films has led to increased conductivity and better electronic behavior. Kaiser (1999) demonstrated that

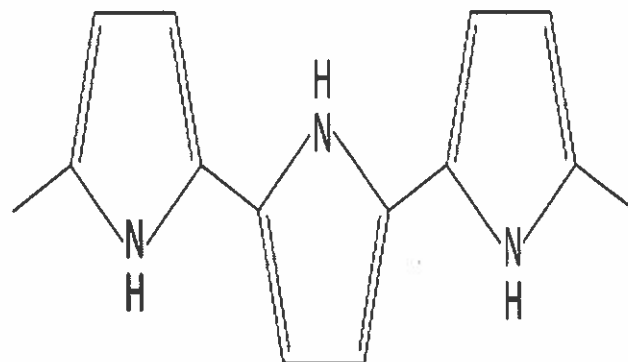


Figure 1. Polypyrrole structure

polypyrrole films increase their conductivity when exposed to an oxygen atmosphere. When he measured the resistance of films with a thickness of about 5 to 10 microns in oxygen, the resistance decreased by about 40%. In contrast, the resistance increased when the sample was exposed to moisture. The EPR technique is used in this research to investigate and obtain a deeper understanding of interactions, which create these conductivity changes. Due to their conductive behavior, these films have a great potential to be utilized by different industries such as aerospace, bio-medical, and wineries, and for the development and marketing of sensors.

Materials and Methods

We have measured the asymmetry ratio A/B of the electron spin resonance spectra of a polypyrrole sample that had been previously cut into small pieces to increase the surface area. The sample was first pumped under vacuum and then exposed to oxygen. The asymmetry ratio is proportional to conductivity. That is, if the ratio A/B increases, the conductivity will increase as well. We took the values of the asymmetry ratio and compared them to the values of the following graph (Kahol, 1992) to obtain the value of d/δ , d = skin depth and δ = film thickness (0.012 cm).

The skin depth is inversely proportional to the conductivity as denoted by the following formula:

$$\sigma = \frac{c^2}{2\pi^2\mu\nu\delta^2}$$

Defined by c = speed of light (3×10^{10} cm/sec), μ = microwave frequency (1), ν = frequency (9.6 gz), σ = conductivity. We also obtained the skin depth value from the above formula based on the following equation:

$$\delta = \frac{c}{2\pi\sqrt{\sigma\mu\nu}}$$

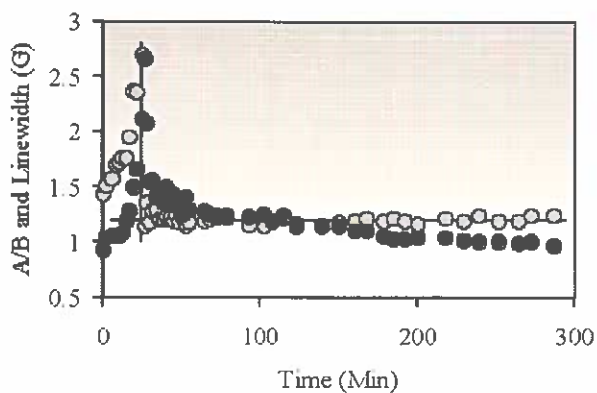


Figure 1. A/B and electron paramagnetic resonance linewidth function of time. Oxygen at a pressure of 1000 torr was introduced into sample for 24 minutes (indicated by vertical lines), for 140 minutes, followed by pumping under vacuum.

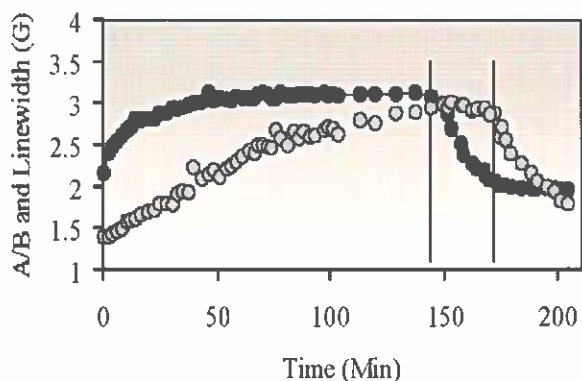


Figure 2. A/B and electron paramagnetic linewidth of polypyrrole treated with ammonia as a function of time. Oxygen at a pressure of 520 torr was introduced into sample followed by pumping under vacuum.

Note that the conductivity of the polypyrrole sample (Figure 1) is large compared to the conductivity of the polypyrrole treated with ammonia (Figure 2) when exposed to oxygen. The spectra of polypyrrole showed an asymmetry. At time zero, the sample was pumped and then exposed to oxygen. As oxygen entered the sample, the A/B asymmetry ratio increased. Figure 1 shows that after the sample was exposed to an oxygen atmosphere, the asymmetry ratio of A/B increased from 1.4 to 2.6. After the sample was pumped, the asymmetry ratio instantly dropped from 2.6 to 1.5 and remained constant thereafter. On the other hand, the linewidth, which decreased slowly after being pumped, did not become constant as occurred with the asymmetry ratio. However, the sample treated with ammonia (Figure 2) when oxygen was introduced caused the asymmetry ratio to increase and become constant. The asymmetry ratio started decreasing when pumped,

but the linewidth became constant and remained constant while A/B decreased. After this time, (shown by the vertical lines) A/B reached a constant value and the linewidth started to drop.

Discussion

In this study, the spectra of polypyrrole showed asymmetry; and, since oxygen is paramagnetic, it interacted with the spins while showing a decrease in the linewidth. If we assume that the polypyrrole has a structure similar to spaghetti, it is easier to understand the problem of an increase in conductivity due to oxygen exposure. The polymer's structure is composed of different regions: compact metallic islands surrounded by disordered regions. Oxygen diffuses into the disordered regions before it reaches the metallic regions. The linewidth increases due to the interaction of oxygen paramagnetic molecules with the spins; A/B also increases. Oxygen in disordered regions is found freely around these chains. It explains why oxygen comes out faster when the sample is pumped than in the compact regions where it takes about 5 to 10 minutes. In addition, when the polypyrrole rings are affected by oxygen, the electron wave function becomes more delocalized; there is more contribution to the density of states at the electronic level; and A/B has more electron delocalization due to dipole interactions.

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The Effect of Animation on Recall of Text Presented on a Web Site

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A b s t r a c t

This study examines the influence of animation on recall of information presented on a given web site. Sites differing in contextual manipulations of animation, static graphics, and text (only), provide a medium for examining participants' total percent of recall across conditions of text and graphics combinations. In addition to recall as a function of the text and graphics conditions, this study examines the influences of gender, prior experience, age, and satisfaction of the participant with the site. On the basis of the hypothesis that animation interferes with participants' recall of text information, recall scores in the condition of animated graphics are expected to be less than recall scores in the still graphics condition. However, no significant interference is documented in any condition. Furthermore, the expectation that a text-only condition produces recall scores that are higher than both the animation and the static graphic conditions is not statistically upheld.

The Effect of Animation on Recall of Text Presented on a Web Site

This study examines the influence of animation on recall of information presented on a web site. The usage of animation has not been widely studied; however, advertising elements such as banner displays and motion graphics become more prolific as new web sites continue to saturate the World Wide Web (WWW). The emerging trend is the use of large, flashing, or otherwise distracting forms of animation (Benway & Lane, 1998). Consequently, research interest is turning to the development of guidelines and more questioning as to the proper format for web sites.

Considerable factors for web design include the manner in which humans process information presented at the site, emphasizing location as it relates data prioritization and users' reactions to

stimuli from the site. Recent studies on human factors for web design suggest that targeting the user's perspective is vital (Borges et al., 1996; Head, 1997). Massive displays defeat the purpose of information, particularly when the user's mode of perception is not adequately a definitive factor in web design (Billard, 1997).

Research shows that people browsing the web generally have a specific purpose. Consequently, banners advertising less than relevant information are ignored (Benway & Lane, 1999). Unfortunately, web users may inadvertently bypass sought information due to its stereotyped representation—in the form of a banner; this phenomena is documented and termed, "banner blindness" (Benway & Lane, 1999). The question of whether or not graphical displays are effective, or mere distractions, becomes a necessary focus.

While web animations are typically attention-g geared tactics, their proposed efficiency is expectedly limited under certain conditions. Web tactics such as animation, where successful, attract users to a given point on the site. Facilitating the web interface may enlist limitations to integrated graphics which can defer users from their purpose(s). For purposes of this study, sites differing in graphic manipulations provide a medium for examining participants' recall of a given web site.

In addition to recall as a function of text and graphics conditions, this study examines the influences of gender, prior web experience, age, and satisfaction of the participant with the site. Based on the hypothesis that animation interferes with participants' recall of text information, recall scores in the condition of animated graphics are expected to be less than recall scores in the still graphics condition. However, no significant interference is documented in any condition. Furthermore, the expectation that a text-only condition produces recall scores that are higher than both the animation and the static graphic conditions, is not statistically upheld.

M e t h o d

Participants

Potential participants were identified via contacts of the experimenters and psychology students at Wichita State University. Seventeen males and twenty-one females received credit in their psychology course for voluntary participation in this study. There were seven participants in the 18-24 age group (mean age = 20) and 13 participants in the 25-50 age group (mean age = 35). The mean age for males and females was 26.5 and 26.8, respectively. Participants varied in prior experience with computers and familiarity with navigating web sites. Participants ranged from college freshmen to graduate students. Per random assignment, 13 of the 38 participants experienced condition one—

animated graphics and text. Condition two—static graphics and text—had 12 participants. Fourteen participants received the third condition—text only.

Materials

A consent form required the signatures of both the participant and the experimenter. A one-computer “lab” contained two small desks and one small table with a hutch element. A pre-test consisted of the fill-in-the-blank and Likert-type questions about demographics and prior web experience. The experimental web site was created using Microsoft Front Page® software. Five “task cards,” each containing one task per card, were used across conditions.

A recall grid consisted of 15 2”x2” squares arranged in three columns. A satisfaction questionnaire containing seven statements, each with a Likert-type scale of 1 to 5, with five being “Agree.” An experimenter data collection sheet was used.

Procedure

Prior to experimentation, a sheet of paper was numbered one to 40. These numbers represented subject numbers, or the numbers assigned to successive experimental participants. For each subject number, the numbers one through five were randomly ordered. This random order represented the order in which task cards would be administered to participants. Each task card was assigned one number (1-5), prior to randomization. In the same manner, the numbers one through three were randomly ordered for each of 40 subject numbers. Thus the experimental conditions and the order of tasks to be performed were determined independent of actual participants.

Prospective participants were contacted by an experimenter who gave minimal other information about the study. The experimenter answered questions, which would not compromise results, after the participant made and kept an appointment at the lab. Prior to a participant’s arrival at the lab, the experimenter collected the necessary forms of consent, recall, data sheets, and task cards.

The site was manipulated to form three conditions of which each participant received only one. Although graphical representations were varied, textual contents were held constant across conditions. Participants in condition one received the text and animated graphics condition. Condition two contained text and static graphics. The third condition was a text only representation of the site. Textual locations were consistent across conditions. ErgoBrowser® was used to record time lapsed for each trial and correct/incorrect responses on individual tasks for each participant, at each site condition, respectively. To avoid prior test condition exposure, screens were kept in minimized (not visible)

states until the experimenter was ready to familiarize the participant with the site.

The computer lab was structured for only one participant at a time. Upon entering the lab, a participant was asked to read the consent form carefully, sign and date the consent form, and complete a background questionnaire. The experimenter then explained that the study was intended to gain insight into how web sites should be designed, and that the participant would be introduced to a web site on the lab computer. Each participant received only one condition. Before each trial, the experimenter initiated the site appropriate to the subject number and corresponding to the pre-randomized order.

After completing necessary forms, the participant was informed of the task card-question element, whose correct responses could be found on the web site. The site was maximized. The participant was familiarized with how to navigate the “back” function, in the case of an incorrect response, which would lead him or her to an unnecessary, other site. The participant was instructed to become familiar with the site, scrolling as necessary to view its entirety, for a maximum of five minutes.

The participant was instructed to read a task card carefully before beginning a task. The experimenter placed the first task card between the monitor and the keyboard in an upright position. The participant began when ready. This process was repeated until the fifth task had been completed. While the participant attempted the tasks, the experimenter recorded necessary information on the experimenter data sheet, and intermittently clicked the “end task” link after each task. When the last task was completed, the experimenter ended the task, and closed both the ErgoBrowser® and the site windows, preventing further reference to the site condition.

The participant was asked to leave the computer desk and be seated at either the table or desk which did not have the computer. The experimenter explained the recall grid in that its squares’ locations corresponded to the groupings of data presented at the web site the participant had just seen. Using the grid, the participant was asked to record any information recalled about the site whether it was graphics, text, or mere concepts. The participant was casually asked to notify the experimenter upon completion of the grid. The experimenter instructed the participant to begin recalling.

The experimenter was seated at the desk with the computer but never left the lab at any time when a participant was in the lab. When the participant indicated completion of the grid, the

experimenter presented the "Satisfaction Questionnaire." The participant was asked to complete the questionnaire and return it to the experimenter. Using the participant's responses on the questionnaire as a conversation guide, the experimenter sought more specific responses to the experiment. Any comments were recorded in the "User Comments."

When the comments dialogue was completed, the experimenter asked the participant not to discuss experimental content with others as this may compromise the validity of the study. The experimenter filled out an "extra credit" slip for the participant to be given to his or her psychology instructor. When the participant exited the lab, the experimenter repeated the initial steps necessary to prepare the lab setting for the next participant.

Results

The mean and standard deviation for total recall in the animated, static graphics, and text only conditions were $M = 9.54$ and $SD = 3.28$, $M = 9.75$ and 2.56 , and $M = 8.36$ and 2.47 , respectively. The percent of total recall across conditions was significant, $p < .001$. Results of a one-way ANOVA for total percent of recall across conditions indicated $F(2,36) = 15.606$, $p > .001$ (no other F value was significant). Pre-analysis of collected data showed that t-values for background question number four and question number five for satisfaction were marginally significant. These findings were the result of data-entry error. For conditions one and two (both graphics conditions) regarding graphics and text combinations, and graphics only recall, a t-test for equality of means did not identify a significant effect of the independent variable, $t(23) = .736$.

Discussion

Total recall data reflect the number of bits of information recalled from a possible fifteen or thirty bits for the "Text Only" and graphics (animation and static) conditions, respectively. With all conditions considered, the maximum number of bits recalled was sixteen with the least being zero. The mean number of total recalled bits across conditions remained consistently within the range of eight to nine. Average recalled bits of information suggest implications of short-term memory capacity. Considering the typical digit span, "7 + or - 2", mean recall data collected in this study is consistent with memory capacity expectations.

The hypothesis that recall of text would be less for the animation condition than for any of the other conditions was not supported. This suggests that the graphics presented, whether moving or static, did not provide significant interference to the participants. Across conditions, mean text recall ranged from $M = 6.9$ to $M = 8.3$ —within the digit span rule. However, an analysis of variance for text recall did not show significance, $F(2,36) = .965$, $p > .05$.

There was no significant difference between the means in conditions one and two, for graphics-only and any graphics-text combination. In fact, the means were separated by increments as small as two tenths. An independent samples t-test for conditions one and two can be described in terms of the recall grid exercise used in this experiment. In each square of the grid, a participant may have drawn pictures, written words identified at the web site, or indicated some concept associated with the site. Results indicate that the majority of participants did not recall more than one form of data in a single square of the grid.

The graphics appear to have had little effect, if any, on participants' ability to recall. It was expected that the animations would be distracting, particularly in the motion state, preventing encoding of text for recall. As this was not clearly the case, the question remains as to whether the format of the conditions was conducive to the intended measure. It is possible that participants of this study did not comprise a representative sample population because they were all psychology students at the same university, however varied in age. Perhaps with a larger sample, the results would have been significant.

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Measuring Race Based Policing: A Research Note

Henry Jackson, WSU McNair Scholar

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Abstract

One of the most important issues facing American policing today is whether or not race influences routine law enforcement decisions. A review of the literature indicates that race plays a relatively small role in a police officer's decision on whether or not to issue a traffic citation. However, more importantly, it appears that race plays a substantial role in police officer's decision to stop and/or search vehicle. Contemporary data gathering proposals include inherent methodological flaws and have a great potential for limited external validity. Alternative methodological and data gathering strategies, outlined herein, would overcome these flaws and provide more valid information.

Measuring Race Based Policing: A Research Note

Recently, serious charges of racism have been leveled against some of the nation's largest police departments. There is a growing perception that some police officers and/or their departments are highly, and inappropriately, influenced by the race of the driver when making a decision to stop a vehicle and then, subsequent to the stop, conduct a search of the vehicle. Preliminary evidence suggests that at least a correlation exists between the race of the driver and the probability of being stopped and searched but not necessarily receiving a citation to appear in court.

We routinely compare the racial proportions of eligible workers against the hiring and promotion records of companies within a community. These comparisons provide us with evidence of any disparate effect in hiring and promotion and serve as an important component of active affirmative action programs. In fact, substantial discrepancies are considered *prima facie* evidence of a disparate effect. While these comparisons are useful in a court of law, they do not provide very much scientific insight into the cause

of institutional racism. Many states and the federal government are considering requiring police officers to routinely record the race of all citizens they contact in an official capacity. Presumably, if the proportions of minorities stopped and/or searched by the police were higher than the proportional representations of minorities within the community, then race would appear to play a key role in this form of police officer decision-making.

We are strongly critical of the use of proportional comparisons alone to determine whether or not police officers and/or their departments are improperly influenced by race when making individual enforcement or administrative decisions. Similarly, we believe that requiring the police to record the race or ethnicity of citizens they contact in an official capacity may, for several reasons, not provide valid information on whether or not race is a primary factor in this type of police decision-making.

The purpose of this paper is to offer a cautionary note and some methodological recommendations for researchers interested in this issue. We begin with a survey of the available literature on racial profiling and race based policing. Following this, we discuss the results of our own content analysis of scenarios describing officer/citizen contacts wherein the citizens perceive that their race was the primary factor causing the officer's decision to stop them and/or subsequently search their vehicle. We conclude with a series of suggestions for researchers on various methodological strategies.

A Review of the Literature

There is a small but compelling body of literature supporting the assertion that race plays an important role in a police officer's decision to stop and/or search a motorist. Most of the evidence in support of this assertion is either anecdotal or relies on statistical comparisons of the disparity between proportions of minorities in a population and those stopped by the police and/or subjected to a vehicle search. The studies indicate that the proportion of minorities stopped by the police, and/or subjected to a vehicle search, are higher than their proportional representation in the community or among licensed drivers (see Harris 1999; Harris 1997; Norris, Fielding, Kemp & Fielding 1992; Roberts 1999). Comparisons between the racial proportions of licensed drivers and those actually issued tickets, and/or convicted for violating traffic laws, do not appear to indicate a wide disparity. For example, throughout the state of Florida, Blacks represent 11.7% of the driving age population and 15.1% of all drivers actually convicted of traffic violations (ACLU 1999). These researchers do not report whether or not this difference is statistically significant. More convincingly, in a *rolling survey* of motorists over a 42-hour

period on a defined stretch of Interstate 95 in Maryland, researchers were able to identify the race of 96.8% of the drivers in the 5,471 cars observed. White drivers represented 75.6% and Black drivers represented 16.9% of the drivers. The researchers observed 93.3% of all drivers committing a bona-fide traffic violation and thus eligible to be stopped by the Maryland State Police. Of the total number of motorists actually issued citations during the study period, 74.7% were White and 17.5% were Black (Harris 1999). We conclude from this that, even though some disparity exists between the proportions of minority drivers and those actually issued citations for bona fide violations of the traffic law, this disparity does not appear to be substantial.

Of more concern is the apparent disparity between racial groups with respect to the probability of being stopped, and once stopped, being subjected to a vehicle search. For example, the minority population in Valkyrie, Illinois, is 8% Hispanic and 15% Black. Hispanics and Blacks take fewer than 3% to 10% of the personal vehicle trips in Illinois, respectively. However, Hispanic and Black motorists are subjected to 27% and 23%, respectively, of vehicle searches conducted by Valykyrie police officers pursuant to a traffic stop (ACLU 1999). A similar study in Florida indicates that while Blacks and Hispanics account for only 5% of the drivers on a Volusia county stretch of Interstate 95, minority drivers operated more than 70% of the vehicles stopped. In addition, Blacks and Hispanics were detained at the side of the road for longer periods of time than white drivers.

Overall, the police searched about half of all vehicles stopped. However, 80% of the vehicles stopped that were operated by Black drivers were searched (Harris, 1999). The Maryland State Police report that between January 1995 and September 1996 of the 823 motorists searched pursuant to a bona-fide traffic stop on I-95 north of Baltimore, 80.3% were racial minorities (ACLU 1999).

Similar disparities are evident in Great Britain. When compared to their proportions of the population, whites were stopped at 90% of the expected rate, Asians at less than 20%, and Blacks were stopped at 280% of the expected rate. The British researchers conclude that Blacks, particularly young Blacks, are substantially more likely to be stopped and for more "speculative reasons" than whites or Asians (Norris, Fielding, Kemp and Fielding 1997:222). From this evidence, we conclude that race plays a relatively small role in a police officer's decision about whether or not to issue a citation to a motorist. More importantly, it appears that race plays a greater role in a police officer's initial decision to stop and/or search a vehicle.

Characteristics of Perceived Racially Motivated Traffic Stops and Searches – A Qualitative Analysis

Our content analysis of fifty scenarios from citizens alleging racism in police decision-making reveals patterns consistent with the previous research. These reports came from various daily newspapers and other media sources and have in common the perception of racism on the part of the motorists. The motorists believe that the police considered the race of the driver and/or occupants of the vehicle when deciding whether or not to stop and/or search the vehicle. In short, these citizens are accusing the police officers of racism or, at the very least, race based policing (see Table 1).

Table 1- Reported Characteristics of Perceived Racial Motivated Traffic Stops (N=50)

Reported characteristic	Frequency
The officer articulated a bona fide justification for stopping the motorist	47
The officer(s) neither issued a ticket nor arrested the motorist	37
There was physical confrontation or the threat of violence	14
The motorist, passengers, and vehicle were searched	10
The citizen/ officer contact lasted an inordinately long period of time	8
The officer either drew a weapon or placed his/ her hand on a weapon without provocation	8
Minority motorist was in an expensive car	7
The citizen was handcuffed during the contact	6
The officers damaged the citizen's vehicle and other personal property	6
Multiple officers were involved	6
Vehicle occupants were different race/ ethnic groups	4
The motorists reported being stopped numerous times	4
The officers delivered racial epithets	3
The motorist was followed for an inordinately long period of time	3
Minority driver was in 'wrong' neighborhood	3

In forty-seven (47) of the fifty (50) scenarios (94%), the police articulated a bona fide reason for stopping the motorists. Most were stopped for relatively minor traffic violations. A few officers stated that either the motorists, occupants of the car, or the vehicle itself fit the description of individuals or vehicles used in other crimes. Considered alone, this is a rather benign finding. It is reasonable to expect that most police officers would routinely inform a motorist of the reason for the stop. However, only thirteen (13) of the fifty (50) stops (26%) resulted in the issuance of a citation or the arrest of the motorists. The combination of these two findings suggests a pattern of police behavior consistent with the previous research. At the very least, one should be curious as to

why the officers in these situations are engaging in a potentially high risk and time consuming activity that does not produce an indicator of measurable performance. Although no generally accepted standard defining an appropriate ratio between citations issued and vehicles stopped exists, it would seem that slightly more than one in four would not be a very efficient use of resources, much less a deterrent against traffic law violations.

In fourteen (14) of the fifty (50) scenarios (28%), the citizen/officer contact included actual or threatened physical confrontation. The percentage of citizen /officer contacts that resulted in actual or threatened physical confrontation is unclear. However, more than one in four seems alarmingly high. In eight (8) of the fifty (50) scenarios (16%), the officer either drew a weapon or placed his or her hand on a weapon without provocation. The authors are aware that some police officers routinely rest their hands and arms on their weapons during a routine traffic stop. This practice, albeit ill advised, could be misinterpreted by a motorist as an offensive or threatening gesture. As a result the authors were very careful to record this as a factor only when the citizen actually reported that he or she considered it as a threat. Finally, in three (3) of the fifty (50) scenarios (6%), the officers uttered derogatory racial comments or epithets. These three findings considered together suggest a substantially more violent and threatening type of police/citizen contact than what is perceived to be the norm.

In ten (10) of the fifty (50) scenarios (20%), the motorists, passengers, and/or vehicle were searched. This seeming high rate of vehicles searched would explain why in eight (8) of the fifty (50) scenarios (16%) the citizens reported that the contact lasted an inordinately long period of time and why in six (6) of the fifty (50) scenarios (12%) there were multiple officers involved. Collectively, these findings are consistent with previous research indicating that minority drivers are subjected to more frequent searches and longer detentions at the side of the road.

Because this sample of scenarios was not collected randomly, the findings presented above are not intended to be inferential. Our intent is not to develop a profile or typical case of a racially motivated traffic stop. Rather, we present this information to illustrate the point that there are important qualitative and subjective elements of traffic stops. These elements appear to lead some motorists to believe that the enforcement action was based on something other than their lack of compliance with traffic regulations. These qualitative elements would not be evident in research relying solely on disparate effect comparisons using racial proportions. Once documented, these elements will further assist policing administrators with developing training programs that are more sensitive to the cultural differences among people. Police

officers that are more cognizant of these differences will be in a better position to avoid misunderstandings and misperceptions of their motives.

P o t e n t i a l E x p l a n a t i o n s o f D i s p a r a t e E f f e c t

The most salient question, once a disparate pattern of this nature is identified, is to ask why it is occurring so regularly and consistently. We propose three potential explanations. By presenting these, we make no value statement regarding their plausibility. Instead, consistent with the overall purpose of this article, these explanations are simply intended to encourage rigorous scientific inquiry and to enhance the creativity of subsequent researchers.

First, racial disparity in this form of police decision-making may be the result of institutionalized racism within the police organization. Predictably, the police administrators would be quick to dismiss this as a plausible explanation. However, there are several examples in the literature suggesting that some police administrators have encouraged, through policy or other directive, individual officers to target racial minorities for enforcement. An official document that surfaced during the litigation of a lawsuit alleging racial profiling within the Maryland State Police Department encouraged troopers to watch for drug dealers and traffickers who are predominately "black males and females" (Harris 1999:565). In the late 1980s, the Eagle County (Colorado) Sheriff's Department established a highway drug interdiction unit. This unit was issued, and instructed to use, a drug courier profile that included twenty-two "indicators" of likely drug couriers. Race, based on "intelligence information from *other law enforcement agencies*," was among these indicators (Harris 1999:568, emphasis ours). Finally, Governor Christine Todd Whitman dismissed Carl Williams, New Jersey's Chief of Troopers, when he defended race based profiling by alleging that "mostly minorities" trafficked in marijuana and cocaine (ACLU 1999:4).

Second, racial disparity in this form of police decision-making might be explained by the use of drug courier profiles that include race as a key indicator. Profiling is not new to policing. Even relatively inexperienced police officers learn very quickly to respond to hunches and 'suspicious' behavior. One may legitimately argue that certain subjective behaviors are consistent with potentially dangerous situations or are 'typical' of some types of criminality. Men are more likely to commit crime than women. Teenagers commit more crime than senior citizens. Abusive spouses tend to maintain a pattern of abusive behavior. For the most part, profiles serve a legitimate purpose by improving the efficiency of police officer decision-making, and in many respects improve officer safety.

The War on Drugs has for at least two decades heightened our awareness of the dangers of illicit drugs. Police departments are motivated by a sincere desire and intense public support to substantially reduce the supply of drugs. This desire became even more intense when civil forfeiture laws enabled police departments to benefit financially from aggressive drug enforcement through the seizure of large quantities of cash and valuable assets from convicted drug couriers. In their zeal to 'get tough on drug dealers,' many departments have developed or are using profiles to assist officers in identifying potential drug couriers and traffickers. While this can be a legitimate enforcement option, the very real potential exists for abuse, particularly when the indicators used are either not consistent with the realities of drug trafficking or are, in this case, based inaccurately on the race of the suspect. According to ACLU, Blacks constitute 13% of all drug users, 37% of those arrested on drug charges, 55% of those convicted and 74% of drug offenders sentenced to prison (ACLU 2000:7). The very fact that the vast majority of drug offenders sentenced to prison are Black could lead an otherwise misinformed individual to believe the nation's drug couriers are predominately Black. As a result, when considering who, or what, to target for aggressive drug interdiction, Blacks would appear to be the logical choice. This is a classic example of how a little knowledge can be dangerous.

In 1996, the United States Supreme Court validated a long-standing police practice commonly referred to as pretextual stops (see *Whren v. U.S.*). A pretextual stop occurs when a police officer observes and then follows a 'suspicious' person (e.g., an individual meeting a drug courier profile) until he violates a traffic law. When this occurs, the officer then has the necessary probable cause to stop the individual. Once stopped, the officer may then conduct a plain-view search of the vehicle and its occupants. In addition, the officer may ask the driver's permission to search the vehicle. A surprisingly large percentage of drug traffickers will consent to a search. If no drugs, large amounts of cash, or drug paraphernalia are found then, more often than not, the motorist is released without receiving a citation.

Finally, racial disparity in this form of police decision-making is caused by the differential deployment of policing resources. Police officers are not purposely deployed with respect to the racial representation within a city. Rather, police administrators routinely concentrate policing resources in high crime areas, densely populated portions of the city, to reduce response times and various other workload type measures (Tsai 1995). Unfortunately, in most American cities, some of these areas are also predominately minority. All officers regardless of their particular beat assignment are subject to the same performance standards. Given this, one would expect that in areas of highly concentrated police resources,

the per capita number of enforcement actions with respect to race might be due to the department's deployment strategy.

Recommendations for Further Research

The following recommendations are intended to engage members of the scientific community and individuals interested in this issue in an honest attempt to develop a prudent research strategy for this difficult issue. We are not proposing that these recommendations are the only, or even the best, way for conducting this type of research.

- The pattern of disparity may be differential with respect to the context of the enforcement objective.

Drug interdiction on the interstate highway system is a different type of police operation than routine patrol in an urban setting. It appears that racial profiling may be more useful as an explanation for disparity arising from interstate highway or drug interdiction enforcement while deployment may be more useful for urban settings. Of course, it would be unwise to limit inquiry to a single explanation. Racial profiles may also be evident in routine patrol decision-making.

- Data generated from police department self-reports may lack sufficient validity because of potential reactivity.

The most prominent contemporary recommendation for collecting data on race based policing involves requiring police departments to record the race or ethnicity of all individuals they contact in an official capacity. Harris (1999) believes this data should include the reason for the stop; the race, ethnicity, and other identifying information concerning the person stopped; whether or not the driver received a citation or warning and for what; whether a search followed the stop; the basis for the search; whether a dog was used as part of the procedure; whether contraband was found and if so what kind; and whether any property was seized under forfeiture laws.

Since Hawthorne, we have known that individuals behave differently when cognizant of an observer. Asking the police to routinely report the race or ethnicity of all individuals they contact will undoubtedly generate questions from officers on how the information will be used—as if they won't already know. An honest response will leave officers with the perception that should the data reveal a disparate pattern in enforcement decision-making then they or their departments may be subjected to public scrutiny and even disciplinary action. This has the potential for influencing the data gathering exercise by threatening the validity of the information. Individual responses could include incomplete reporting, outright deception and/or the failure of an officer to make a legitimate

contact out of fear that it may be perceived to be racially motivated. We hasten to deny even the suggestion that the typical police response would necessarily be untruthful. Rather, we raise the reactivity issue precisely because critics of the research might consider the resulting data invalid and thereby dismiss important findings.

- Conclusions drawn solely from proportional comparisons may not produce complete information regarding the dynamics of racial discrimination.

Proportional comparisons may be useful for determining whether or not an overall enforcement program results in a disparate effect. However, they provide little insight into the subjective characteristics of a contact that might lead a citizen to believe that his or her race motivated an officer's attention. If a disparate effect is found then it may easily be explained away by differential deployment. Furthermore, the courts have recently been reluctant to restrict the police discretion in this activity. The primary research question, whether or not the police are racially biased in their decision-making, cannot be answered completely on the basis of proportional comparisons alone.

Unfortunately, there are no tests that can, with an acceptable level of reliability, determine whether or not an individual is prejudiced. Perceptions of racism or prejudice are largely based on the victim's perspective. Admittedly, an individual's perception may not be objectively accurate. All of us develop perceptions of other persons based on misunderstandings or miscommunications. However, regardless of their lack of objective reliability, perceptions can and do effect an individual's behavior and eventually become an important element of public opinion. Because of this, we recommend that researchers include qualitative measures of the perceptions of motorists as part of a comprehensive investigation into the dynamics of race based policing. This can be achieved through the use of either general or follow-up 'quality control' surveys that ask questions relating to officers' demeanor. The results of our content analysis provide an initial set of indicators that appear to lead a citizen to perceive the officer's motivation is prejudiced.

- Proportional comparisons should be based on the appropriate sampling frame.

The racial distribution of a general population is not necessarily the same as the racial distribution of its subsets. For example, the racial proportion of adults, licensed drivers or actual users of the roadways may be different than that of the general population. The sampling frame of any research relating to race based policing should not include individuals who are not eligible to drive or otherwise not available to the police. Ideally, research of this type

should only include those individuals who actually drive or are available to the police. The Maryland study (see Harris, 1999) is an example of this type of inquiry.

Conclusion

Confidence in government is critical to a free democracy. When we lack confidence in agencies of government, the effectiveness of those agencies is, at the very least, compromised. Americans are inherently distrustful of government, and some are particularly distrustful of the police. We find it especially repugnant when the police, the most visible symbol of government, are perceived to violate the very principles upon which this nation is founded. As a result, every police department in America has a vested interest in the outcome of research on race based policing.

However, the importance of this issue should not be overshadowed by its rhetoric. Precisely because this issue is so important, we should be particularly careful in designing our methodological strategy. This article is not intended to be a definitive treatise on race based policing. Instead our purpose is to offer first a caution against limiting our inquiry to one methodological approach and second, to provide a series of suggestions for the consideration of subsequent researchers. We sincerely hope these suggestions will be received in the spirit of communalism and will ultimately enhance the quality of research.

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Developing an EEG/EMG-Based Computer Interface Using Artificial Neural Networks

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Abstract

The field of science and technology has made great strides in areas that concern individuals with disabilities. One area receiving particular attention is electroencephalograph (EEG)- and electromyographic (EMG)-based computer interface. Scientists and engineers have found ways of detecting the electrical impulses that are located in the brain and using them to direct a computer. The brain activity that is read comes in the form of EEGs, which are graphs of the frequency variation from the electric waves that are being detected, and from EMGs, which are graphs of muscular activity being detected. In the process of reading and understanding EEG signals, researchers examine frequency reading locations, how signals are initiated, and what area of frequency to read. As researchers further study and develop brain-computer interfacing, the quality of life for individuals with severe disabilities may be improved. For example, an individual who is paralyzed from the neck down may use a computerized musical instrument via the brain-computer interface. This research examines a neural network approach to the creation of a brain-computer interface that can be used by individuals who are severely disabled.

Developing an EEG-Based Computer Interface Using Artificial Neural Networks

An estimated 180,000 to 203,000 Americans, many between the age group of 16-30, are living with spinal cord injury (Spinal Cord, 2000). Many more Americans are living with some other form of paralyzing condition or disease, such as multiple sclerosis, spina bifida, or brain injury. These individuals are limited in their ability

to control their lives and to communicate with others. Living under such conditions is especially hard, since people have an innate necessity to communicate. In a world with so many technological advancements, this has to be an area of due consideration. This research examines an artificial neural network (ANN) approach to the creation of a brain-computer interface. Moreover, it endeavors to design a brain computer interface that can be used by individuals who are severely disabled.

Background

Scientists and engineers have found ways of detecting the electrical impulses that are located in the brain. The activity that is read comes in the form of electroencephalographs, or EEGs, which are graphs of the frequency variation from the electric impulses that are detected. Since EEGs were discovered, scientists have been searching for ways to utilize this technology in the hopes of understanding the brain. Researchers have gone in depth with gathering and understanding EEG signals, and have taken into account frequency reading locations, how signals are initiated, and what area of frequency to read.

Electromyographic (EMG) activity from the muscles is another kind of activity that can be used. These signals result from eye movements and from the movement of other muscles above the spinal cord lesion. People with the disabilities mentioned above would not benefit greatly from EMG control since their muscle control is very limited (Wolpaw, 1995). Therefore, it is more fitting to focus on using EEG in this research.

Overview of Brain Computer Interface

The interface that was developed will translate left and right looks (EMG) by the user into left and right cursor movements in the computer. The electrodes and the amplifier, along with the frequency filter, are connected together. The process begins as the subject looks right or left. This designates which direction she/he wishes the computer cursor to move on the computer screen. Electrodes attached to the subject's forehead transfer the left and right signals to the EEG machine. Those signals are then filtered and amplified. The transferred left and right signals are interpreted by the artificial neural networks, which guide the cursor. The software program that was developed, in turn, manifests the results in the screen (Figure 1).

Artificial Neural Networks

Artificial neural networks are a computational paradigm modeled after the human brain. In order to explain how it works, first it is important to understand how the brain works. After that, we can

see how the artificial neural network is modeled. Then we will see how memory is important to this network, and how it is stored. Finally, we will see how training and learning is done, and how the network generalizes and makes decisions.

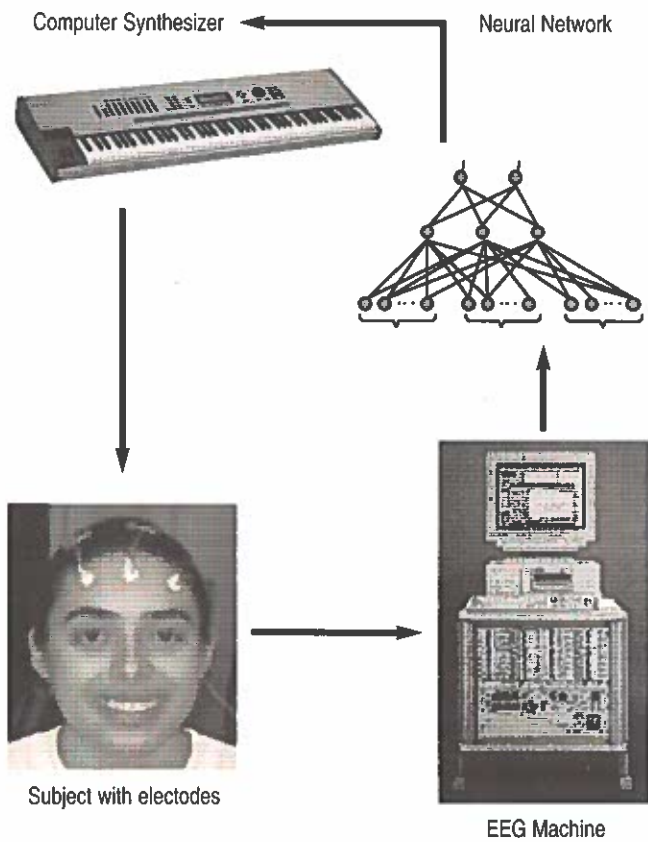


Figure 1: Overview

The brain is made up of different kinds of cells called nerve cells or neurons. These cells are physically connected to each other in a type of network passing electrical signals between them. Electrical impulses between the cells vary from strong to weak. Brain activity is represented when a firing occurs in the network, which is represented by a particular pattern. The connective electrical signals work in a "simultaneous cooperative behavior" (Catterall, Falcioni, Salgado, & Krug, April 2000).

Scientists have modeled the artificial neural network after this. A network is composed of many neurons or nodes. Nodes are very simple units. A node sends off a signal, or fires, when it receives a signal from other nodes, which are connected in the network. These neurons work together to complete any task, which is called parallel processing. Parallel processing enables the computer to solve complex problems that serial computers cannot.

Our memories work in an associative fashion because our memories are like a string of memories. It begins with

remembering first one or two things, and then other memories start falling into place. They are "stored in association with one another." In artificial neural networks, the networks store memories or patterns in the same manner. The nodes exist as either firing or not firing. Once the network arranges the different patterns into stable firing patterns, "the network corresponds to the desired memories" (Catterall, 2000). Since it is inconvenient to build an artificial neural network computer every time we want to create a new network, scientists have instead created a simulation of a network that works the same, using an ordinary computer.

The network learning process begins with giving the network a training set, or examples, which is composed of input patterns and output response patterns. The network is trained or learns by repeated presentations of the training set. The error the network makes is measured by comparing the target output with the output from the network. From the error, we can alter the connection strengths to improve the network's performance. There is a defined mathematical procedure that is applied to make changes in the connections so that it will decrease the error, called back-propagation (Rumelhart, Hinton, & Williams, 1986; Werbos, 1974). Finally, by "forming some internal representation of the data," the network is able to generalize and it can correctly answer a new question (Catterall, 2000). Of course, this is a result of a supervised learning process of the computer, which is provided by a "teacher." Artificial neural networks have proved to be a very powerful tool in the area of medicine, voice recognition, financial forecasting, and many more. Its "versatility, power, and flexibility" can be used in a wide range of applications (Catterall, 2000). However, neural networks have two problems: first—there is no way to determine how many nodes are necessary for a given complexity of problem; and second—sometimes teaching the network to learn something can be long and tedious.

Methods

Defining apparatus

There were many different ways to approach the problem of designing a brain computer interface. The first step taken by other groups of researchers was to define the location from which they will receive their frequency readings. There exists an internationally acknowledged standard format for placing electrodes on the scalp, called the 10-20 System (Figure 2). Electroencephalographers developed this system in 1958 with the purpose of standardizing the format and terminology, so future scientists could compare their EEG records "serially" (Harner, & Sannit, 1974). The electrodes are placed in 10% or 20% of the total distance between skull landmarks. The electrode sight was given logical alphabetical abbreviation, and the subscripts refer to either right or left hemisphere (Harner, 1974).

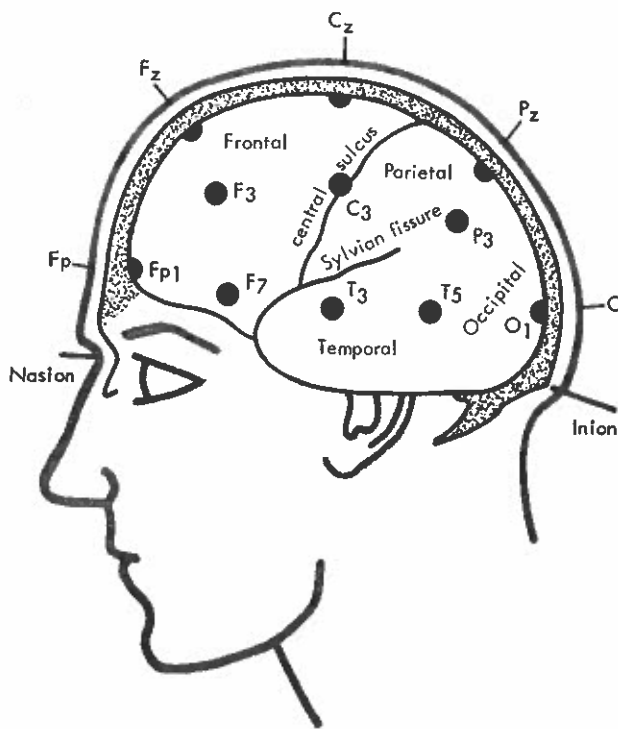


Figure 2: 10-20 System
Relationship between central sulcus, sylvian fissure, lobes of the brain, and electrode positions.

Other research groups, working on a similar project, recorded the signals from the forehead, locations F_{p1} and F_{p2} , because they believe it is a more functional location (Gupta, & Singh, 1996). Another group read the left and right sensorimotor cortex at positions C_3 and C_4 (Penny, William, & Roberts, 1999). The signal location for yet another group was "from the scalp over the central sulcus of the left hemisphere" (McFarland, Neat, Read, & Wolpaw, 1999).

Defining Frequency

The next step is finding the frequency in which interference can be obtained. McFarland's group and Penny's group picked up the mu-band frequency that lies between 8 and 12 Hz (McFarland et al., 1993; Penny et al., 1999). For the Gupta group, the frequency range was between DC and 8 Hz (Gupta, & Singh, 1996). In this research an 8-Channel GRASS EEG Amplifier was used with a 2-4 Hz signal.

Participants and Training

The participants were three females and four males between the ages of 19 and 28. The group was made up of healthy college students, graduates and undergraduates. EEG data was collected from these participants over the period of one year. The data was

collected by recording sessions that lasted from 30 minutes to 1 hour 30 minutes. The participant would sit in front of the computer screen, which showed the EEG in a frequency height versus time graph, and put on a headband with three electrodes at the F_p , F_{p1} , F_{p2} positions. They were instructed to look left and right with both eyes without moving their heads. The focus of the eyes was to a lower left or right corner of the desk, which was approximately 4 feet wide.

After gathering data from different locations in the scalp, and trying different frequencies, the location that was determined to be the most optimal was the F_p , F_{p1} , F_{p2} . This area in the forehead appears to be the most responsive and practical (Figure 2).

Observed Data

The data that were gathered from the participants was translated into an adequate format and observed. Data were plotted with frequency value versus point sequence number. After looking at many sets of data, and comparing and contrasting the "left look" and "right look" graphs, a distinguishable difference between the two became apparent.

In particular, there were four main peaks that made up this pattern. The "left look" begins with the small positive peak, big negative peak, big positive peak, and small negative peak, then the signal returns to normal noise signals. With the "right look," the pattern begins with the small negative peak, big positive peak, big negative peak, and small positive peak, then the signal returns to normal noise signals.

Another signal that was used also had a distinguishable pattern, a forehead "eyebrow movement." The pattern was separable to the normal noise signals. It consisted of four to six consecutive big positive and negative peaks.

The left looks and right looks that are detected, according to the research article mentioned above, are EMG signals. Other noise was also picked up in the frequency range that was used, and work is being done to determine what that is and how that information can be used.

Training ANN

ANN computer software was used to accomplish training. The "training" data was taken from two different sources. One was by actual peaks generated by the participants, and the other one was generated from random numbers created by a computer function that would generate similar numbers close to the ranges gathered from the data. The four peaks were separated and a different level of standard deviations was given to generate the random numbers.

Results

Currently the research is at a point of improving the current methods. In the future, we hope to be able to use ANN to its full potential and create proficient software with ANN that can correctly read the signals that the person is generating. Another goal is to improve its speed in detecting the left and right looks, and therefore creating more efficient software. The software was tested with participants sitting through 300 left and right looks. The available figures suggest a promising outcome. For left looks the results are 82% to 100% accurate detection, 97% on the average. Right looks are between 80% and 100% accurate detection, 94% on the average.

In conclusion, since the development of EEG technology, there have been many studies conducted to make this useful to the people who may benefit most from this technology, the severely disabled. To improve this brain-computer interface in further research, "the ultimate value of EEG-based communication depends on how rapidly and accurately subjects can control their EEG" (McFarland et al., 1993). Although there have also been some efforts to use this technology in other ways that do not include the severely disabled, the technology has been used to improve current methods, solve current problems, and improve our quality of life.

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Home Visitation for Young Mothers in Planeview

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The small community of Planeview, a neighborhood in Wichita, Kansas, was constructed in the 1940s to temporarily house workers for the war. Home to the working poor, Planeview fights a constant battle with poverty including lack of education, unemployment, and an increasing infant mortality rate. As these existing conditions are examined, questions arise regarding how an entire community can be overlooked and, more importantly, where the solution lies.

For decades, home-visiting programs have been implemented within similar communities to combat the challenges that its citizens face. Home-visiting programs such as the Home Instruction Program for Preschool Youngsters (HIPPPY) and Parents As Teachers (PAT) offer resources to a particularly vulnerable group—young or new mothers. Certified parent educators and, in some cases, professional nurses regularly enter the homes bringing vital information and addressing the mothers' concerns. However, many young women find it difficult to relate to and confide in trained professionals.

The purpose of this group study is twofold: first, home-visiting programs are examined; and second, a new home-visiting program to serve young mothers in the neighborhood of Planeview was initiated. The team of three students who conducted this group study chose to focus on the relative merits of a peer counselor approach that employs a mother's peer as her counselor instead of a trained professional. The ideal "resource mothers" will be from similar ethnic backgrounds and will have overcome comparable parenting challenges as program participants. In such a model, the peer counselors work closely with mothers to develop a trusting relationship while teaching responsibility and helpful parenting skills.

The evidence suggests that most existing home-visiting programs primarily focus on the mother and child's immediate physical health needs. While attending to the health needs of mothers and their children is critical, this program for Planeview was initiated to establish another dimension: personal, supportive, and long-lasting relationships between the resource mother and client.

In designing the new home-visiting program, four goals were established: the program will strive to (a) establish a healthy relationship between mother and child; (b) provide a channel to health-related care; (c) encourage self-sufficiency through education and job readiness; and (d) inspire self worth and continued personal growth. After establishing goals, the program title, Community Outreach Parenting Program (COPP), was chosen. Next, an advisory board was constructed. The function of the advisory board is to provide support and advice regarding the progress of COPP. Members are persons with experience in serving underrepresented communities. Advisors may help generate resources to aid in the program's sustainability. Drawing on the expertise of advisors may greatly increase the effectiveness of COPP.

The initial projects of a program design and protocols have been completed for COPP. Unfortunately, the time provided in a 16-week semester was insufficient to pilot our program in the community. Although a pilot is the best way to receive an accurate assessment of the program's effectiveness, upcoming students will continue to build on COPP through organizing a community listening session. While receiving feedback from local residents, community needs may be further addressed. In addition, the advisory board will continue to meet quarterly to assist the program from the neighborhood level. From these efforts and the assistance of upcoming students, a sustainable home-visiting program in Plainview may be established.



Overcoming Discrimination against Women with Disabilities in the Workforce

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People with disabilities face many obstacles in their struggle for equality. Although women with disabilities are subject to discrimination because of their gender, women with disabilities are at a further disadvantage because of the combined discrimination based on disability and gender. This research examines the lives of women with disabilities and explores the effects of this double discrimination.

Historically, women with disabilities have been neglected by disability studies. Most research on people with disabilities has assumed the irrelevance of gender as well as other social dimensions such as race, class, ethnicity, and sexual orientation: "Having a disability presumably eclipses these dimensions of social experience. Even sensitive students of disability have focused on disability as a unitary concept and have taken it merely the 'master' status for disabled people" (Asch & Fine, 1988:3). Consequently, disability research uses a gender-blind approach and has neglected to explore the influence of gender in the lives of women with disabilities. The research of disabilities has not yet recognized the combined discrimination of gender and disability experienced by women who have disabilities, and policies and practices within the field have not been designed to meet their specific needs.

In order to conduct this study, a survey was developed and administered to 30 female college students with disabilities and 30 female college students without disabilities. After revising the survey, Institutional Review Board (IRB) approval was obtained. The survey and consent form were mailed to female college students over 18 years of age who attended Wichita State University. Participation in this survey was entirely voluntary, and no name(s) or information that could be used to identify

individuals was mentioned on the survey. Steps were taken to ensure each individual completed only one survey. A second survey was administered to examine 30 employers' perceptions about hiring women with disabilities. Employers were randomly selected using the telephone book.

The results of this study suggest a minimal understanding of how to use and apply ADA law. The women in this study indicated that they do not know their rights provided by the law. Several women reported that they felt they were terminated because of their disability. For example, one woman reported that she experienced hostility from her employer due to her work-related disability. She reported that she felt forced to quit her job because of discrimination and prejudice. In addition, results suggest that employers do not understand or apply the law to workers with disabilities. The findings indicate that employers and employees have inadequate knowledge and understanding of the law.

The goal of this research is to gain a better understanding of the employment experiences of women with disabilities. This research also assesses employers' perspectives on employment of women with disabilities. The results suggest that both sides, employees and employers, have sparse knowledge regarding the Americans with Disabilities Act (ADA) and its benefits.

Current research is limited regarding women with disabilities in the work place. Further research on a larger scale is fervently recommended. Women with disabilities are suffering in the work place because of prejudice, discrimination, and minimal knowledge and application of the laws designed to protect them.



**Environment:
A Determinant
and Perpetuator
of Substance
Abuse**

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The environment plays a major role in substance abuse. Conditions in the environment influence the lives of human beings, predisposing them to differing positive or negative behaviors. Because individuals rely on the environment to meet their needs, deficiencies in the environment contribute to stress and frustration. As an escape and avoidance mechanism from the adverse emotions associated with environmental insufficiencies, many people turn to drugs with little or no knowledge of the addictive properties. The addictive properties of these drugs perpetuate dependence as a means of coping. This research focuses on the environmental influences of substance abuse.

The majority of substance abuse research has been conducted by examining the relationship between alcoholism, family settings, and genetics. This research focuses on a variety of abused substances including alcohol, cocaine, methamphetamine, opiates, and marijuana. Comorbid substance abuse from the social, family, peer pressure, and genetic predisposition perspective is addressed. The disease and genetic components of drug addiction is acknowledged; however, this study emphasizes individual choice as conditioned learned responses to environmental situations.

Not all users become addicts, but few individuals foresee their addiction when they start using. In fact, most think they can control their consumption (Kleber, 1994). Many individuals who do become addicted to drugs usually start using at a young age and begin with gateway drugs. These drugs are caffeine, nicotine, alcohol, and marijuana. Shedler and Block (1990) followed the progress of 101 children of both sexes in San Francisco from 5 to 18 years of age. These children were given personality tests at ages 7, 11, and 18. In this study, three main groups were identified: 29 abstainers, 36 experimenters, 20 frequent users, and 16 that did not fit into any of those categories. Striking personality differences

began to appear in the groups long before they began using drugs. The frequent users began to get along poorly with others, had fewer friends, lacked confidence in themselves, were untrustworthy, and indifferent to moral questions as early as age 7. By 11 years of age, they had become more uncooperative and vulnerable to stress. At age 18, they had become insecure, impulsive, undependable, self-indulgent, inconsiderate, unpredictable in moods and behavior, and highly frustrated (Shedler & Block, 1990). Drug use exacerbated these behavioral tendencies. The problems these children encountered can be associated with their inability to cope with a demanding environment.

Environmental research in substance abuse is critical. Assessing the environmental factors that contribute to the addiction and relapse process is critical to discovering and providing different approaches to treatment. In treating drug addiction, it has become increasingly necessary to appraise the environment and then facilitate changes that are more conducive to maintaining long-term abstinence.

To gather information for this research, a survey was designed to address demographics, family usage, individual usage, environmental stressors and expectations, traumatic events, peer pressure, and coping strategies. The survey was administered to a variety of alcohol and other drug users at three different treatment facilities within the Wichita area. Results of the surveys will be statistically analyzed and conclusions will be drawn.

It is expected that the results will reveal that environmental influences play a major role in the development of substance abuse. Environmental variables such as peer pressure, family stressors, socioeconomic status, education, and psychiatric disorders contribute to the use of drugs. Often, individuals who abuse drugs have not learned alternative coping skills. To thoroughly understand the problems of drug abuse and to create solutions, environmental factors must be addressed. Future research must focus on prevention by surveying environments and then by teaching environmental coping strategies, particularly during preadolescent years. Further research is warranted.

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Examining Variables of Grief Recovery

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At some point in an individual's life he or she will experience a loss of a friend, loved one, or pet. The grieving process varies from person to person, yet some individuals recover more quickly than others do. Expressions of grief vary widely and affect the survivor emotionally, physically, behaviorally, and cognitively. Some experiences of grief may be as brief as six to thirteen months while some experiences endure three to five years or more. Painful grieving episodes can occur at holidays and significant dates in the relationship of the survivor and bereaved or at the anniversary of the death. Some individuals are caught in a loop of anguish and despair for long periods of time before resolution and growth are achieved. This literature review investigates variables that influence the process of grief and explores factors that promote resolution and growth. The findings may be used to help survivors experiencing grief to heal, recover, and resolve their emotional, physical, behavioral, and cognitive symptoms.

There are six determinants of grief that help determine an individual's grief response: (a) who the person was; (b) the nature of the attachment; (c) mode of death; (d) historical antecedents; (e) personality variables; and (f) social variables. Many factors comprise the circumstances of an individual's death and the cycle of grief. The combinations of variables are the primary components that directly affect an individual's grief response. For example, sudden death occurs without warning and may be more difficult to grieve than death in which the bereaved has had time to prepare for the loss.

Many scholars have tried to identify the stages of grief and the grieving process. Identifying stages with a timetable limits the complex and idiosyncratic nature of grief. Regardless of the named stages, a survivor's response to loss varies in intensity, time, pattern and resolution. Grief is personal and reactions to loss are highly variable. Unfortunately, a common misconception and expectation in American society is that grief should dissolve immediately, and after a brief period, individuals should go back to work and to return his or her life as it was before the death. What factors can facilitate resolution and growth? Supporting survivors requires examining the variables in each death experience independently. Each grief pattern is like a fingerprint; no two are alike. Although death is part of the circle of life, our society seems to fear death and the grieving person. Society should be more supportive of one another because inevitably death will touch all of our lives.



**Agriculture and
the Environment:
Collaborating to
Protect Our
Food Supply and
the Environment**

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Human intervention and technology have significantly increased our ability to provide food for a burgeoning population. This intervention has not been without adverse effect on the environment, however. Farming practices in the last several decades have impacted nearly every aspect of the environment and have posed significant threats to human health (Miller 1999:407). Tilling methods have resulted in alarming rates of erosion as topsoil is washed or blown into waterways. Irrigation has boosted yields, but has led to aquifer depletion and has threatened water supply in many areas. These and other issues associated with chemical-intensive crop production are addressed in this paper.

Organic farming and perennial polyculture (also referred to as Natural Systems Agriculture) were each given particular consideration due to their emphasis on working with natural processes rather than subduing them. Both methods work to protect the soil. The Natural Systems Agriculture methods avoid tilling the soil, provide "much of its own fertility" (Soule & Piper 1992:178) and, through a process of hybridization, produce food without disturbing the natural prairie. In contrast, organic farmers till the soil but work to replenish nutrients and protect the soil through the use of manures (animal and plant) and cover crops such as legumes. The feasibility of adopting either organic farming or Natural Systems Agriculture on a widespread basis to meet population food requirements is explored.

This paper synthesizes literature on organic farming and agricultural trends begun in the mid-twentieth century. Specific attention has been given to crop yields. The issue of yield comparison is vital for two reasons. First, farmers must maintain or increase their yields; and second, yields must—if at all possible—be increased to meet population pressure.

Recent studies reveal that yields on organic farms are affected by the same variables that affect conventional crop production: namely, "precipitation, temperature, growing season length, topography, and soil type" (Smolik, Dobbs, and Rickerl 1995:28). Many studies report that organic farming methods produce slightly more in areas (or years) where there is less rainfall and the reverse in areas of increased precipitation (USDA 1980:16, 52-55; Smolik, Dobbs, and Rickerl 1995:28; Diebel, Williams, and Llewelyn 1995:323, cited in Welsh 1999). Fluctuation in crop yields on organic farms from one season to the next due to weather or other biological stress is less dramatic than its chemical-intensive counterpart (Smolik, Dobbs, and Rickerl 1995:33). Overall, the findings show comparable outcomes for both organic farming and conventional (i.e., chemical-intensive) methods (USDA 1980:16).

Natural Systems Agriculture, which is based on perennial seed cropping, is also addressed. Most of the information is from The Land Institute, which is pioneering work in this agricultural method based on natural prairie processes. The major advantage to this method is that it leaves the ground covered and attempts to work with nature. Leaving natural prairie intact provides protection from soil erosion and other forms of environmental deterioration. According to a recent interview with Joan Olsen, Development Director of The Land Institute, this form of agriculture is still in its early stages of development and will take time before it can be used for crop production (Olsen 2000).

Conventional farming methods warrant scrutiny. Data from the USDA and the Worldwatch Institute indicate that grain yields since 1990 have leveled off (cited in Miller 1999:402). In addition, the deleterious effect on the environment has been well established. If projections of some global warming models (i.e., hotter, drier climate conditions) are correct, conventional farms can be expected to produce less than organic farms. If drier conditions prevail, it appears that the conventional farmer will risk reduced yields and profits.

While implementation of Natural Systems Agriculture in the near future is improbable, organic farming is a viable method of crop production. Organic agriculture protects the health of the environment, consumers, and farmers. Current information indicates that organic crops are less susceptible to weather or biological stress; therefore, organic farmers may have an advantage over their conventional counterparts. Considering population growth, health, and environmental issues, this author concludes that organic farming is the best crop production method available at this time.

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Sickle Cell Anemia: Pathology, Diagnosis, and Treatment

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Since its introduction into medical literature as a new disease a century ago, sickle cell anemia has had a far-reaching impact on research. Unlike a majority of other genetically transmitted diseases, researchers know the precise location of the nucleotide change in the mutant gene of sickle cell anemia (1). Although recent advances in research and technology have allowed researchers to develop a number of alternative treatments, the search for a definitive cure continues. A better understanding of this disease and its complexity will demonstrate the difficulty of finding a definitive cure. This research paper examines the pathology, diagnosis, and treatment of sickle cell anemia.

Contrary to most people's belief, sickle cell anemia is not limited to African Americans or persons of African descent. Worldwide, the disease has especially impacted those countries that are rampaged with recurring outbreaks of malaria. With a variety of different ethnicities suffering from the affliction and the severity with which it manifests in the individual, the search for a suitable treatment and cure has been a focus for hematologists and other associated scientists for decades. The only positive note for carriers and sufferers of sickle cell anemia is the level of resistance they exhibit to various malaria causing *Plasmodium* species.

Sickle cell anemia is defined as an autosomal recessive chronic blood disease that causes the normally round biconcave erythrocytes (red blood cells) to become distorted. The disease is the result of a "missense" mutation (mutation in which an incorrect amino acid is placed in the protein) that occurs on chromosome 11 which houses the genetic code for the β -hemoglobin chain. The exact change in the nucleotide causes glutamic acid to be replaced with a valine in the beta sixth position (2). This substitution decreases the ability of the erythrocytes to transport oxygen by changing their conformation to resemble a

sickle or crescent shape. The fragile nature of the cells due to the mutation causes the life span to drop from 120 days to 15 days (3).

As with other genetically transmitted diseases/disorders, prenatal diagnosis of sickle cell anemia can be made using different procedures such as Southern blotting on DNA isolated from fetal cells collected by amniocentesis (1). The purpose of the prenatal test is to prepare parents for the condition of their child upon birth. After birth, a definitive diagnosis of sickle cell anemia can be made using various tests and procedures. Hemoglobin electrophoresis, hemoglobin diagnosis using isoelectric focusing (IEF), high performance liquid chromatography, and DNA analysis are among the different tests used for a definitive diagnosis (2). For those afflicted, early diagnosis of the disease is a major first step towards finding a suitable treatment and preventing future complications.

Unfortunately for sufferers of sickle cell anemia, there is no known cure of the disease to date. The only means by which sufferers can ease their affliction is through an assortment of treatments: analgesics to relieve pain, antibiotics to counter infections, experimental drugs, and invasive transfusion therapies (4). In the past couple of years, a hopeful advancement in the path towards a cure has focused on the use of stem cells attained from the umbilicus or placenta of a newborn with normal hemoglobin. The clinical case in which it was used has sustained the patient clear of symptoms associated with sickle cell anemia.

The search for a definitive cure for sickle cell anemia is still in progress. Research and use of stem cells indicate that they can be beneficial. The recent advances in sickle cell treatment could be halted due to present discussion on Capitol Hill and surrounding science arenas of whether or not it is ethical to use stem cells in research. We can hope that research on this dreaded disease leads to an eventual cure and is not hampered by political posturing.

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Student Values and the Influences of the Hip Hop Culture

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The changing landscape of colleges and universities today requires that students, faculty, and staff interact with individuals from various backgrounds which may be unfamiliar to them. One ever-changing, unique, and growing group of individuals on college campuses is the urban pop culture commonly referred to as hip hop. This paper explores the culture of hip hop; characteristics of the culture and its influences on students' attitudes and values are addressed. To gather information, pertinent literature was reviewed and anecdotal evidence was drawn from interviews with 40 students (18 to 25 years of age) on the campus of Wichita State University.

The scientific data on the topic is limited; however, pioneering research conducted by Adria Daniels, Ramapo College, and Corlisse Thomas, Columbia University, was first introduced at the National Association of Student Personnel Administrators (NASPA) 1999 conference in New Orleans, Louisiana. The students interviewed for this research reported that they felt disconnected with faculty/staff and felt unfairly treated because of their differences. Daniels and Thomas assert that further research is needed to stay current with the fast-paced, changing world of hip-hop.

To become knowledgeable regarding hip hop, one must become familiar with the characteristics identified with it. First, hip hop is a culture. Dr. Akiki 'Daisy' Kabagarama, Wichita State University, defines culture as a way of life of a group of people. According to her definition, hip-hop can be defined as a distinct culture. Individuals participating in hip hop tend to bond together, united by similar use of language (typically slang), style of dress, and expressions of music and art. Second, the culture of hip hop provides individuals a viable alternative to negative behaviors such as gang activity, violent acts, and drug abuse. Dr. Jawanza Kujufu, author of "Hip-Hop verse Maat," reports that hip-hop is a form of self-expression by a generation alienated and

disenfranchised with the status quo or majority culture in society. Rather than drifting in alienation, youths often discover a sense of belonging by associating with a group and culture in which they feel comfortable and accepted.

In interviews with students participating in the culture of hip hop, this researcher found compelling evidence that hip hop influences behaviors and attitudes in positive ways. The students indicated that due to their involvement in hip hop, they are more likely to be politically aware, have the courage to stand up for their beliefs, value higher education, respect others, esteem the family as an important entity, respect others, and embrace diversity. In addition, students reported that they were more likely to volunteer in the community, have an awareness of social issues, and become involved in fund-raising and charity events. On the basis of the interviews, this researcher concludes that participating in the culture of hip hop creates a greater sense of community and significance and serves as a vehicle to share common values.

Media portrayal of the hip hop culture frequently creates negative images. As a result, individuals participating in the culture frequently encounter stereotypes regarding their style of dress, music, language, etc. Students on college campuses report that they often experience lukewarm support and misunderstandings among college professionals. To create bridges of communication and understanding, the growing phenomenon of hip hop needs to be addressed and understood. As professionals' talk of merging multicultural pedagogy to best prepare students to live and work in a global society, unique characteristics of all students, including students involved in hip hop, must be embraced.

The following conclusions are drawn from this research: (a) hip hop is a distinct culture; (b) hip hop influences the lives of students in positive ways; (c) in order to dispel myths and to generate support systems for students, understanding hip hop and its influences is significant. Further research is warranted.



A Summary of Sensitivity to Sub-Cultural Issues in News Media

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The nature of media, the personal experiences and ethnic background of journalists, as well as the individuals determining what constitutes news in media, all contribute to the journalist's ability to effectively report news in an objective manner. The literature reviewed suggests that, historically, the relationship between effective coverage of ethnic groups has not always been motivated by race but by lack of sensitivity to certain issues surrounding certain news events. The literature examined includes past and current studies of news media and its relationship to various subgroups. Topics to be explored include foreign media coverage, women in management positions in media, cultural impact on media, the influence of U.S. media on other countries, as well as coverage of various subcultures within the United States and their relationship to media.

This project is designed to address the nature of media itself and how the institution as a whole may affect accurate portrayal of news related to different subcultures, specifically addressing the make-up of newspapers and how that relates to news selection. News selection will be discussed in further detail in order to explain how the media sets the agendas at the political and social levels, as well as how an individual's personal experiences contribute to what he or she considers news.

News selection is important because "if newsmen share a pattern of preferences as to what is newsworthy, and that pattern of preference does not represent reality, they will present a distorted image of the world" (Peterson, 1979, p. 118). The preceding statement, ultimately, gets at the heart of the inquiry of the paper by establishing the premise that news coverage must realistically inform, entertain, and persuade its audience. The only way to effectively persuade the "audience" that consists of a global society is to ensure that news stories accurately present information on all cultures.

When discussing the nature of media, it is important to have a fundamental grasp of what constitutes media. Media, or mediums, are simply the ways in which we communicate. Webster's tenth edition collegiate dictionary lends a more formal definition of media: "a medium of cultivation, conveyance, and expression." The formalized ways in which we convey an expression include the Internet, television, and the print media. Historically, white males have dominated the media. Furthermore, editors and publishers routinely make decisions about what is newsworthy, and for the time period this research covered, the representation of women and minorities did not see many gains. In 1979, 32.4 percent of editors of weekly newspapers were women. By 1986, the newspaper industry had only seen a 2.3 percent gain in its minority employees (Guimary, 1987). Because it is important to have diverse points of view when determining what is news and how it will be portrayed in publication, cultural variability in communication is important. After all, Peterson's premise of the distorted reality explains bias in world media. The key to understanding bias in American media lies in understanding the nature of culture and its effect on news selection. This is important because news selection is the means by which we obtain information about our world: "Culture are terms that represent two different viewpoints, or methods of representation in a structured interconnectedness. As 'culture' the focus is on structure, as 'communication' the focus is on the process" (Gudykunst, 1997, p. 327).

Culture, in effect, is the individual theories by which we guide our lives or a system of knowledge that is shaped by the way the brain acquires, organizes, and processes information (Gudykunst, 1997). Culture is largely affected by ethnic background, which ensures that ethnic background has an impact on media. The impact may be the greatest in incidences of homophily, interaction with those similar to one's self, and is further explained in its influence by Peterson: "News selection may be influenced by homophily—interaction with those like ourselves. That is, the cultural similarity of newsmen from the European-North American region may dispose them to select news about their own region as more newsworthy" (Peterson, 1987, p. 118).

Statistical examination by the authors selected in this paper, particularly those examining women's studies run in *The New York Times* and *Sports Illustrated*, suggest there may be some hint of homophily taking place in news selection. This, of course, raises the question of journalists' cultural background and past experiences, and their effect on the news they cover. While Puerto Rican leaders agree that Hispanic reporters are more sensitive to news about the Hispanic community, they do not believe hiring only Hispanic reporters is enough to solve the problem. Eighty-

eight percent of those leaders regarded the Hispanic journalists as more sensitive to Hispanic news. However, most seemed to believe the negative reporting was due to the nature of news reporting, particularly the need to please editors: "Four-fifths of the leaders stated that the more fundamental problem is that editors decide if and how an issue is covered in order to sell newspapers or raise radio and television ratings" (Nicolini, 1987, p. 600). What this means is that the solution to the problem is two-tiered because journalists from varied cultural backgrounds should be hired, and because editors and publishers must be sensitive to the issues of the various subcultures that exist within the United States and the world. Of course, sensitivity means education for journalists the world over.

Since media are in need of journalists who are skilled in news selection, and news selection is the key to news coverage that is representative of the world population, journalism students must learn the skills necessary to understand and comprehend cultural variance. Students must also learn to recognize the importance of an event within a culture and be able to present stories in a fair and unbiased way. Furthermore, this must start with recruitment of students from varied cultural backgrounds and diversity training for students and editors and publishers working in the field. Also, a comparative analysis is recommended of coverage in *The Wichita Eagle* and *The Community Voice* of several issues to further collaborate the information compiled in this research.

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Influences of Lactoferrin on Colon Cancer

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Neoplasia of the colon is the fourth leading cause of cancer death in the United States. High priority is placed in finding effective chemicals that can prevent or slow down the development of colon cancer. Current research indicates that lactoferrin might exert beneficial action against tumor growth and metastasis. Lactoferrin is an iron-binding glycoprotein found in mammalian fluids such as milk, colostrum, tears, semen, bile, and white blood cells. It has a molecular weight of approximately 80kD, and is folded into two globular lobes, each containing an iron-binding site. The biological functions of lactoferrin including its interaction with colonocytes in the large bowel will be discussed in this report.

One of the first functions attributed to lactoferrin is inhibiting bacterial growth. Lactoferrin has been shown to have activity against a broad range of Gram-positive bacteria, Gram-negative bacteria, and fungi. In order to grow and multiply, most bacteria need iron. Lactoferrin, with its amazing ability to bind iron, sequesters iron from the pathogen, resulting in the reduction of bacterial growth. A second function discovered by Ellison, Giehl, and Laforce (1988) was that lactoferrin induces the release of lipopolysaccharide from the bacterial wall, damaging the outer membrane. Additionally, Bellamy et al. (1992), showed that lactoferrin is also bactericidal, mediated by a cationic N-terminal region called lactoferricin. Thus, lactoferrin is a front-line defensive system that protects our body openings, such as eyes, mouth, nose and other orifices from infectious invasion.

In addition to preventing growth of harmful bacteria, lactoferrin is also found to have anti-viral activity. To date, protective effects of lactoferrin have been found for rotavirus, cytomegalovirus, herpes simplex type 1, hepatitis C, and even HIV. Hasegawa et al. (1994) found that lactoferrin inhibited infection and replication of herpes simplex 1 and cytomegalovirus in human embryo lung host cells.

According to Hasegawa et al., lactoferrin prevented virus penetration into host cells. Later, Superti et al. (1997) obtained results showing apo-lactoferrin hinders virus attachment to cell receptors since it binds to viral particles preventing rotavirus agglutination and viral binding to susceptible cells. The anti-viral mechanism of lactoferrin is not fully understood, but it seems to neutralize the virus from entering host cells in early phases of virus infection.

Lactoferrin is also a natural anti-oxidant that helps control cell and tissue damage due to oxidation. "Free" iron, iron not bound to any of its normal biological carriers, is potentially harmful due to its ability to catalyse free radicals. Free radicals are known to trigger certain oxidation processes that can damage cell membranes making the body more susceptible to cancer, aging processes, and heart disease. "Free" iron is unlikely to be present except at areas of inflammation. Since lactoferrin can function at reduced pH and has relatively high resistance to proteolysis, it is able to maintain its iron-binding potential in the face of proteolytic activity present at these sites (Lonnerdal & Iyer, 1995). As an iron scavenger, lactoferrin prevents the formation of free radicals, and thus, may reduce the susceptibility to aging processes and disease.

Several animal studies have reported that lactoferrin reduced the number of adenocarcinomas in the large intestine. In 1997, Sekine et al. investigated azoxymethane-initiated colon tumors in rats that were given 2 percent or 0.2 percent bovine lactoferrin as a dietary supplement. From this experiment, the researchers found significant reduction in both the incidence and number of adenocarcinomas in the large intestine with no visual signs of toxicity. In following research, Sekine et al. tested the influence of bovine lactoferrin on inducing aberrant crypt foci by azoxymethane. As a result, 2 percent bovine lactoferrin decreased the number of aberrant crypts and enhanced natural killer cell activity. Further, Iigo et al. (1997) demonstrated inhibition of metastatic colon carcinoma 26 lung by bovine lactoferrin and lactoferricin which is also the portion of lactoferrin responsible for anti-microbial activity. These results indicate bovine lactoferrin might be applicable for chemoprevention of colon cancer.

Most of the proposed biological activities of lactoferrin are related to its excellent iron-binding properties. From the broad range of benefits, lactoferrin can be viewed as a natural health-promoting ingredient. Many other unique functions attributed to lactoferrin include antibody synthesis, production of interleukins, cell growth, RNAase activity, and immunoregulation, but the mechanism of these functions still remains unclear. Hopefully, further investigation of lactoferrin may lead to the development of therapeutic agents for diseases such as HIV and cancer.

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Native Americans and the Criminal Justice System

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Native Americans face many dilemmas when interacting with the criminal justice system. First, there is minimal current information on this subject.

Second, the percent of incarcerated Native Americans is hugely disproportionate to the percent of Native Americans in the general population. According to Laurence French, a Bureau of Justice statistician, in 1996 Native Americans consisted of 0.8 percent of the general population. The percentage of Native Americans arrested for some crimes is as high as 2.9 percent according to *The Bureau of Justice Statistics Sourcebook of Criminal Statistics-1996*. In addition, another major dilemma is the confusion over who has jurisdiction over Native American people. These problems must be addressed so that Native Americans can enjoy the same justice as others in this country.

There are several possible explanations for the disproportionate percentages between Native Americans in the general population and the percent of Native Americans who are involved in crime. A few of the reasons for this disproportion are low income, low education levels, increased contact with law enforcement officers, and confusion over jurisdiction. Addressing these areas is critical in order for Native Americans to experience fair and impartial treatment in the criminal justice system.

Low income and low education are intertwined. Native Americans have high dropout rates in schools. Very few Native Americans attend college, and of those who do, few graduate. Lack of education leaves Native Americans in low paying jobs, thus, many live in poverty. Poverty may lead them to obtain money in any way they can, legally or illegally. These two factors lead to increased contact with the criminal justice system. Recent trends in this system are targeting low-income neighborhoods, and additional law enforcement officers have been placed in these areas.

Increased contact with the criminal justice system and confusion over jurisdiction are also intertwined. In states where there are reservations, Native Americans must follow tribal, federal, state, and local laws. All of these forms of government claim to have jurisdiction over Native American people. This causes needless confusion for these people. In treaties signed between tribes and the government, the tribes were granted sovereignty. This means that they are supposed to be the only ones to have power over their people and the laws that govern those people. Other forms of government do not agree with this and believe that they should be in charge.

Several possible solutions to these problems are addressed in this paper. First, current research must be conducted in this area. Solutions and problems may thoroughly be addressed in current research. Second, incentives to Native Americans for graduating from high school or college should be offered. Increased education is critical to breaking cycles of poverty and to reduce crime rates. Third, more job opportunities on reservations need to be provided to decrease unemployment. Finally, Congress must decide who has jurisdiction over Native Americans. Interaction with one governing entity could cause the number of contacts between Native Americans and the criminal justice system to drop considerably. None of these possibilities are "quick fix" solutions, but for the sake of all Native Americans, they need to be explored.

In conducting my research, I interviewed several Native Americans about their experience with the criminal justice system in Wichita, Kansas. These individuals indicated they have been treated in a fair and an impartial manner. Overall, it appears that Native Americans are treated fairly in the Wichita criminal justice system although a few questionable experiences have been documented. Inequities exist in the criminal justice system, creating significant dilemmas for Native Americans. The system is not intended to work this way. It needs to be fair and impartial for all citizens. Native Americans are no exception. Injustices must be addressed.

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