



**The University of Texas at Arlington
McNair Research Journal**



Summer 1997 ~ Volume 1



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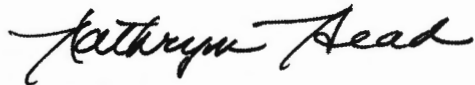
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Notes from the Director

It is with much pride and respect that I congratulate the 1997 Ronald E. McNair Postbaccalaureate Achievement Program scholars at The University of Texas at Arlington on their achievements this year. The results of their summer research projects as evidenced in the following pages are testament to the perseverance, dedication and scholarly ambitions of these outstanding students.

The scholars' achievements, I think, may attributed not only to their own hard work and seriousness of purpose, but also to the guidance and encouragement of their faculty mentors and to the unqualified support of the administration at the University. Together, outstanding progress may be realized.

Best wishes on future success. The McNair Scholars Program remains fully supportive and vitally interested in all of your academic endeavors.



Kathryn Head

Director

McNair Scholars Program

Acknowledgements

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Square On - Square Off For a New Millennium

Fernando Primero Jr.

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Abstract

The approach of the new millennium is revealing multifaceted urban economic and social structures that have very few relationships to the daily life of the city. With this media-driven, commercialized culture there is a need to evaluate public space in the city. Therefore the challenge will be to establish a new dialogues and spatial prototypes that are more universal and adaptable to the new urban conditions established by the media and shifting economic conditions. The research will explore and evaluate new urban design preparing themes for engaging such a public space. The project will be based on this preparation of design proposals for two international design competitions. Both competitions concern the relationship between public space and transportation infrastructures. The first competition is the design of a train station for a city of a population of 100,000. The second competition is the redesign of Piazza Isolo in Verona, Italy in order to define a viable public space and meet the new transportation demands of the city. The primary objective of the project is to understand the processes and methods employed in preparing a design proposal for a professional competition.

“In the course of my labors I suddenly stumble upon something unexpected. This unexpected element strikes me. I make a note of it. At the proper time I put it to profitable use. This gift of chance must not be confused with the capriciousness of imagination that is commonly called fancy.” -Igor Stravinsky

The process of development for such a method of design required extensive gathering of information. The information consisted not only of literary topics but was vital in introducing myself to quick time video clips, and incorporated a visit to Piazza Isolo in Verona, Italy. Visiting the site in Europe also exposed me to the train systems and gave me a better understanding of the stations role within a city. It is important to note that for this research to be successful I had to at times separate myself from my own personal actual design engagement and view the process as second person. One thing was to gather and help build models for the comparative analysis but the other, more importantly, was to recognize the „character”, order and dialogue that was generated in the way the information was transformed and interpreted. The overall success of this research was to actually witness and had have experienced how the conclusive narrative is realized.

For the development of the train station for a city with a population of 100,000 it was important to document the actual motion of the commuter

throughout a typical transportation system. It is not enough to just have general plans and layouts for being able to interpret what the commuter goes through with this intermodal system between street and train, car and train, and train to other train. Through the use of video recording of the commuters movements compared to creating a photographic journey, I was able to develop a better understanding for recognizing the stations important role in a city. The video camera also made it more convenient to view the events happening before me as a second person since I was an obvious stand out amongst the crowds. There were times that I did not even need to have the camera on, just pick it up and point. Through this type of created environment I was able to recognize how the stations have the power for revitalization of commerce and culture. Throughout Italy, Austria and Germany it was becoming more familiar to take into account the atmosphere that each new station was generating in regards to its layout of public spaces. More and more of the stations serve not only to those who just pass through but also those who want to spend time there. It was clear that the station has now assumed and accepted more roles of significance for a cities growth and development. Still, the most profound moment of the trip was sitting on the platform, next to the tracks and seeing the people interact. The smell of the area the tone of voices and knowing your so far away from anything familiar make for an indispensable design prowess.

Along with the train experience, was being able to experience the urban space of Piazza Isolo and get first hand personal reading of its layout. The process here for this competition was to set up a photographic documentation and to also find some sort of possible design correspondence to its irregular shape. Through the incorporation of sectional elevations it was possible to derive more relevant issues of possible development. It was difficult to gain or find an area of inspiration on the site especially with the problem of traffic and parking. Down the curve of the piazza is the Adige River who the piazza owes its shape to. A few hundred years ago the piazza was the river. It was quite evident that here like the train tracks themselves the comparative dialogue of the piazza against the train started to make developments in the same conditions of how there was a defined edge condition. The buildings themselves in turn are interpreted as base relief objects set afloat on this once current of the river which was used as a transportation system itself at one point. The objective here is not to try and develop a portion of Venice here in Verona but to somehow adjust the historical significance of the river to be the new theme for development of the piazza.

To achieve this I built the base relief sectional pieces of the site itself to help enforce the desired theme of development. The sectional drawings cut through the site help identify major points of recognition and possible

readaptive uses of parking entry to below grade garage. More importantly than these built forms is the realization of the narrative of the train tracks with the river and how they can be used to establish generative themes and exploit new areas interaction when engaging public spaces.

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Field Validation of a Traffic Management Software

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Abstract

A recent development in computer-aided traffic management is the Transportation Emergency Management of Post-Incident Operations (TEMPO) Software, which was developed at the University of Texas at Arlington. The software estimates the origin-destination of the traffic on a roadway link which is scheduled to be closed. This estimate is then used to determine optimum detours around the closure.

Recently, Cooper Street, a major North-South arterial in Arlington, was reduced to one lane per direction between Mitchell Street and Park Row. The focus of this research is to validate the TEMPO model results with what actually occurred in the field, determine the best possible detours, and use TEMPO to predict actual driver route choice behavior associated with the closure of Cooper Street. To accomplish this the project will include conducting a literature review, collecting traffic data including traffic volumes, number of lanes and posted speed limits, building the roadway network on TEMPO, simulating the closure of Cooper Street, collecting actual field Origin/Destination data, and finally, statistically comparing the TEMPO computer simulation results to post-incident volume changes on the surrounding roadways in the field using a two sample t-test.

Introduction

America's roads are becoming more crowded every year. There are many different explanations which illustrate this phenomenon including an increase in vehicle registration, a decrease in the number of occupants per vehicle, growths in population and employment, an increase in suburbanization, and an increase in vehicle miles traveled. The aggregate effect of these factors is an increase in travel demand. The traditional response to increased roadway demand had been to simply build more or wider roads. Today, municipalities have neither the space nor the economic resources to do this. As a result, as more and more drivers compete for a finite amount of roadway space, travelers experience increasing amounts of delay due to congestion. Each year, delay due to congestion costs users approximately 2.21 billion gallons of wasted fuel, 2.02 billion vehicle hours lost, and \$15.9 billion in increased user costs (Lindley, 1989), not to mention the significant increase in driver frustration. These numbers are only expected to increase in future years.

Congestion can be classified as either recurring or non-recurring. Recurring congestion occurs when travel demand exceeds the daily freeway capacity, typically during peak user hours. Non-recurring congestion is the result of

some event which temporarily reduces freeway capacity, or alters the normal freeway operation. Non-recurring congestion occurs due to disabled vehicles, vehicle accidents, roadway maintenance, or special events; which are collectively referred to as incidents. Non-recurring congestion caused by incidents accounts for up to 60% of all urban freeway congestion in the 37 largest US urban areas (Garrison and Mannering, 1990).

The 1991 Intermodal Surface Transportation Efficiency Act ushered in a new strategy in congestion abatement. Gone are the days of building new freeways to accommodate increasing travel demand. Today's transportation officials focus more on increasing freeway efficiency and maximizing freeway's operating potential through the use of Intelligent Transportation Systems (ITS), Automated Highway Systems (AHS), Advanced Traffic Management Systems (ATMS), Automated Traveler Information Systems (ATIS) and other programs such as High Occupancy Vehicle (HOV) lanes, variable message signs, and incident management programs. Incident management programs include incident detection, incident mitigation, and incident response.

The focus of this report is incident mitigation. Once an incident is detected, it would be advantageous to be able to re-route the disrupted traffic to the best possible detour routes, thus circumventing the incident area and keeping the network's total traffic delay to a minimum. Doing this requires a means of knowing where the drivers are coming from and where they are going to; knowing their trips' origins-destinations. Recently developed is a PC and GIS based software program, known as TEMPO, which estimates the origin-destination matrix for a street network based on the network's traffic volumes. Once the origin-destination matrix has been estimated, it is possible to predict which route drivers will take given one of the streets along their usual travel route is closed due to an incident or maintenance.

Literature Review

Literature which discussed incident management appeared in the 1970's, but it was not until the 1980's that incident management research became more frequent. Perhaps this coincided with the technological improvements to computers that were needed to run the complicated algorithms, or maybe it was the rapid growth in congestion levels that prompted the growth in incident management research. Whatever the case may be, incident management is the focus of an abundance of current research.

Of the reports focusing on incident management, most only discuss what characteristics such an all inclusive program should include (Chang and Huarng, 1993) (Suttayamully et al, 1995) (Hobeika et al, 1993). Such research is important since it assists in defining the problem at hand and lays the foundation for

future research. Some literature focused on developing the algorithms to be used solely for incident detection (Stephanedes et al, 1992), while others went so far as to develop incident detection algorithms for specific uses such as on arterial streets (Ivan et al, 1995). This type of research is undoubtedly important to incident management, but it only addresses one part of the problem, and with the profusion of drivers with cellular phones, one has to wonder if the time and energy spent on developing incident detection algorithms would be better spent elsewhere.

One report coupled incident management and route diversion with signal re-timing along the detour routes, though the traffic was only diverted to the frontage roads with no consideration to other, more efficient routes. It was, however, conceded that better means of selecting the best possible diversion route(s) was needed (Campana 1996). Other incident management research discussed drivers' willingness to follow the traffic information/suggestions provided by variable message signs, radio announcements, or other sources (Khattak et al, 1992). No report found had developed a way to select optimal diversion routes. It seems logical that this part of incident management would seem to invaluable to an incident management program. A truly successful incident management program will incorporate all of the aforementioned components of incident management.

Tempo Description

TEMPO is a user-friendly menu-driven traffic management software designed to incorporate the versatility of windows, GIS approach and computer graphics. TEMPO was specifically designed for use in a post-incident environment due to major urban disasters or roadway incidents. TEMPO's capabilities include graphical editing, vehicle routing, traffic diversion and transit management. The program represents the roads and intersections through the use of two data files, a link file and a node file, respectively.

The node file contains three information fields to represent each intersection in the network. The fields include the node number used to identify each individual node, the X-coordinate; a real number representing the intersection longitude, and the Y-coordinate; a real number representing the intersection latitude. The link file contains the information necessary to adequately "describe" each roadway link. Each link is direction specific and connects two nodes. There are a total of ten fields for each link.

TEMPO's Modules

Network Editing Module

The network editing module in TEMPO is designed to allow graphical updating of the street network conditions based on incoming incident information. The Link Info/Edit function provides information on any street blockage in the network. The roadway link of interest is selected graphically by the use of a cursor. The subfunctions in the link info/edit function, include: 1) Edit that allows editing any of the information on the links selected; 2) Add and Delete functions allow additions of a new link to the network or deletion of selected link; and 3) Oppst. provides the information for the opposite direction of a two-way link. Once the network is edited, transportation operations, such as vehicle routing and traffic diversion, may be performed based on the latest roadway conditions.

Vehicle Routing Module

To perform vehicle routing, the origin and destination nodes are first selected by the use of a cursor. The user is then prompted to specify whether a time-based or distance-based shortest path is desired. Once the choice is made, the shortest path is instantaneously highlighted on the screen. TEMPO also outputs, upon request, a hard copy of the streets along the shortest paths specified. Therefore, any changes made in using the Network Edit module, such as closure of certain links or changes in link volumes, speeds, or capacities, will be taken into account. The algorithms in the Routing module also forms the basis for the Traffic Diversion module described below.

Traffic Diversion Module

The Diversion function allows the user to develop diversion strategies around closed roadway links. Upon activating the diversion function, the user is asked to define the boundaries of the region most likely to be affected by the closures.

The traffic diversion methodology incorporates a sequence of three major steps, namely,

- 1) Defining the affected region around the closure;
- 2) Origin-destination matrix estimation for the traffic on the closed links; and
- 3) Reassignment of the estimated O-D matrix traffic.

It is up to the user to decide exactly what constitutes the affected region. Through the use of the cursor, the user circumscribes the affected region by selecting a series of links that will form the affected region's boundary. It is important to note that the links selected as the boundary should be equal to or higher in classification as the blocked roadway. For example, an arterial should not be selected as one of the boundaries when a freeway link is being closed.

Defining this region alleviates the need for conducting involved calculations for a flow conservation, O-D matrix estimation and traffic assignment for the entire urban street network. Once the affected region is defined, all intersection nodes on the region's boundary are selected as "external" nodes. The external nodes are assumed to be the origins and destinations of the traffic on the blocked links, i.e. it is assumed that the traffic on closed links has originated only from an external node and is destined to an external node.

An O-D matrix is generally determined through the costly procedure of conducting O-D travel surveys in the study area. Alternatively, an O-D matrix can be estimated from the traffic counts on links within the study area (Refs. 1,4,14,18,19). The problem at hand is a sub-problem of the O-D matrix estimation from traffic counts. In the diversion problem, however, it is desired to estimate the most likely O-D table from the volumes on the closed links only. In the O-D estimation procedure used in TEMPO, all external nodes are considered as potential origins and destinations for the traffic on the closed links. Having closed any given link within the cordoned region, an O-D matrix associated with the volume served by that link is to be determined. To do so, a set of trip productions and attractions are defined for each external node. The productions and attractions at node i are defined as the total inbound and outbound volumes at node i , respectively.

The next step in the O-D estimation process is to determine the shortest path (according to time) between each external O-D pair. All such paths which utilize the now-closed links are noted. Assuming that the closed link belongs to the shortest path connecting a subset of i - j external nodes, the volume on the closed link is divided among the i - j pairs in proportion to the production at i and the attraction at j , as follows:

$$V_{ij}^k = (V^k)(P_i A_j / \sum_{ij} P_i A_j S_{ij}^k) \tag{1}$$

where

- V^k = the total volume on the link k to be closed
- V_{ij}^k = the proportion of V^k attributed to the trip exchange between external nodes i and j
- P_i = trip production at external node i

$$\begin{aligned}
 A_j &= \text{trip attraction at external node } j \\
 s_{ij}^k &= 1 \text{ if link } k \text{ is on the shortest path between } i \text{ and } j \\
 &= 0 \text{ otherwise}
 \end{aligned}$$

Note that,

$$V^k = \sum_{ij} S_{ij}^k V_{ij}^k \quad (2)$$

If more than one link is closed, the process is repeated for each closed link. In this manner, an overall O-D matrix is obtained as,

$$V_{ij} = \sum_k S_k V_{ij}^k \quad (3)$$

where V_{ij} is an estimate of the number of trips on the now closed links which originate from i and are destined to j .

In determining the shortest path based on travel time, the Davidson's links performance function (Davidson, 1996) has been used. The travel time on any link ij , t_{ij} , is estimated as a function of the peak period flow on link ij , q_{ij} , link capacity, C_{ij} , and the free flow travel time on link ij , t_{ij}^* , as follows:

$$t_{ij} = t_{ij}^* [1 + a(q_{ij} / C_{ij})]^3 \quad (4)$$

where a is a model parameter for which a value of 0.35 has been used (Taylor, 1977). The free flow travel time is estimated based on the link length and the free flow speed specified in the link file.

Field Validation/Calibration of Tempo

This study is based on using actual streets in the city of Arlington, Texas, and was conducted to coincide with the planned maintenance expansion of Cooper Street from Mitchell Street to Park Row. The area under analysis is located in central Arlington and in close proximity to the University of Texas at Arlington. There were no freeway sections included in the study area. The region is bound by Abram Street to the North, Arkansas Street to the South, Collins Street to the East, and Fielder Street to the West. Cooper Street is more or less located in the center of the region.

The street network of this area was constructed in the TEMPO program. The TEMPO street network was created with the aid of a MAPSCO Arlington Texas City Map. This was done so that the network's graphical representation of the streets in TEMPO would appear as close their actual arrangement as possible. Each street link has two directions, and each direction has ten char-

acteristics which define the link. The ten characteristics include the link's origin node, destination node, street name, direction (describing either a one-way street or a two-way street), link length, number of lanes per direction, free flow speed, number of parking lanes, capacity, and volume. To determine the number of lanes per direction, whether parking is allowed, the posted street speed limit, and the number of directions per link, each street circumscribed by the aforementioned boundary was driven and these characteristics were observed. So that information was collected accurately, and to avoid omitting necessary data, only one information field was gathered each time the area was driven. Later the streets were driven again to verify the collected information's accuracy. The free flow speed for each link was taken as the posted speed limit. Some additional links had to be constructed to reflect mid-block changes in the number of lanes per direction and/or a change in the posted speed limit. The link distances were directly measured from the MAPSCO Arlington Texas City Map. The link capacities are controlled by the efficiency of the origin and destination node intersections. The capacities were calculated according to the number of approach lanes and with respect to the total green time allocated to each link.

The link volumes were obtained from the City of Arlington and consisted of one-time, two way only traffic counts for a twenty-four hour period. The data given was not averaged and no adjustments or averages were made for seasonal, day of the week, or other trends. The TEMPO program requires traffic volumes which represent the P.M. peak hour volume. To transform the 24-hour two way traffic volume data into the peak hour values required for input into the link files, a 50-50 split was assumed since all arterials are located in the central part of Arlington, and a K factor of 12.5% was used. Urban k factors vary from 7% to 18%, the average of this span is 12.5% (Khisty, 1990). Below is a table containing the TEMPO volumes versus the field volumes.

TEMPO volumes versus observed field volumes

Org. Node	Dest. Node	Street Name	Tempo Vol.	Field Vol.
656	657	Mitchell	949	448
657	365	Davis	1133	1084
365	164	Park Row	1095	672
365	357	Davis	1036	696
357	950	Pioneer (303)	2306	1404
656	655	Mitchell	949	240
655	661	Pecan	934	384
661	164	Park Row	1435	816

Once all of the information was gathered and input into the TEMPO database, the lane closures due to the maintenance on Cooper Street were simulated in TEMPO. The output included a graphical representation of the diversion routes around the closure, and detailed information about each diverted link. This information includes the old link volume, the new link volume of the diversion links the new volume/capacity ratio, the old link travel time, the new link travel time. To check the accuracy of TEMPO's suggested diversion routes, diverted link volumes are compared to the actual link volumes in the field. The field volumes were obtained by counting the number of vehicles passing a fixed point on the diversion link. Each link of the diversion route was counted separately. The counts consisted of two fifteen minute periods. The greater count of the two was then multiplied by four to give the peak hour volume. There were two diversion routes predicted by TEMPO which included a total of eight links. After the link volumes were counted, all links along both diversion routes were driven again to recheck all link information and each link length was rechecked. After all relevant data had been collected and verified a statistical test was conducted to compare TEMPO's predicted volumes with the collected field volumes.

Test of Significance

A two sample t-test was used to determine if a statistical difference existed between the field volumes gathered after the maintenance on Cooper Street started and TEMPO's reassigned traffic volumes. The Behrens-Fisher two sample t-test was used as the procedure's statistical test. This t-test is used when testing two samples having different variances and where the number of data points is small.

The hypothesis was chosen to be:

$$H_0 : X_1 = X_2 ; \quad H_1 : X_1 \neq X_2 ; \quad \alpha = 0.1$$

The t value in the two sample t-test is calculates as:

$$Z_1 = (S_1)^2 / N_1 \tag{5}$$

$$Z_2 = (S_2)^2 / N_2 \tag{6}$$

$$t_{cal} = (X_1 - X_2) / (Z_1 + Z_2)^{0.5} \tag{7}$$

where:

X_1 = mean of the new volumes assigned by TEMPO

X_2 = mean of the actual field volumes

S_1 = standard deviation for TEMPO's new volumes

S_2 = standard deviation for actual field volumes

$N_1 = N_2 =$ number of links whose volumes were changed

If $-t_{cal} > t_{tabulated}$, then the reassigned volumes given by TEMPO are statistically different from the actual field volumes, for an assumed level of significance α , where the degrees of freedom, df , is given as,

$$df = (Z_1 + Z_2) / [(Z_1^2 / N_1 - 1) + (Z_2^2 / N_2 - 1)] \quad (8)$$

If $-t_{cal} > t_{tabulated}$, then the hypothesis that there is no significant difference between the TEMPO assigned volumes and the actual field volumes, the null hypothesis, is rejected. For this study, the significance level, α , was chosen to be 0.1.

In addition to the two sample t-test, a linear regression analysis was also conducted as an additional statistic test, designated as,

$$Y = a + bX$$

where:

Y = the volumes assigned by TEMPO

X = the observed field volumes

a = the regression intercept

b = the regression slope

To demonstrate there is no statistical difference between the volumes assigned by TEMPO and the field volumes, the regression intercept should be shown to be not statistically different from 0 and the regression slope should be shown to be not statistically different from 1. Thus the above equation would reduce to $Y = X$.

For the regression intercept, the hypothesis to be tested was:

$$H_0 : a = 0; \quad H_1 : a \neq 0; \quad \alpha = 0.1$$

The value of t_{cal} was calculated as follows:

$$t = (a - A) / S_a \quad (9)$$

$$S_a^2 = (1 / n) * (S X_i^2 / S (X_i - X)^2) * S_y^2 \quad (10)$$

$$S_y^2 = (1 / n-1) * S (Y_i - Y)^2 \quad (11)$$

where,

n = the number of links whose volumes were changed

X_i = the volume observed in the field

Y_i = the volume TEMPO assigned to the link

- S_y = the standard deviation around the regression line
- S_a = the standard deviation of the regression intercept
- Y = the mean of the TEMPO link volumes
- a = the Y intercept calculated by the linear regression
- $A = 0$, the null hypothesis is $a = 0$

The calculated t is compared with the t -value from the statistical table, using a degrees of freedom equal to $(n - 2)$ and $\alpha/2 = 0.05$. If $-t_{table} \leq t_{cal} \leq t_{table}$, H_0 can not be rejected. This means that the regression intercept is not significantly different from zero.

For the regression slope, the hypothesis was:

$$H_0 : b = 1; \quad H_1 : b \neq 1; \quad a = 0.1$$

The value of t_{cal} was calculated as:

$$t = (b - 1) / S_b \tag{12}$$

$$(S_b)^2 = (n / (n-2)) (S_c)^2 / S(X_1 - X)^2 \tag{13}$$

$$(S_c)^2 = (1 / n) S(Y_i - Y)^2 \tag{14}$$

where,

- n = the number of links whose volumes were changed
- X_1 = the actual field volume for each link
- Y_i = the volume TEMPO assigned to the link
- b = the estimated slope by the linear regression
- $b = 1$, the null hypothesis is $b = 1$.
- S_c = the standard error of residuals
- S_b = the standard deviation of the slope

Results

In comparing the mean of the link volumes predicted by TEMPO to the mean of the field volumes, the t_{cal} was calculated to be 2.402, the t value from the table was $t_{tab} = 1.397$, with a $df = 8.18$. This resulted in rejecting the $H_0 : X_1 = X_2$. This should be interpreted in there being a systematic overestimation of link volumes by TEMPO as compared to what is observed in the field.

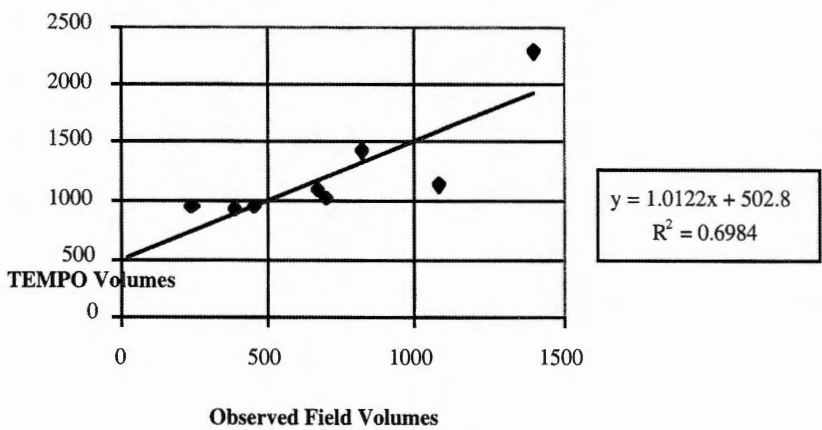
The linear regression intercept, a , was 502.9. The linear regression slope, b , was found to be 1.012. The t_{cal} computed for the regression slope was found to be 0.025, whereas the t value taken from the table provided a $t_{tab} = 1.943$. As a result, the null hypothesis, $H_0 : b = 1$, can not be rejected. The t_{cal} computed for the regression intercept was found to be 1.366 while the t value found in the

table gave a $t_{tab} = 1.943$. Again, the null hypothesis, $H_0 : a = 0$, can not be rejected. Below is the graph of the linear regression.

Discussion

As can be seen in the traffic volumes table, some of the link's field volumes are relatively close to those assigned by TEMPO, while others are very different. The null hypothesis which stated that the mean volumes were equal was rejected, but the null hypothesis for both regression analyses could not be rejected. There seems to be some inconsistencies between TEMPO's predictions and the field observations. There are several possible explanations that

TEMPO Volumes vs. Observed Field Volumes



might be useful in explaining these apparent inconsistencies when analyzing the test results.

The volume data that were obtained by the City of Arlington could have been the cause of some inconsistency. TEMPO estimates the O-D matrix from the traffic volumes initially input into each link file. In other words, TEMPO examines the traffic volume on the closed link and then tries to determine which O-D matrix would produce that link volume. If the volume data is inaccurate, the O-D matrix estimated by TEMPO will then also be inaccurate and thus any diverted traffic volumes might be inconsistent with what is actually occurring in the field. It would have been more appropriate to have used actual peak hour volumes instead of having to derive the peak hour volumes out of daily volume counts that could be highly unreliable. Unfortunately, there was no other agency which had any volume counts that were independent of

the City of Arlington's counts.

Another reason for the data inconsistencies is the possibility that TEMPO's algorithm needs to be calibrated to better reflect what is in fact going on in the field. Also, TEMPO assumes that drivers will be behaving optimally. For the incremental re-assignment of the closed link volume, deterministic user equilibrium has been used according to the Wardrop's first principle. The validity of the deterministic user equilibrium procedure is sometimes questionable since it assumes that all drivers have a perfect knowledge of the travel time on each link. Driver behavior is one of the most difficult aspects to model since the human thought process is very complex. Drivers do not always select the route with the shortest travel time, whether through lack of knowledge of actual travel times or other travel characteristics and route choice criteria that the driver finds to be more important. Given the results of the statistical tests, it seems unlikely that TEMPO's algorithms and assumptions concerning driver behavior would be the cause for the test result's inconsistencies. Perhaps if better data were available, the results would be more consistent.

If the data inconsistencies mentioned above are worked out, TEMPO has a number of very promising application possibilities. A promising potential application of TEMPO and its heuristic diversion algorithm are in the area of Intelligent Transportation Systems (ITS). As a component of an Intelligent Transportation System, TEMPO can be used to inform motorists, through the use of variable message signs, of incidents and which diversion route to use to avoid these incidents. TEMPO can be used to determine the best possible detour routes as a result of any scheduled maintenance. It can provide the anticipated traffic volumes along the diversion routes so that the traffic signal timing can be adjusted to accommodate the increased traffic. TEMPO could also ascertain the impact on travel delay when closing a street for maintenance. TEMPO can be useful to access the impact of different transportation planning strategies such as converting an aggregate of two-way streets into one-way streets, or the impact of converting a street into a pedestrian mall in an entertainment district. TEMPO could also be used in transportation planning to access what impact adding a new link will have on the rest of the street network. TEMPO could be instrumental in alerting emergency response vehicles, such as fire trucks, ambulances, or police patrols, as to the shortest route to any destination in the network, and thus reducing response time. TEMPO could be used, in the event of a natural disaster, to inform motorists which routes are still usable and estimate the expected traffic volumes and travel times along these routes. Due to its graphical interface, GIS-type database and high execution speed, TEMPO and its algorithms may have potential applications in the areas of Advanced Traffic Management Systems (ATMS), Advanced Traveler Informa-

tion Systems (ATIS), and Electronic Route Guidance Systems, among other proposed and planned transportation innovations.

Summary

A recent development in computer-aided traffic management is the Transportation Emergency Management of Post-Incident Operations (TEMPO) Software. TEMPO is a user-friendly menu-driven traffic management software designed to incorporate the versatility of windows, GIS approach and computer graphics. The software estimates the origin-destination of the traffic on a roadway link which is scheduled to be closed based on the traffic volumes found on the traffic network. This estimate is then used to determine optimum detours around the closure, and also provides the information necessary to adjust the traffic signal timing accordingly. Other applications of TEMPO include its use as a transportation planning tool, incident management, or the ability to provide the shortest route to any destination in the network; making it a very versatile and useful tool. Virtually every Intelligent Transportation System application, though, requires large amounts of basic transportation information; such as peak hour traffic volumes and average annual daily traffic. If advances in transportation are envisioned, it is up to the municipalities to conduct the proper data collecting activities that will satisfy the large data requirements needed to accommodate ITS applications.

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Rates of Root Zone Oxygen Transfer into Aqueous Solution by an Emergent Macrophyte

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Abstract

The purpose of this research was to determine mass flux rates and $K_L a$, the gas mass transfer coefficient, for net oxygen transferred into the rhizosphere and water surrounding wetland plants by an emergent macrophyte, *Eleocharis quadrangulata* (a spike rush). It was hypothesized that the diffusion of oxygen from the roots could be modeled using the two-film theory of gas transport. Determination of oxygen flux and $K_L a$ were accomplished with a non-steady state batch reactor that limited gas transfer except through the roots of the plant into a deoxygenated solution, as measured by a dissolved oxygen probe.

Introduction

With wastewater treatment needs of all types growing, water quality requirements becoming more stringent, and awareness of environmental issues increasing, research of natural treatment systems for treating wastewater has accelerated. One area of concentrated interest has been constructed wetlands. Constructed wetlands are not governed by the same legal constraints for the discharge of treated wastewater effluent as natural wetlands, and the physical parameters for treatment can be controlled better. They can provide an economical, low-tech, environmentally friendly alternative to treat wastewater.

Wetlands can be defined as land areas that are flooded or saturated by water for long enough periods of time to produce anaerobic conditions in the soil, to the extent that plant growth is limited to aquatic plants¹³. These plants can be floating, submerged, or emergent. Constructed wetlands often utilize emergent species such as the common reed (*Phragmites australis*), cattail (*Typha latifolia*), and bulrush (*Scirpus lacustris*), which are rooted in the sediment and grow through the water layer to emerge into the air. Constructed wetlands can further be described as free surface flow or subsurface flow systems. Free surface flow wetlands consist of water freely flowing over the surface of the substrate, which is usually soil. Subsurface flow wetlands usually have gravel or sand as the substrate, and the water surface is below the top of the substrate layer.

Oxygen is transferred into the water through the air-water interface and by the plants. Since the water flows through the substrate in a subsurface flow system, where the plants are rooted, oxygen that the plants transfer into the system could be available to help treat the waste. In the available literature,

there is a divergence of opinion about how much of the oxygen is transferred by the plants compared to that crossing the air-water interface. The quantification of dissolved oxygen input by aquatic plants and conclusions drawn therefrom are quite varied. Oxygen is required by many of the microorganisms that provide biological treatment of wastewater. Some researchers have remarked that the oxygen transfer by the plants to the root zone is important for the microbial populations to function effectively.^{21,32,34} Others have said that oxygenation of the system by plant roots is so limited as to be only of value to the plant itself, to support respiration and as protection against the anoxic conditions present in the root zone of a wetland.^{1,5,10,11,24,30}

Several different experimental arrangements have been used. Measurements of dissolved oxygen flux from the roots of emergent macrophytes have been made with microsensors (to determine radial oxygen loss from roots), probes that measure oxidation-reduction (redox) potential, and dissolved oxygen (DO) probes. The first two methods have been used more to determine the dissolved oxygen levels to be found at very small distances from the plant; the third has been used to measure DO levels for the system. Rates of plant oxygen input have also been inferred from nitrogen mass balances, BOD reduction, and carbon mass balances.²⁴

Gas transfer in emergent macrophytes has been determined to be the result of humidity-, thermally-, and/or Venturi-induced convective flow, as well as diffusion. The plant is able to create a pressurized flow as a result of a difference in humidity or temperature from the air around it. Mass flows of gases such as oxygen, carbon dioxide and methane are driven by convective flow through the rhizomes and shoots along partial pressure gradients. Venturi-induced flow occurs when wind blows across broken or dead shoots, forcing air in some and out of others. Gas exchange occurs through the roots by diffusion. Diffusion is the process whereby the molecules move from a region of high concentration to one of low concentration, and it occurs when a pressure or concentration gradient exists. Changes in humidity and temperature result in significant variations in pressurized flow rates in emergent species over the course of the day and night, from day to day, and seasonally. Although photosynthesis does not seem to enhance the concentration of oxygen in the shoots, sunlight can cause convection to increase because light amplifies the degree of stomatal openings in the leaves, and higher temperatures cause steeper diffusion gradients for gases.¹ A large proportion of the oxygen entering the plant is vented to the atmosphere instead of being used in plant respiration or efflux to the root zone.¹ It has been observed that emergent plants have influx and efflux shoots, and these functions may sometimes be reversed, depending upon certain conditions.³⁷

It was hypothesized in this study that the diffusion of oxygen from the

roots could be modeled using the two-film theory of gas transport. The two-film model is the simplest and most widely used model of gas transport, and it has illustrated experimental data from aeration studies well. The purpose of this research was to determine mass flux rates and $K_L a$, the overall mass transfer coefficient from the two-film model, for oxygen transferred into the rhizosphere and water surrounding wetland plants by one or more species of emergent macrophytes.

In the two-film model, it is assumed that the two fluids are well-mixed, at steady state, with laminar flow³². At the air-water interface, the two bulk fluids experience an instantaneous thermal and pressure equilibrium, with a thin transition layer just next to the interface for each fluid. The driving force behind the transfer of mass from one phase to another (flux) is the tendency of the system to go to equilibrium.³⁹ Fick's law of diffusion describes diffusive flux as a function of the gradient multiplied by a proportionality constant, at constant temperature³⁶:

$$\frac{dC}{dt} = K_L a (C_s - C)$$

where

- dC/dt = the rate of change of concentration of gas in the solution
- $K_L a$ = the overall mass transfer coefficient
- C_s = the saturation concentration of the gas in solution
- C = the actual concentration of the gas in solution

The proportionality constant, $K_L a$, is a function of temperature, the intensity of mixing, the geometry of the chamber, the type of aeration, and constituents in the water²⁷. It is determined experimentally for each system. This model was developed for bubble aeration and is used in most aeration studies to characterize oxygen transfer³².

The oxygen mass transfer rate is often determined by a dynamic method where the dissolved oxygen concentration in the water is measured as a function of time after a regular input (in this case, the continual addition of oxygen from the plant). The initially oxygen-free water is gradually reaerated in a batch reactor until saturation is achieved. In a batch reactor, there is no inflow or outflow, so the accumulation rate is equal to the generation rate. To measure the oxygen concentration, polarographic oxygen electrodes (such as a DO probe) are used. If the system is assumed to be well-mixed, and the influence of probe lag is neglected, the mass transfer coefficient can be determined from the probe response curve²⁶.

Materials and Methods

Plans for experimental studies were revised after initial testing. Originally, comparisons were to be made between several large species, for variations in diurnal conditions, in de-oxygenated, oxygen-saturated, and reducing conditions, and of single vs. multiple plants. The decision was made to test one smaller species, *Eleocharis quadrangulata*, using de-oxygenated conditions, due to equipment and time constraints. Since there is consensus in the literature that convective flow is greatest in the plant during daylight hours due to light, heat, and lower ambient moisture content, the tests were conducted only during the day. Multiple plants were used for all tests to achieve measurable changes in oxygen concentration.

Container-grown specimens of *Eleocharis quadrangulata*, *Eleocharis macrostachya*, and *Scirpus validus* were provided by the Lewisville Aquatic Ecological Research Facility. The plants were transported to UTA and placed in full sun in a small plastic pool, filled to overflowing. On the first day, a general plant fertilizer solution with 15-30-15 of NPK was added to the water. Water was added daily to replace that lost through evaporation/transpiration.

Eleocharis macrostachya proved too delicate and *Scirpus* too large for the experimental setup, and time constraints prevented the construction of an alternate arrangement. Four *Eleocharis quadrangulata* plants of average size were used for each experimental run. The average shoot length for *Eleocharis quadrangulata* used for these tests was 39 cm from the root/shoot junction, and the plants grow in clusters of 4-8 shoots. Wide-mouthed glass 3.785-L jars with metal lids served as non-steady state batch reactors. Nitrogen gas was used to de-oxygenate the water. The jar containing nitrogen-sparged tapwater was sealed with Handi-Tak adhesive putty and yellow gas line PTFE tape to prevent gas transfer from the ambient space, so that the plants would be the only source of oxygen. Tapwater was used because of its near-neutral pH and convenience. Sediment was washed away from the roots, and the plants were allowed to sit in 3% sodium hypochlorite solution for one minute to kill microorganisms on the roots and rhizomes. The plants were rinsed again and allowed to soak in clean tapwater for several minutes before being positioned in the hole of a stopper in the lid of the jar. A Yellow Springs 5739 dissolved oxygen field probe was placed through another hole in the stopper with the plants. The probe and the YSI Model 58 DO Meter were calibrated with water-saturated air before each test, and membranes were checked frequently and replaced as needed. The area around the hole in the lid was sealed with Handi-Tak nontoxic adhesive putty. A magnetic stirrer and stirbar were used to keep the solution well-mixed. Since the reactor/plant setup was placed in direct full sun, with maximum ambient temperatures of 32-38°C, the jars were placed in

a foam-insulated water bath, constructed from a foam cooler with tapwater continuously flowing through it. The water level was approximately 8 cm below the top of the lid.

Results and Discussion

Oxygen Flux

Average oxygen fluxes into the reactor were determined by calculating the change in concentration (mg/L/hr) over the duration of the test run. Data from experiments run without plants (Table 1) indicate a range of average oxygen flux of 0 - 0.098 mg/L/hr. This is probably due to unseen air leaks into the reactor. Typical data of oxygen concentration versus time are shown in Figure 1. The average oxygen fluxes during the tests with plants are shown in Table 2.

Table 1: Experimental Control Flux Summary

Date	Total Change (mg/L)	Time (hr)	Average Flux (mg/L/hr)
July 19	-0.06	3.83	0.000
July 22	0.76	7.75	0.098
July 23	0.11	10.33	0.011
July 24	0.21	4.00	0.053

Table 2: Eleocharis quadrangulata Flux Summary

Date	Total Change (mg/L)	Time (hr)	Average Flux (mg/L/hr)
July 16	0.52	5.33	0.098
July 17	1.28	7.75	0.165
July 18	0.76	7.75	0.098
July 19	0.73	8.75	0.083
July 22	1.36	7.78	0.175
July 23	0.55	10.17	0.054
July 24	0.30	7.17	0.042

July 17: Raw Data

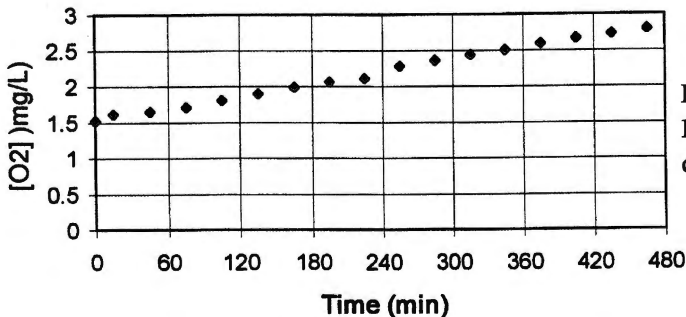


Figure 1: Raw Data, Eleocharis quadrangulata

The average flux rates of the plants were highly variable, ranging from 0.042 - 0.175 mg/L/hr. This could partly be explained by differences in root/shoot mass between sets of plants, overall plant health, and the possibility of unknown leaks in the setup. Considering the flux range of the controls, expected DO probe accuracy of ± 0.03 mg/L, the influx rates of the experiments with plants could be as low as 0 - 0.045 mg/L/hr. If a subsurface flow depth of 60 cm is assumed based on an average root length of 30 cm²⁴, the flux range is 0 - 0.32 g O₂/m²/d for a 14-hr day. According to Kadlec and Knight²⁴, the range of values reported by other workers is 0 - 28.6 g O₂/m²/d. Rates of 0 - 3 g O₂/m²/d were found by 15 of the 23 studies reported. The oxygen flux rates determined herein correlate with those low rates.

Determinations of K_La

Two of the seven experimental runs with plants came to an apparent equilibrium, July 16 and July 23. The C_s values were 5.00 and 5.23, respectively. Since the test on July 23 was a continuation with the same plant used July 22, the C_s value from July 22 was used for July 23. It was expected that there would be a range of C_s values, specific to each set of plants in an experimental run. Since only two of the runs came to equilibrium, a C_s value had to be assumed for the other five. These are shown in Table 3, along with the K_La values.

Table 3: Eleocharis quadrangulata K_La Summary

Date	C _s (mg/L)	K _L a (min ⁻¹)
July 16	5.00	1.26E-02
July 17	5.00	9.54E-04
July 18	5.00	1.57E-03
July 19	5.00	1.31E-03
July 22	5.23	1.46E-03
July 23	5.23	4.91E-03
July 24	5.00	5.28E-04

To ascertain K_La, values of $-\ln((C_s - C_t)/(C_s - C_0))$ were plotted versus time in minutes, and a best-fit line was drawn through the points using linear regression. The slope of the line was measured to determine K_La for each experimental run. Figure 2 shows a typical plot and curve. The R² values for the curves were high, above 0.916 for all tests except July 24, which had an R² of 0.762.

Brix⁸ found the internal oxygen concentration in the deepest rhizomes of

Phragmites australis to be 3.6%, compared to 21% in the aerial stems. The C_s values observed here were much higher than expected.

July 17: *Eleocharis quadrangulata*

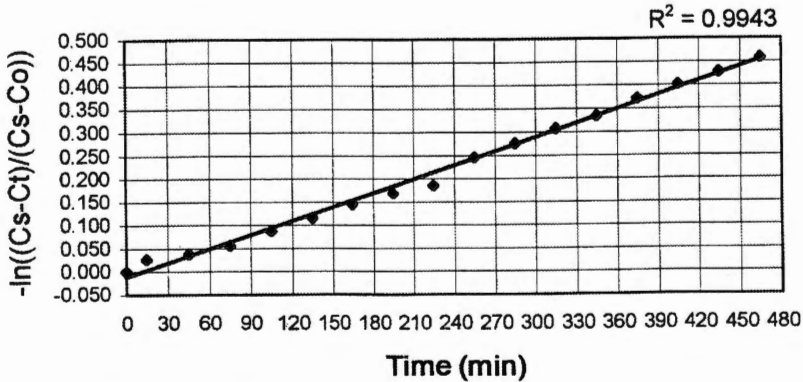


Figure 2: July 17 $K_L a$ Graph

Conclusions

More data need to be collected to be confident of the results of this study. The two-film model fit the data very well, according to the R^2 values. Although $K_L a$ was generated from the data, the usefulness of those values is unknown. Calculated values from these experiments would have limited value in a real system. Gas transport between roots is possible. The complete mixing during these experiments probably caused a dynamic equilibrium of maximum oxygen concentration as some oxygen was transferred into the lower roots while the plant continued to pump oxygen into the rhizomes. Relatively low oxygen concentrations in wastewater would create an oxygen concentration gradient, but the rate of diffusion could be different in different root zones. In a real system, the water is not mixed completely, and different C_s values may be found in different parts of the root system, so the model of gas transport using a single value of $K_L a$ would not apply.

The plants seemed to deteriorate over time in the wading pool. The deterioration of plants used two days in a row in the reactor was noticeable on the morning of the second day and marked by the end of the second day. On July 24, brown tips were seen on all shoots, and the ability of the plants to pressurize and create convective flow to the rhizomes may have been compromised.

This experimental method could be refined further, and using a reducing solution instead of de-oxygenated solution may simulate the typically anoxic

conditions found in the root zone of wetland plants.

Acknowledgements

Appreciation is extended to the UTA Civil Engineering Department, the Lewisville Aquatic Ecology Research Facility, and the McNair Scholars Program of UTA for their assistance and support during this project. Special thanks go to Dr. Andrew Kruzic for his guidance, encouragement, and support as faculty mentor.

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Nonuniform waveguide-grating couplers for illumination devices

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Abstract

Waveguide-grating (WGG) couplers with non-uniform grating profiles may be used in illumination systems for photonically controlled silicon antennas. These optical devices utilize diffraction gratings to uniformly couple light out of a waveguide. Device coupling efficiency is a function of the diffraction grating groove depth and the waveguide layer thickness. Conventional optical WGG devices are constructed with uniform grating groove-depth profiles whereby the output light intensity decays exponentially over the length of the grating. In order to obtain a uniform output light intensity, theoretical studies using approximate models indicate that a non-uniform grating groove depth variation with a hyperbolic profile is needed. This yields a spatially-varying diffraction efficiency that compensates for the loss of light as it is diffracted out of the waveguide. Constant output light power is achieved by increasing the grating diffraction efficiency along the length of the WGG coupler. Utilizing a holographic interferometer and a computer controlled shutter, sub-micron period gratings with nonuniform spatial profiles are recorded in photoresist and transferred to produce photopolymer WGG couplers.

1. Introduction

Photonically switchable microwave antennas are formed by photoexcitation of electrons in silicon. Silicon is made conductive by illumination with an intense infrared light source. Once the silicon becomes excited, its behavior resembles that of a conductive metal, and a photonic antenna can be formed. The antenna shape, size and contour is defined exclusively by the illuminating light pattern. Proposed photonic antenna illumination devices constructed in the University of Texas at Arlington's Electro-Optics Research Center include optical waveguide grating (WGG) structures. These devices couple light out uniformly from a planar waveguide through a non-uniform profile, sub-micron, surface-relief grating, thus producing a single-order normally propagating wave. The grating structures are produced to provide a uniform illumination over a 20 mm x 20 mm area. Simple shapes such as a bow-tie structure have been fabricated such that the grating region is formed on the slab waveguide to couple light out in the appropriate triangular pattern (Fig. 1).

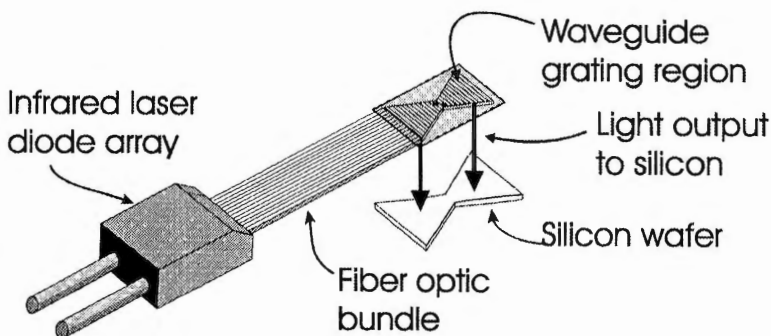


Figure 1. Photonic antenna illumination system utilizing nonuniform waveguide grating coupler.

As fully illuminated bow-tie antennas require a significant amount of optical power, there interest in exploring sparsely illuminated bow-tie photonic antennas to conserve power and reduce the heat load. Furthermore, antennas of complex shape (such as log-periodic ones) are of practical interest. A bow-tie shaped antenna is illustrated in Fig. 2 by using narrow WGG segments.

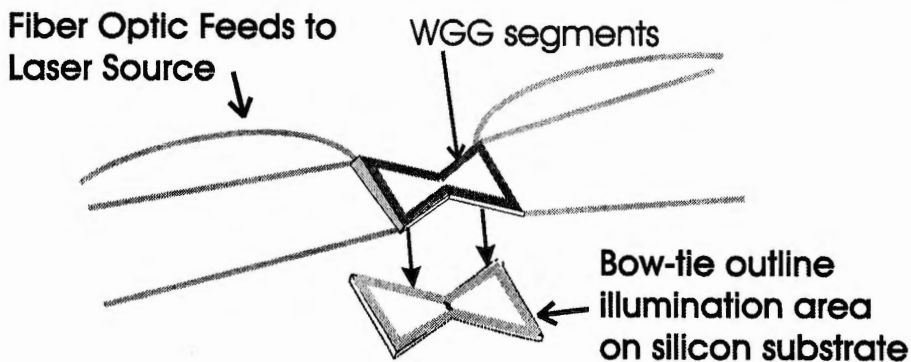


Figure 2. Photonic antenna illumination system using optical waveguide grating segments.

Uniform, high-power illumination is a primary requirement for a photonic antenna illumination system. Commonly, optical waveguide gratings are constructed with uniform grating profiles. With a uniform WGG structure, the output intensity decays exponentially over the length of the grating (Fig. 3). In order to obtain a uniform output light intensity, simple theory utilizing ap-

proximate models [1] indicate a non-uniform grating with a hyperbolic profile is needed. Constant output light power can be achieved by increasing the grating diffraction efficiency along the length of the WGG coupler.

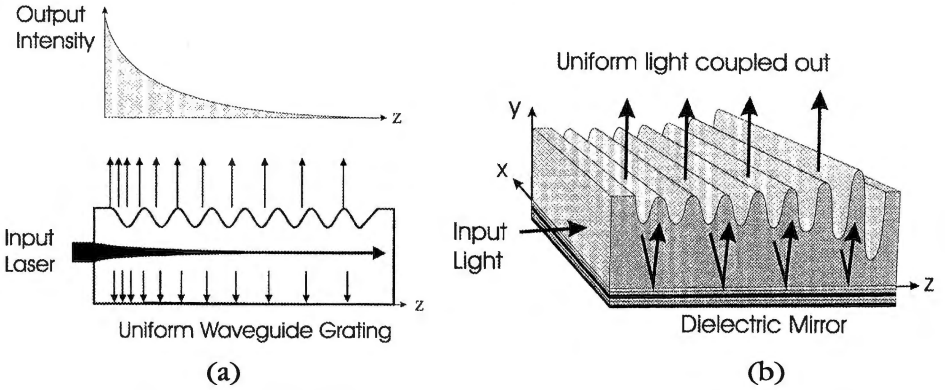


Figure 3. (a) Uniform grating profile produces exponentially decaying light output intensity, (b) Increasing grating strength along coupler length produces uniform output illumination.

2. Design Approach

Uniform intensity output for a photonic antenna illumination system requires that the illuminating source emit the light in a direction that is perpendicular to the WGG element surface. Single-order diffracted output light can be obtained with a surface-relief type WGG structure by fabricating the device with the correct grating period for the input laser source. Referring to Fig. 4, the correct grating period is calculated using [2,3] the equation

$$\frac{1}{\lambda_g} + \frac{n_1}{\lambda} \bullet \cos\theta = \frac{l}{\Lambda} \quad (1)$$

where λ_g is the mode wavelength in the guide ($\lambda_g = \lambda/n_{eff}$), λ is the freespace wavelength, l is the diffracted order, and Λ is the grating period. For single order, normal output from a multi-mode waveguide ($l=1$ and $\theta=90$ degrees), equation (1) reduces to

$$\Lambda = \frac{\lambda}{n_{eff}} \quad (2)$$

Using equation (2) above, a grating period of 520 nm is required for $\lambda = 810$ nm and $n_{\text{eff}} = 1.55$.

Since light will be coupled out of the waveguide grating both above and below the grating, a dielectric mirror is placed below the waveguide to redirect the parasitic wave and increase the light output intensity toward the silicon antenna element.

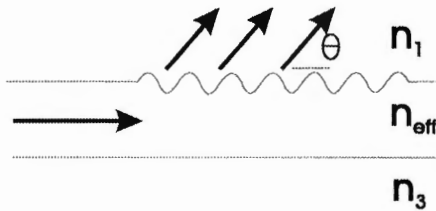


Figure 4. Illustration for designing a WGG coupler to obtain single order, normal output.

3. Fabrication

3.1 Fabrication of photoresist grating

Fabrication of the WGG coupler device begins by recording a non-uniform, surface relief photoresist grating on a ruby-lith substrate. Ruby-lith is a clear plastic sheet that has a layer of red, UV absorbing plastic film on one side. Prior to recording, the ruby-lith substrate is coated with an even layer of positive photoresist, which is photosensitive to UV light. Using the single beam interference setup depicted in Fig. 5, the photoresist-coated substrate is exposed in the UV stationary interference pattern to record a grating. The recorded grating period is calculated by,

$$\Lambda = \lambda / 2 \sin \alpha \quad (3)$$

where λ is the freespace wavelength, Λ is the grating period and α is defined in Fig. 6.

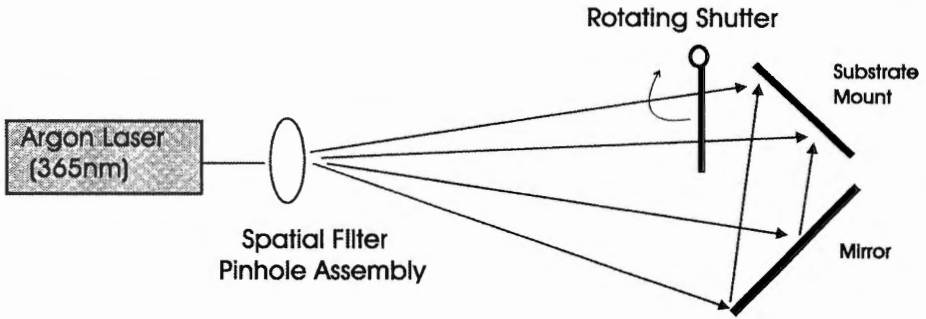


Figure 5. Single beam UV laser interference schematic to record grating pattern.

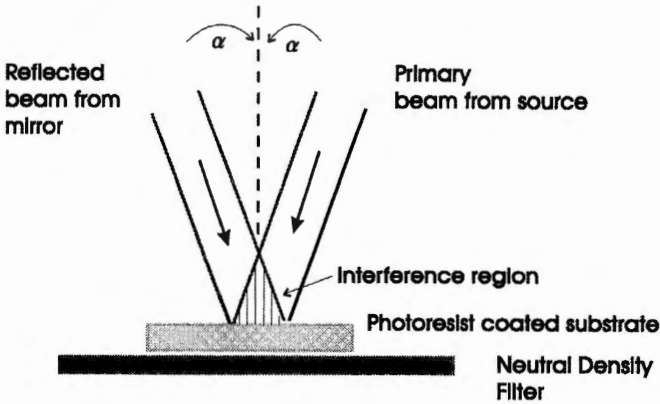


Figure 6. Recording setup at substrate for fabrication of photoresist grating.

The groove depth of the recorded photoresist grating is a function of both exposure time and development time, thus a nonuniform grating can be recorded by varying either of these parameters. In this paper, a nonuniform exposure rate is implemented by imposing a rotational shutter in front of the photoresist coated substrate. The rotating actuator speed is precisely controlled through the computer program LabView. After exposure and development of the structure using developer, the result is a non-uniform grating recorded in photoresist. In order to successfully record this type of grating, the beam ratio of the primary and reflected beams must be of equal intensity at the sample in the interference setup. A neutral density filter is used as a substrate mount to reduce spatial noise recorded in the photoresist, which is caused by back reflections from the substrate. Since these gratings are recorded using a holographic interferometer, the cross-sectional profile of the grating is sinusoidal in

nature. However, a hyperbolic variation in the sinusoid amplitude peaks (groove depth) is induced by the nonuniform exposure rate across the substrate. Optimization of total exposure and development times to obtain the most efficient non-uniform grating structure is accomplished by experimental iterations. Geometrical grating shapes such as the triangular bow-tie can be fabricated by selectively exposing the photoresist substrate using a UV absorbing mask.

3.2 Fabrication of waveguide grating

The WGG substrate is a clean glass microscope slide that can be prepared by coating with an even layer of Summers Optical Milbond Separation film, if removal of the fabricated WGG segment from the substrate is desired. This film allows the final cured device to be easily removed from the glass substrate by immersing in warm water for several seconds. The waveguide grating structure is fabricated using an optically clear, colorless liquid photopolymer that will cure when exposed to UV light. Curing times vary depending upon the intensity of the UV light source. The polymer in its cured state has an index of refraction of approximately 1.55. Using a printing technique, the prepared photoresist grating is transferred to the polymer waveguide. The input coupling optical fiber(s) are directly cured in the waveguide grating structure, minimizing coupling losses for the device.

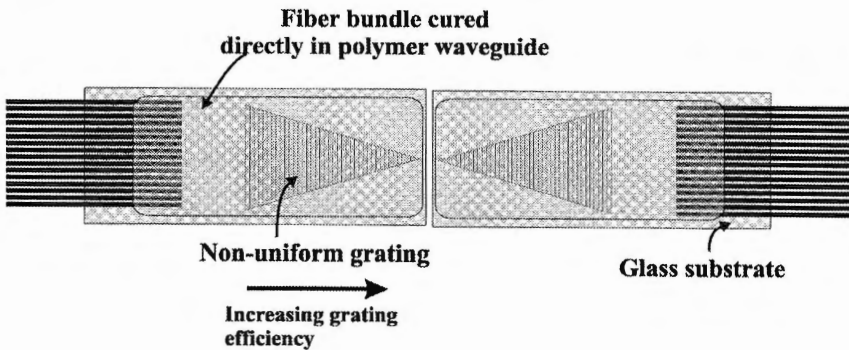


Figure 7. Two triangular waveguide-grating devices form a bow-tie illumination device (each triangle approximately 20 mm x 25 mm) fabricated using UV curable photopolymer.

Sparsely defined antennas, where only the antenna outline is illuminated, require considerably less optical power than fully illuminated bow-tie antenna elements. By utilizing narrow segment WGG couplers in a sparse antenna system, generated heat load can be reduced and the overall coupler efficiency

can be increased compared to a full planar WGG system. In a full planar WGG coupler, the illumination light pattern is defined by the grating region (Fig. 7). Since the grating region does not extend across the entire waveguide, this results in a significant amount of lost undiffracted transmitted power. Utilizing narrow WGG segments to define the illumination pattern confines the optical power to the grating region, resulting in higher coupler efficiencies.

3.2.1 Direct laser curing technique [4]

Narrow WGG segments are fabricated by selectively curing strips in the uncured polymer waveguide. A narrow WGG segment can be formed in the prepared substrate by selectively curing a strip with an unfocused 365 nm Argon laser beam. Using the setup depicted in Fig. 8, a WGG strip can be cured by scanning the unfocused laser beam across the substrate with a rotating mirror. The mirror is mounted on a rotating actuator that is connected to a programmable controller.

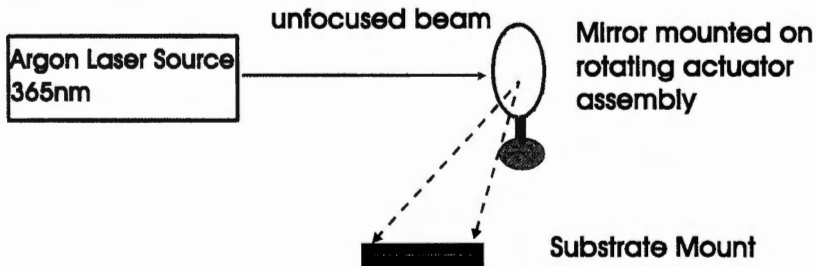


Figure 8. Direct laser curing setup using an unfocused Argon laser beam that scans across a prepared substrate.

The optimal laser scanning speed depends on the polymer layer thickness used in the prepared substrate. For a thickness layer of approximately 100 μ m, a scanning speed of 0.05 degrees per second is needed for a beam spot size of \sim 1.6 mm with 0.5 W output power. Using this technique, a 20 mm long, 1.6 mm wide narrow strip can be cured in the photopolymer. The strip is developed by rinsing the uncured photopolymer away with acetone. Acetone washes away the unexposed polymer, but does not react with the cured material, thus leaving a ridge type waveguide grating segment (Fig. 9).

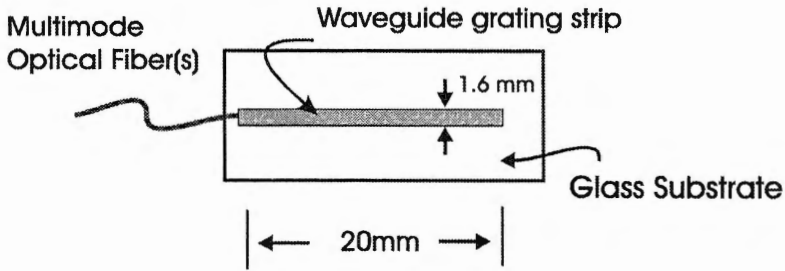


Figure 9. Narrow waveguide grating segments fabricated in photopolymer strips.

If a layer of separation film is used, the WGG structure is easily removed from the glass slide substrate. The beam used to cure the WGG strip is Gaussian in its intensity profile; therefore, the ridge-type waveguide cross section is not a perfect rectangle but is influenced by the Gaussian nature of the intensity distribution.

3.2.2 Masking technique

Fabrication of the WGG segments can also be implemented using a masking technique. By covering the substrate with a UV-absorbing ruby lith mask, narrow grating strips can be cured into the photopolymer using a UV light source, Fig. 10. The ruby-lith mask is created by removing a narrow strip of the red UV-absorbing plastic film from a piece of ruby-lith plastic. This allows UV light to pass through the clear plastic strip (where the red absorbing film is removed) and blocks the remaining UV light. The clear plastic from the ruby-lith material does absorb the UV light in a limited amount (~15%) and while it is optically clear, imperfections in the plastic (such as scratches) can cause scattering. The masking technique works best when an intense UV curing source is used. When a low intensity UV lamp is used, a longer exposure time (approximately 1 hour) is needed and the cured strip is not well defined. When curing the masked structure in a uniform part of the diverging 365 nm Argon laser beam (curing times reduce to ~5 minutes) a sharp rectangular WGG can be formed. Development of the WGG strip follows the same procedure described above for the direct laser technique.

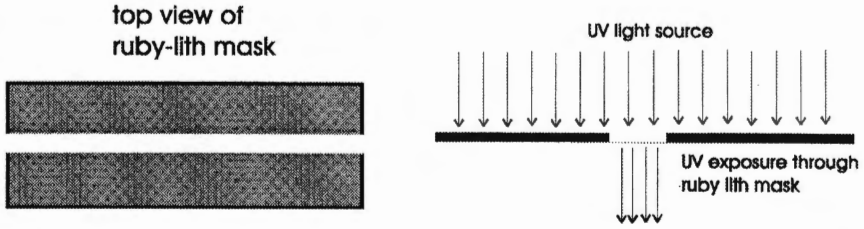


Figure 10. Fabrication of narrow waveguide grating strips utilizing a ruby-lith mask.

4. Testing/Results

The output coupling efficiencies of the WGG strips are evaluated by coupling the appropriate wavelength into the structure and measuring the output light pattern with a power meter. The power meter detector head is connected to a fiber optic bundle that is used to scan the narrow WGG segments. The testing setup is depicted in Fig. 11 with the fiber bundle tip placed as close as possible to the WGG strip surface to obtain the most accurate output measurement. A programmable controller operates a linear actuator which scans the optical pickup over the grating strip. The scanning results are simultaneously stored on a computer that operates the program LabView such that the efficiency measurement can be graphically displayed.

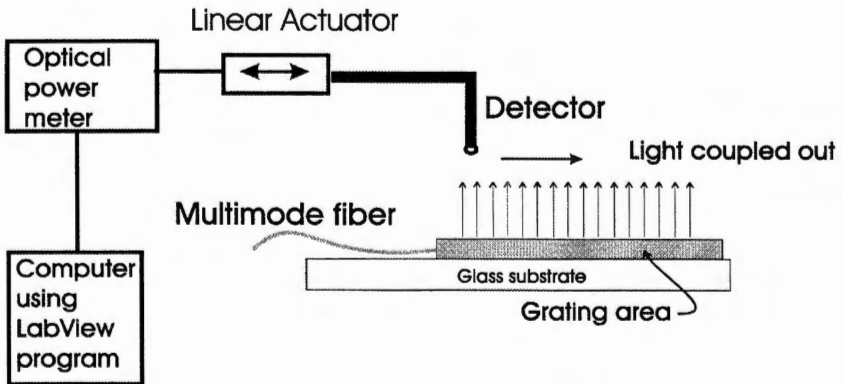


Figure 11. Testing setup with a side view of the WGG segment.

The measured results reported in this paper were obtained with HeNe laser. A WGG of approximately 1.5 mm x 20 mm with a $0.45\mu\text{m}$ period and a non-uniform profile segment was fabricated using the masking technique and

was tested by coupling 633 nm light into the structure. The scanning results are shown in Fig. 12. In addition, a scanning electron microscope picture depicting the sinusoidal cross sectional profile of a 1 μm period photoresist grating is included in Fig. 13.

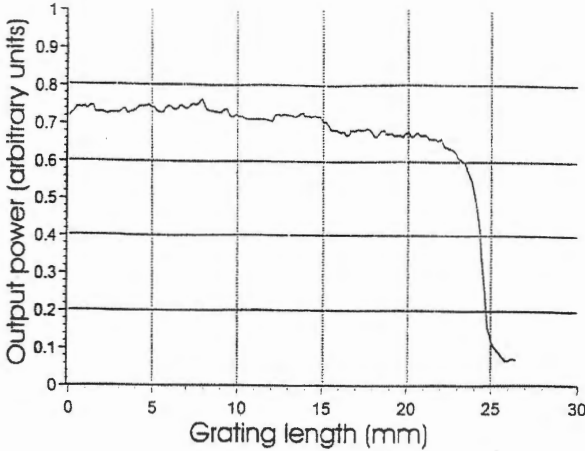


Figure 12. Outcoupled power distribution for a non-uniform 0.45 μm narrow WGG strip (1.5 mm x 20 mm) using the masking technique of fabrication.

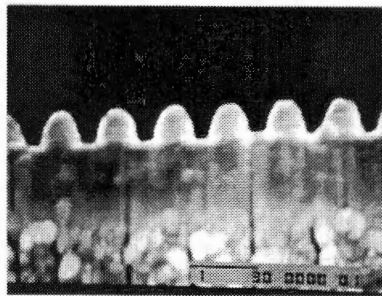


Figure 13. Scanning electron microscope picture of 1 μm period photoresist grating.

5. Conclusions

An illumination device to form broadband photonic antennas of complex configuration has been described. Fabrication techniques for forming full planar WGG couplers and narrow, straight WGG segments have been detailed utilizing photopolymer compounds. Uniformity measurements of the outcoupled light was within $\pm 6\%$ over the entire waveguide grating structure,

with diffraction efficiencies exceeding 50%. Several ways to improve on these illumination devices include depositing a low-index layer (such as MgF_2) on the substrate to enhance the light confinement of the photopolymer waveguide layer, increasing overall device efficiency. In addition, further optimization of the grating profile and light uniformity is needed in order to obtain the required high-power, uniform output illumination.

The author would like to thank Z. S. Liu, P. P. Young and R. Magnusson for their full collaboration and support on this project.

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Maximizing the Benefits of Parallel Search Using Machine Learning

Shar Whisenhunt

Mentor: Dr. Diane Cook;

Department of Computer Science Engineering

Abstract

Many of the artificial intelligence techniques developed to date rely on heuristic search through large problem spaces. Unfortunately, the size of these spaces and corresponding computational effort reduce the number of problem domains for which otherwise novel and effective algorithms would be applicable. A number of parallel and distributed approaches to search have considerably improved the performance of certain aspects of the search process.

We have designed the Eureka system, which combines the benefits of many different approaches to parallel heuristic search. Eureka uses a machine learning system to decide upon the optimal parallel search strategy for a given problem space. When a new search task is input to the system, Eureka gathers information about the search space and automatically selects the appropriate search strategy. Eureka includes diverse approaches to task distribution, load balancing, and tree ordering, and has been tested on an nCUBE 2 with 64 processors. Results in several problem domains indicate that Eureka outperforms any existing strategy used exclusively for all problem instances.

Although Eureka provides a useful tool for scaling up AI systems, the availability of massively parallel MIMD machines precludes wide-spread usage of the system. In this project we will port the Eureka system to a network of Pentium PCs running the Parallel Virtual Machine (PVM) software. Tests will be run to compare search times of various strategies and the results will be fed to the machine learning system. In this way, Eureka can make an optimal set of strategy choices for either parallel computers or distributed networks of workstations. For the PVM version, we expect that Eureka will outperform any existing strategy as it has for the nCUBE.

Introduction

Because many of the Artificial Intelligence techniques rely on heuristic search through large problem spaces, improvements need to be made in searching these problem spaces. While several approaches have been developed that improve parallel search algorithms, the problem lies in deciding which of these approaches to use for a particular problem instance.

EUREKA is a parallel search engine that we have developed which combines several approaches to parallel search using IDA* (Russell & Norvig 1995). The first part of my project was to help expand EUREKA to run on 8 distributed workstations running the Parallel Virtual Machine (PVM) software (Geist et al. 1994). My work consisted of adding code to an existing version of the EUREKA PVM program to incorporate a load balancing strategy. With this new strategy, the second part of my project was to run timing tests for 60 problem instances using two load balancing options (nearest neighbor and random se-

lection) and compare the results.

Finally, C4.5 (Quinlan 1993), a machine learning system, was used to select optimal strategies for future problem instances based on rules it created from examining the above timing test results. New problem instances were then fed to C4.5 and the results were compared against actual best strategies for each problem instance.

Load Balancing

Load balancing is one of the methods used to increase the efficiency of searching through large problem spaces. Initially, work is distributed to the available processors by using either parallel window search (Powley & Korf 1991) or distributed tree search (Kumar & Rao 1990; Rao, Kumar, & Ramesh 1987) as selected from the task distribution options. Because it is inefficient for a processor to remain idle when it runs out of work, we have added a load balancing strategy which allows one processor to request work from another. One method is the nearest neighbor approach (Mahapatra & Dutt 1995) which simply requests work from either its left or right neighbor. Random selection is another method which randomly chooses another processor from which to request work.

Nearest neighbor may work best when the work is more evenly distributed among neighborhoods of processors. As the processors are set up in a ring, it is faster to pass a message to a neighbor than to a processor across the ring. A message must go through all processors between the sender and receiver which can be time consuming if the ring is large and the sending and receiving processors are not close together. However, when there is a large imbalance of work from one neighborhood to the next, random selection may work better. Although more time will be spent passing messages, neighborhoods on one side of the ring which are running low on work will be able to request work from neighborhoods on the other side of the ring which may have a lot of work. One strategy is not better than the other for all problems. It depends on the particular problem instance as to which strategy will work best. Eureka

EUREKA combines several strategies including task distribution, load balancing, and ordering techniques and uses the C4.5 machine learning system to decide upon the use of a strategy and to assume the task of selecting the parameters that control the strategies. For example, C4.5 may choose either nearest neighbor or random selection for the load balancing strategy. C4.5 induces a decision tree from the pre-classified test cases that can be used to classify new problem instances. Each test case is described using features of the corresponding problem that are known to affect the optimal choice of strategy.

These features for load balancing include:

Branching Factor: The average branching factor of the search tree.

Heuristic Error: The difference, on average, between the estimated distance to a goal node and the true distance to the closest goal node.

Imbalance: The degree to which nodes are unevenly distributed among subtrees in the search space.

Once the learned rule base is in place, C4.5 can make strategy selections for a new problem instance. Experiments reveal that all of the sampled features are fairly stable in many search trees. Features such as branching factor, heuristic error, and imbalance will have similar values from level to level in the tree. As a result, these values can be collected from an early level in the tree and represent good indicators of the rest of the search tree.

Results

Once the timing results for the two methods of load balancing were collected for 60 problem instances, speedup was determined for each problem instance for both nearest neighbor and random selection. Speedup is determined by dividing the serial time (the time it took to run on one processor) by the parallel time (in this case, the time it took to run on eight processors). The search strategy that produces the best speedup is considered to be the “correct” classification of the corresponding search tree for C4.5 to learn.

Three-fold cross validation was used on the fifteen puzzle data to capture the results of C4.5. This means that the learning system for EUREKA was trained by providing C4.5 with 40 problem instances with solutions. C4.5 was then fed 20 new problem instances for which it decided which load balancing option should work best. This was repeated three times using different sets of training and test problems.

Speedup results were averaged over all test problems for the C4.5-selected load balancing option as well as for nearest neighbor, and random selection. We compared the results of C4.5-selected load balancing options to each option used exclusively and found that C4.5 outperformed both nearest neighbor and random selection. The average speedup for nearest neighbor was 7.27%. The average speedup for random selection was better at 7.56% while the average speedup for C4.5 was slightly better than both others at 7.76%.

Conclusions and Future Work

While C4.5 did yield the best speedup, it was only a very small improve-

ment. Due to time constraints, I chose to use only a few problem instances, and the problems I chose were relatively short. It has been shown that C4.5 performs best with longer problems and a large domain of problems. Future work will address these issues as well as add more search strategies, more problem domains such as the nQueens problem, and more architectures to EUREKA.

Acknowledgements

I would like to express my appreciation to the McNair Scholars Program, my mentor: Dr. Diane Cook, R. Craig Varnell, and Joshua Whisenhunt for his patience.

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The African Tribe: Ethnic Identity as a Social and Political Control Mechanism during Twentieth Century British Imperialism in Tanganyika

Sefakor Amaa

Mentor: Dr. Elisabeth Cawthon, Department of History

Abstract

This research examines the formation of “tribes” in the context of British indirect rule and its affect on defining the African identity during the 20th century. The creation of new tribes in Tanganyika, such as the Sukuma and Nyakusa, model an indigenous response to the British’s need for tribal organization as an administrative instrument. Residual effects of Britain’s use of ethnic identity as a method of control is highlighted by a brief survey of 20th century ethnic conflicts occurring in Africa which have their basis in the artificial “states” created by the colonizers. The research culminates in the development of an African-centered lecture on British Imperialism that is adaptable to mainstream Western civilization and European history courses. An “optional use” introductory lecture designed to encourage employment of critical thinking skills towards educational materials about Africa has also been designed. My pedagogical concepts and teaching strategies are informed by intensive study conducted during the Yale University 1997 PIER African Studies Summer Institute, “The Teaching of Africa: Reflections of the Environment in the Arts, Humanities, and Social Sciences.” This research represents a departure from the traditions of: (1) omitting Africa and her Diasporic influences as factors in the discussion of Western civilization, and (2) viewing events of historical consequence strictly from a European perspective.

Introduction

“I envision the McNair Program as an opportunity to show students who are interested in graduate study, What it is to be a historian! At UTA, like many other institutions, the practice of one’s craft as a historian means wearing many hats at the same time . . . historians are encouraged to pursue research, produce written works, and engage in university and professional service, as well as teach.”

- Dr. Elisabeth Cawthon

These were the words that began my summer fellowship as a mentee working with Dr. Elisabeth Cawthon in the History Department of the University of Texas at Arlington. True to her vision, Dr. Cawthon has sought to bring the reality of a historian’s life to the mentoring process. We jointly collaborated on what exposures to the “craft” would be most beneficial to me as I embark on graduate studies and aspire to become a teaching assistant. This collaboration resulted in the fusing of my individual academic interests with those elements of the craft that she judged vital to my immediate development:

Continued pursuit of my interest in African History by using an African-centered vantage to examine British imperialism during some phase of the 18th, 19th, or 20th century. We selected the 20th century and British imperialism in Tanganyika. The decision on this period and specific country was due in part because of England's late possession of the colony, the prior history of German rule and Tanganyikan resistance, and the frequent scholarly neglect of this area of Africa in deference to earlier British imperialism and colonization efforts in West Africa.

Research in this area was crystallized by the development of a lecture that is to be presented in a "guest lecturer" format during the upcoming fall semester in Dr. Cawthon's British History classes and Dr. Allusine Jalloh's Western Civilization and African History courses. Development of the lecture provided opportunities for primary and secondary research, as well as the exposure to the teaching aspect of "being a historian."

My mentor encouraged me to accept a fellowship of study at Yale University's 1997 PIER African Studies Institute. The institute demanded two weeks of intense study and interaction with noted national and international scholars, but because of the time investment it appeared potentially conflicting with the McNair fellowship. After reviewing the Institute's agenda and pre-mailings, she coached me to understand that this was exactly the type of exposure and learning situation she sought to create for me and went about incorporating the Yale opportunity into my mentee plan and assisting me in exploring avenues for financial support of the study program. Learning how to secure funding for research is a vital activity for students planning graduate and doctoral study.

In addition to the study program in pedagogy, teaching strategies, and African scholarship, Yale University allowed the Fellows full access to its library holdings and other research facilities. Consequently, the development of my lectures are informed by resources that would not have otherwise been available to me.

While this summer's McNair Research Fellowship departs from the tradition of "investigation and report" based on an empirical model, the following narrative and lecture designs are the result of many hours of concentrated research and study. Any errors or instances of naiveté I accept as my own, but the immense value the process has added to my academic and professional growth I credit to the extraordinary guidance and role modeling provided by my mentor.

Literature Review and Research Methodology

The greater part of my research was spent doing literature reviews for the lectures. I became more than familiar with the libraries at the University of Texas at Arlington, Southern Methodist University, and Yale University. During the course of this research, I learned to appreciate both the joys and difficulties of primary documents. At SMU I gained access to primary documents belonging to Sir Lord Hailey, an administrator of the British Colonial Office. Sir Hailey's documents offered a detailed account of the policy and structure of Britain's Indirect Rule in all of her African colonies and protectorates. At Yale, I was able to examine correspondence and documents from Sir Donald Cameron, the Governor of Tanganyika who implemented Indirect Rule in that country in 1925. Through the Internet primary and secondary works not readily available in the United States were made available, of particular use were unpublished manuscripts and journals from Dar es Salaam and Zanzibar.

After reviewing basic texts on Tanganyika in particular, and Africa in general, I settled on John Iliffe's *The Modern History of Tanganyika*, Monica Wilson's ethnic studies of the indigenous peoples of Tanganyika, and Basil Davidson's *The Black Man's Burden* as informing works to the lecture and for pre-class readings. I particularly sought balance in African and European perspectives of the colonization experience in Tanganyika.

A contemporary perspective of Africa and ethnicity was acquired through Oliver Furley's *Conflict in Africa* and telephone interviews with 72 of a 100 sample size group of African nationals from West, East, South, and Central Africa. The interview team, led by Martha Melaku, was unable to contact any of the nationals from North Africa, therefore, North African responses to the ethnic identity survey are not represented in the summation of findings displayed



on the pie chart. Again, the pedagogy and approach to studying and teaching about Africa owe much to Yale University's PIER African Studies Institute and the excellent modeling provided by my mentor and Dr. Allusine Jalloh.

Lecture

“The African Tribe: Ethnic Identity as a Social and Political Control Mechanism During Twentieth Century British Imperialism in Tanganyika

Introduction/Overview

When the World War I Peace Conference met in January 1919, Belgian troops occupied Rwanda, Burundi, Biharamula, and the northeastern shore of Tanganyika. The Portuguese occupied a tiny enclave known as the Kiongo Triangle and the remainder of German East Africa was under British occupation. The Peace Conference largely confirmed this division; a division necessitated by a ‘spoils of war’ sanction towards Germany. British and Belgian negotiators agreed that Belgium should retain Rwanda and Burundi while abandoning the eastern shore of Lake Tanganyika and the western shore of Lake Victoria, thus Britain would have definitive lines of communication from East to West, and from North to South in defense to German submarine activity. The Portuguese, however, refused to relinquish control of southern Mozambique or the lower Congo and this thwarted South Africa’s plans to acquire possession of southern Mozambique in exchange for southern Tanganyika. Additionally, Belgians had sought transfer of the southern bank of the lower Congo from Portuguese Angola to the Belgian Congo. When the “dust cleared,” all had been less than successful except the British. The Portuguese came away without increased holdings; South Africans failed to acquire southern Mozambique; and the Belgians basically gained a mandated territory they did not want. German East Africa gained a new name, Tanganyika, and boundaries she retained until 1964.

The British Mandate (1922) provided that Britain have full powers of legislation and administration over Tanganyika, while binding her (Britain) to promote the material growth, moral well-being, and the “social progress” of the inhabitants of the new territory. The task now remained how best to rule and administer Tanganyika.

Indirect Rule

Britain’s late possession of Tanganyika had inherent benefits to her colo-

nizing efforts in East Africa. Indirect rule in Tanganyika was based on the model conceptualized by Frederick Lugard and implemented in Nigeria about 1912. By the time Britain gained control of Tanganyika, the concept had become a doctrine of British colonial policy. The doctrine amounted to dividing or reorganizing ethnic groups under the guise of administrative efficiency. The underlying philosophical belief among the British was that all Africans were distant relatives of the same tribe in one way or the other, thus their primordial identities were compatible in any of various tribal formations:

THE BRITISH BELIEVED THAT ALL TANGANYIKANS BELONGED TO TRIBES
THEREFORE
TANGANYIKANS CREATED TRIBES TO BELONG TO



Prior to Arab and European invasion, Tanganyikans had a circle of identities. During pre-colonial times each individual belonged to an assortment of social groups, inclusive of nuclear family and extended family, lineage and chiefdom, and in some cases clan and tribe. Contrary to popular belief, Tanganyika was not primarily composed of tribes; its groups and identities were formed in other ways. A survey of more than twenty ethnic groups in Tanganyika suggests that colonizers erroneously adapted local expressions of geography and environment that were used externally of the groups to be tribal names. In the Northeast, the name for a group called the Shambaa was a local descriptor of the place where the people lived; Shambaa literally means “where bananas thrive.” The name was used by others external to the community. The Shambaa did not originally call themselves by that name, in fact, their indigenous language did not contain an ethnic for themselves. The group traced

their origin through the myth of the hunter Mbegha. Their lowland neighbors included the Bondei, literally “people of the valley.” To the south lived Ngulu, Kaguru, Luguru, Vidunda, the Sagara, and the Matumbi, all of whom had names that translated to “highlanders.” The Kichi translated to people of “the waterless country” and the Makonde to inhabitants of a “thicket-covered plateau.” To the West of the rift valley names most commonly used for tribe names were either political states (usually chiefdoms) or directional indicators. The Sukuma were an example of the latter, their name simply meant “northerners” and was used by their southern neighbors.

Oversimplifying a bit, but theoretically congruent, by moving their homes and adapting to new locations or environments, people changed their identities. Shambaa who left the mountains and the bananas ceased to be Shambaa, and Sukuma became Ngulu by moving southward and joining a Ngulu community. Clearly, ethnic identity in pre-colonial Tanganyika was fluid and amorphous.

Pre-colonial political identities were just as autonomous. Tanganyika provided a range of political formations from complete statelessness to chiefdoms administered by appointed officers. Statelessness was most common in sparsely populated areas. The Makonde, for example functioned politically around two units of organization: a matrilineal kinship grouping and the chirambo, the latter being a territorial group which was headed by a mkulungwa. The mkulungwa had only limited ritual and judicial leadership over anyone who chose to remain his neighbor; the chirambo, you see, frequently divided and formed new ones with members free to stay or depart with the new grouping. Those who departed retained no affiliation with the former as a political unit. Research has not revealed any point in Tanganyikan history where the Makonde were ever politically unified. Just as we saw with ethnic identity, political identities were also fluid and amorphous.

The goal of Indirect Rule was to bring order to indigenous identities for administrative purposes. Until 1925 Tanganyika was administered under essentially the same structure that the Germans had put in place: 22 district officers reporting to the secretariat in Dar es Salaam and using mostly akidas as agents of enforcement. This changed with the assignment of Sir Donald Cameron to the position of Governor. After nearly seventeen years in Nigeria, using Indirect Rule, Cameron seized the political opportunity to make his mark in Tanganyika through implementation of the doctrine there. The notion of the “tribe” lay at the heart of Indirect Rule in Tanganyika. Refining the racial thinking prevalent amongst the previous German rulers, British administrators believed that every African belonged to a tribe, just as every European belonged to a nation. Research revealed that this mode of thinking owed much to the Old Testament. to Tacitus and Caesar, and to Western models of “statehood.”

The latter made academic distinctions between tribal societies based on status and modern societies based on contract. Additionally, preferences of language among post-war anthropologists initiated a change to the word "tribal" from the more pejorative "savage." All of these factors combined to give European legitimacy to the idea of "the African tribe." Tribes were, therefore, seen as cultural units "possessing a common language, a single social system, and an established customary law." The British, under Indirect Rule set about to ensure that Africans in Tanganyika conformed to their ideal, they had the power and they made it happen, forever changing the ethnic landscape of the country.

Under Indirect Rule the administration consisted of three parts: a native authority, native courts, and a native treasury. Its essence was the complete integration of indigenous political systems into the colonial administration so that the result was one single government to which indigenous people were accountable. Using their ideas about tribal authority, the British sought to manage that authority through controlled appointments of tribal chiefs and councils. Research revealed that many unusually well-informed officials knew the idea of "the African tribe" was a myth, but they remained silent in the face of Cameron's strong political support from London, and for the lack of a more expedient process. The administrative needs of the British may have proved transient however, had it not coincided with the needs of Tanganyikans. They had lived through prolonged periods of hardship and strife under German rule; Tanganyikans wanted effective units of action just as officials wanted effective units of administration. Many Africans had strong personal motives for creating new units which they could lead, and hopefully, through which they could gain concessions from the administration. To this end Tanganyikans entered into a phase where mythical history and exaggerated claims of royalty and divine lineage became the rule - if tribes were to be the administrative unit, every Tanganyikan wanted to belong to a tribe, preferably as a paramount chief, or in kinship to the royal line.

Conclusion

Under Indirect Rule there were many harmful episodes, but the proven effectiveness of United Action remained a staple upon indigenous Tanganyikans. Its independence under Nyerere on December 9, 1961 was a result of gradual nationalism - unity by tribe had proven to be the prototype for unity as a nation. Currently, media headlines broadcast almost daily accounts of "ethnic warring" on the African continent, as historians look to causes and prospects for peace. The field research part of this summer's fellowship sought to address itself to those issues.

Our research found that colonial configurations of ethnic or tribal identity do bear to the proliferation of ethnic conflicts in Africa, but they are not the cause. More accurately, populations of people situated in pockets of artificial ethnicity merely exacerbates the competition for limited resources. This was the case during British colonialism in twentieth century Tanganyika that lead to Africans embracing the concept of "the African tribe" and it is the underlying cause between most ethnic conflicts on the continent today, be they tied to tribal, religious, or territorial claims. Africans, like all peoples, have always had conflicts; the strong have sought to rule the weaker, both in instances of individual and collective gain, however, few other peoples have had their lands and resources exploited to the extent of the African experience. Historical evidence confirms that the colonial models inherited by the African "states" were designed for political and social control of the masses and privileged entitlements for the few. When resources are scarce, people unit around expedient identities and separate from what they believe to be constraining ones. In a survey of 100 African nationals residing in the United States and from which we received a 72% response rate, we learned the following about how they perceive their ethnic identity. Of those responding, 80% aligned more closely with their national identity, i.e., Tanzanian or Ghanaian as opposed to only 10% who vested more heavily in a primordial identity with their ethnicity or tribe, i.e., Luo or Ashanti. Only 2% expressed a level of Pan-Africanism through the identifier "African." And finally, 8% were focused on the geographical origin of their identity, i.e., East or South Africa. Africans originating from countries with high white settlement populations were more apt to identify geographically, while those with less ethnic conflict in their countries tended to reflecton ethnic identity more nationalistically. Most respondents, over 87%, identified government corruption as the major threat to sustained peace in their countries and saw this resulting in poverty to the masses of people. What does this tell us about the contemporary African "tribe"? It tells us that Africans, like all peoples, exist within a circle of identities and, in general, are not confined by one particular aspect of their identity. Further, that ethnic identity in Africa is fluid and amorphous, a fact confirmed by an examination of 20th century British imperialism in Tanganyika and the creation of the "African tribe."

“De-Mythifying Tarzan: What Do You Really Know About Africa?”

Introduction

As the world moves towards the realization of the “global village,” it becomes increasingly essential that students encounter a “global experience” in the classroom. Oftentimes the opportunity for this experience is either thwarted or inhibited by subliminal misconceptions that the student brings to the classroom about subtexts of the curriculum. This lecture is designed to be an introductory survey of different aspects of African peoples, inclusive of their geography, history, environment, culture, and institutions.

The lecture title is intentionally provocative to attract a diverse student group on several levels: (1) through the representation of an identifiable visual media persona encountered at some point of life by most age groups, (2) by a tacit employment of a suggestive satire, and (3) through a subtle challenge to the student’s knowledge base. Of equal or greater significance, the lecture title promises a classroom experience that the student can apply to observable phenomenon, thereby creating a contemporary and reality-based interpretation of the educational material.

Learning Objective

The learning objective of this lecture is to develop or strengthen the student’s critical thinking skills to the end of allowing research and study against the grain of potentially biased educational materials. This end is to be achieved while simultaneously increasing the student’s knowledge of the peoples who occupy the global village. The lecture is informed by the pedagogy of multicultural education in the context of equalizing classroom power to facilitate an “inclusive” consciousness of the student’s role as a world citizen.

Scope and Targeted Student Population

Learning objectives are targeted to students in the freshman and sophomore undergraduate group (1000-2000 course level). The lecture is broadly constructed across disciplines to allow adaptability to multiple classroom environments. It is easily adaptable to the format of a “guest” lecture or presentation to acquaint students with the study of other cultures in a non-threatening environment or for use as an introductory “topics lecture” supporting more advanced study in a concentrated subject or term course, i.e., Western civilization, African history, or cultural anthropology. Additionally, the lecture is de-

signed to accommodate an examination of the role of media and cinema in the formation of ethnic identity, a subject area of current concern to literature, journalism, and mass communications students.

Course Strategy

The course strategy is to engage the student in a confrontation of misconceptions and myths about Africa through the use of mixed media. This allows for the creation of a learning distance that does not directly challenge the student's community, home, or primordial identities (the biggest threats to multicultural education). Rather, through critical analyses of the various media forms, the student learns to deconstruct the myths and misconceptions that have been absorbed on a subliminal level, or in worst case scenarios, on an overt or conscious level. Because the student is academically challenged, participates in the deconstruction, and can relate the process to observable contemporary phenomenon; he or she accepts ownership of the newly acquired or strengthened skill and is more likely to apply it to other learning situations. The learning outcome is thus, at once, academic and reality-based.

Suggested Classroom Tools and Methodology

- **Pre-Readings:**

Keep to a minimum so as to maintain the "discovery" process.

Suggestion: Article by Clyde Taylor, "Two Women"

Subject: Psychological Space in American and African Cinema

Source: Periodical - **Journey**

Article by Sheila S. Walker, "Tarzan in the Classroom"

Subject: Myths about Africa

Source: **Journal of Negro Education**

- **Informal Pre-Test (for discussion only)**

Allows the student to evaluate his or her general knowledge about Africa without the intimidation of public embarrassment or a comparative norm. The lecturer should introduce the pre-test as "commonly held" beliefs and perceptions about which the student has the opportunity to evaluate on a true/false or multiple choice basis. **NO TRICK QUESTIONS OR STATEMENTS** as this tends to affect the learning process by undermining the student's confidence level, inhibiting student participation, and distorting the instructor/student "trust" factor. See Exhibit I for a sample pre-test.

● Suggested Audio Visuals

Clips from “old” or “new” Tarzan TV series or box office movies (20-30 minutes).

A World of Ideas: Chinua Achebe

Produced by PBS Video, 1989, 30 minutes, Color, English

A Closer Look at Africa

Produced by Yale University

PIER African Studies Institute, 1993, 20 minutes, Color, Filmstrip

● Suggested Literary Excerpts

Heart of Darkness: Joseph Conrad

Things Fall Apart, A Man of the People, No Longer at Ease:

Chinua Achebe

“The Old Chief Mshlanga”: Doris Lessing

God’s Bits of Wood, Xala: Ousmane Sembene

The Beautiful Ones Are Not Yet Born: Aye Kwei Armah

Art History in Africa: Jan Vasina

Flash of the Spirit: African and Afro-American Art and Philosophy:

R. F. Thompson

Note: Any combination of classroom tools may be used as long as they are subject and contrast balanced. All of the materials listed in reference have been previewed and deemed either to portray the African environment in a realistic manner or the positive features and teaching opportunities outweigh their drawbacks. Care should be exercised in the use of Conrad, Lessing, and the Tarzan clips. It is of critical importance that their stereotypical depictions are deconstructed in the classroom through the use of contrasting media and student participation. Achebe’s film and written excerpts provide a good take-off point for the discussion.

Lecture and Class Discussion

- Where in the curriculum does Africa belong?
- American History Courses
- World History Courses
- European History Courses
- American and World Literature Courses
- Art and Art History Curriculum
- Economic Courses

- Geography and Cartography Courses
- Journalism and Communications Courses
- Others _____

Note: The compilation of the list for places where Africa fits in the curriculum should be lecturer led, but the listing should be compiled through a participative process with reasons given why Africa fits into a particular curriculum.

- Issues and Concerns
- Myth and reality in studies in of Africa
- Myth and reality in media
- Inappropriate materials
 - Let's Critique African Materials - Handout and Exercise (See Exhibit II)
 - Criteria for Evaluating Materials on Africa - Handout (See Exhibit III)

Comments

Teaching and learning about Africa can be an exhilarating experience. The opportunities for both are limited only by the creative imaginations of the instructor and the students. In the course of students developing their critical thinking skills, we all learn that people are different in the ways they express themselves and in their appearance, dress, housing, music, art, and even their institutions and world views; but it is precisely those differences that give variety and richness to the human race and the human experience.

Comments, questions, and suggested enhancements may be directed to me via E-mail at lam2242@utarlg.uta.edu.

Classroom materials not readily available may be obtained through the University of Texas at Arlington's Africa Program in conjunction with Yale University's PIER African Studies Institute.

EXHIBIT I

Pre-Test (For Discussion Only)

What Do You Really Know About Africa?

Read the statement below and write T for true and F for false in the space provided.

_____ 1 Africa is the second largest continent in the world.

- _____ 2 Most of Africa is Tropical rain forest.
- _____ 3 Africans began living in cities about 100 years ago.
- _____ 4 Africans are able to get news from other parts of the world.
- _____ 5 Most Africans see big wild animals every day.
- _____ 6 All Africans are black.
- _____ 7 Many Africans live in villages.
- _____ 8 Africans who live in villages are able to travel to many other places.
- _____ 9 Life in Africa today is much the same as it was in the past.
- _____ 10 Africans had many contacts with the rest of the world before Europeans arrived.

EXHIBIT II

Criteria for Evaluating Materials on Africa

1. Is Africa characterized as a country rather than a continent?
2. Is North Africa treated as though it is not a part of Africa?
3. Are offensive/inaccurate or biased terms used?

Inaccurate/offensive terms: native, hut, jungle, witch doctor, dialect, primitive, warlike, uncivilized, pagan, tribe.

Inaccurate/offensive names for groups: Bantu (correct: Bantu-speaking), Pygmy (correct: Mbuti), Bushmen (correct: San or hunter-gatherers), Hottentot (correct: Khoikhoi).

Western bias: developing, under-developed, civilized, emerging, backward, non-white, non-Western, Black African, communist.

4. Is the focus primarily on lifestyles of minorities that are not typical of Africans? (e.g. San, Mbuti, Maasai). Is polygamy overemphasized? Are

foods or customs made to seem strange or revolting?

5. Is Africa presented only in terms of problems, of what Africa doesn't have? Are topics addressed that are not studied when Europe and North America are studied?
6. Is history presented in chronological stages beginning with early and ancient times or is the primary focus on the colonial period and the actions of Europeans in Africa?
7. Are Africans described as "animists" who worship trees, rocks, or in sects?
8. Are folktales over-represented in elementary collections?
9. Are the illustrations representative and balanced?
10. Do collections and curricula reflect an infusion of knowledge about Africa into various disciplines and subjects?
11. Do materials reflect African viewpoints and perspectives?

EXHIBIT III

Let's Critique African Materials

How can we tell when reading materials reflect bias, stereotypes, or inaccurate information? What should we look for? Listed below are some guidelines for critical reading. The subtle shadings of opinion and omission of relevant information are perhaps more dangerous than the use of outrageous words. Let's examine some of these more carefully.

"Stop" words: when we see these words used, we recognize stereotypes or patronizing and degrading words. We can substitute less value-laden words.

Look at the pictures: how many stereotypes do they support?

1. Are Africans dressed in few clothes?
2. Do they wear masks?
3. Are they dressed in grass skirts or animal skins?

4. Are wild animals in the photos?
5. Are Africans shown as dancers, musicians, and poor farmers or as doctors, teachers, and business people?
6. Are there both rural and urban scenes?
7. Is the focus on the exotic, the strange, the bizarre? Are differences (viz. The U.S.) rather than similarities stressed?
8. Are the maps up to date? Check for Zimbabwe, Benin, Western Sahara, Republic of the Congo (Zaire), etc.

Examine the content for these critical viewpoints:

1. Is it implied that Africa will be better (civilized) when it becomes more like the West?
2. Is the emphasis on minority groups, such as the Maasai, San ("Bush men"), or Mbuti ("Pygmies")? This emphasis is similar to studying the United States by concentrating on the Indians, Mexican-Americans, and Hawaiians.
3. Does African history begin with European discovery? What treatment is given to ancient African kingdoms besides the Egyptian?
4. Is the slave trade openly discussed with both European and African sides presented?
5. Are both the pros and cons of colonization discussed?
6. Are Africa's economic, political, and cultural contributions to the world described?
7. Is the interdependence between African nations and the West demonstrated?
8. Are apartheid and its effects explained adequately?



A Comparative Analysis of White Collar Crimes and Street Crimes: Do Cost and Punishment Differences Exist?

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Abstract

One of the most pressing public policy issues confronting local, state, and federal authorities is the dramatic increase in the prison population. The state and federal prison population was comprised of 329,821 in 1980, it almost tripled to 883,656 in 1992, and by the end of 1994 there were 1,053,738 prisoners (Bureau of Justice Statistics 1995). This increase has been attributed to many factors leading to stiffer penalties primarily focusing on street crimes while punishment for white collar crimes has been largely ignored. It is this researcher's contention that white collar crimes are just as serious as street crimes. Yet, punishment is more lenient toward white collar crimes. Therefore, the purpose of this research is to provide a comparative analysis of white collar crimes and street crimes by focusing on punishment and cost. This analysis will be conducted by reviewing prior studies and official statistics on crime. This researcher expects to provide evidence to show significant differences in punishment and the overall cost of white collar crimes in comparison to street crimes, answering the question "Is white collar crime more serious than street crime?"

Introduction

The problem of crime in the United States continues to be an issue of widespread concern. National media attention focuses on the problems of street level criminal activity, rarely giving massive coverage on white collar crimes, such as a "businessman" who bribes an elderly couple out of their life savings. Therefore, this researcher addresses the question, Is white collar crime more serious than street crime in terms of cost and punishment?

To properly address this question, white collar crime and street crime must be defined. It has become increasingly clear that the definition of white collar crime is the subject of dispute by criminologists. This dispute is primarily due to the debate of whether white collar crimes are defined by the nature of the offense or by the status, profession, or skills of the accused. White collar crimes include offenses such as counterfeiting, embezzlement, forgery, fraud, and regulatory offenses on price-fixing, hazardous waste, and tax evasions (Bureau of Justice Statistics 1987). On the other hand, street crimes include offenses such as murder, rape, aggravated assault, robbery, motor vehicle theft, arson, burglary, and larceny-theft (Uniform Crime Report 1995).

White collar crimes are usually less visible than street crimes, but their overall economic impact may be significantly greater. According to Barkan (1997), the annual estimated economic loss was \$13 billion for street crime

and \$415 billion for white collar crime. Ironically, white collar crimes tend to be committed by financially secure, well educated, middle or upper class people. These individuals are not easily suspected of committing a crime because of the stereotype of how a criminal is supposed to look, which is poor, uneducated, young and a minority. Therefore, this enables the white collar offender to be bold and confident in their illegal acts, knowing that their chances of getting caught are slim to none. Moreover, the lack of severe punishment does not offer a deterrence to the white collar criminal. Those convicted of street crimes were more than twice as likely as white collar offenders to receive a sentence of more than five years while white collar offenders were more likely to be sentenced to probation or fined (Bureau of Justice Statistics 1987). Therefore, this research is designed to compare the cost and punishment ranges of white collar crimes and street crimes. This task will be accomplished by examining prior research on the subject, selecting an appropriate methodological approach, and generating initial findings to address the research question.

Surprisingly, very few people are aware of the type, frequency, and leniency of punishment involving white collar crimes. Emphasis on street crimes has overshadowed the effects of white collar crimes. Consequently, people need to be aware of the vulnerability of being a victim to white collar crimes just as they are to street crimes.

Literature Review

The subject of white collar crime was brought to the forefront through the contributions of Edwin Sutherland who was the first to coin the term "white collar crime." In fact, Sutherland openly criticized criminologists for focusing more attention on theories linking crime to poverty, as well as psychopathic and sociopathic conditions. The criminologists of his time focused almost exclusively on explaining lower class criminality while providing very little understanding of middle and upper class criminality. It was Sutherland's viewpoint that not enough attention was devoted to white collar crimes involving persons of respectability and high social status (Friedrichs 1996).

This lack of attention focusing on white collar crimes is at the core of the debate on sentencing disparity. Chambliss theorized that sentencing disparity is largely a result of the content and operation of criminal laws. In other words, he believed that acts are defined as criminal because it is in the interests of the ruling class to define certain behaviors as criminal. He further theorized that the ruling class can violate criminal laws while others will be punished (Chambliss 1975). Criminologist, Richard Quinney, directed his attention on the lawmakers instead of the lawbreakers to explain the differences in sentencing. He stated that in any society conflicts between persons, social units,

or cultural elements are inevitable and power is the basic characteristic of social organization (Quinney 1970). Basically, laws allow those in control to gain what they define as legitimate access to scarce resources, and to deny such access to the politically disenfranchised (Schmalleger 1997). This deprivation renders those in power to impose obvious sentencing differences between white collar offenders and street offenders. Sentencing differences have become increasingly obvious under mandatory sentencing guidelines.

Mandatory sentencing laws require prison terms for offenses such as drugs offenses, drunk driving, and gun related crime. These offenses require a minimum number of years for the offender to serve. In theory, lawmakers enact mandatory sentencing laws so that punishment will be consistent. In practice, however, mandatory sentencing policies are at the center of the controversy on sentencing disparity (National Council 1995). The belief that white collar criminals are "not habitual or violent criminals" has resulted in street crimes being the main focus under mandatory sentencing policies.

Research Question

Is white collar crime more serious than street crime in terms of cost and punishment?

Methods

In this study the researcher used official data and reviewed prior studies. Official data were obtained from the Uniform Crime Report compiled by the Federal Bureau of Investigation. This data base allowed the researcher to review statistics on street crime. Secondly, data from the National Center on White Collar Crime were reviewed. Statistics from this data base were useful in obtaining information on white collar crime. Thirdly, data reviewed from the Bureau of Justice Statistics provided statistics on prison and jail populations, crime rates and sentencing trends. Finally, prior studies were reviewed to obtain information on cost and punishment comparisons.

Findings

The following is a comparison of white collar crimes and street crimes in terms of cost and punishment. The National White Collar Crime Center (1997) suggested losses from white collar crime may be 10 to 20 times higher than personal and household crime together. For example, employee theft (embezzlement) was \$5 to \$435 billion annually, counterfeiting was \$.815 to \$10 billion, and insurance fraud ranged from \$17 to \$100 billion annually (National White

Collar Center 1997). On the other hand, the Uniform Crime Reports (1995) estimated burglary to be \$3.3 billion annually, larceny was \$4.3 billion, and losses for motor vehicle-theft was almost \$7.6 billion. Additionally, Friedrichs (1996) suggests that 20 years of property crime is less than the billion of dollars in losses of the savings and loan failures. These findings clearly show that financial losses are more prevalent with white collar crimes than street crimes.

In terms of punishment ranges, the Bureau of Justice Statistics (1987) shows that those convicted of white collar crimes received shorter average sentences of incarceration (29 months) than other federal offenses (50 months). In addition, 17 percent of defendants convicted of white collar offenses were incarcerated and twice as many were ordered to pay fines. Furthermore, the average penalty for criminals who commit property crimes is two to three years (Ostrom and Kander 1995), while the average sentence for a white collar property crime ranged from six months to one year in prison (Fleetwood, Lubow 1975). On the other hand, the Bureau of Statistics (1994) shows the length of sentences for violent offenses is 88 months compared to fraudulent offenses at 20 months. Under the federal sentencing guidelines first-time drug offenders may receive as much as 20 years to life, while punishment for white collar offenders is lenient.

Here are some examples of high status occupational offenders receiving minimal punishments for their crimes (Fleetwood, Lubow 1975).

<u>Criminal</u>	<u>Crime</u>	<u>Sentence</u>
John Galanis	A portfolio manager of two mutual in prison and funds, Galanis milked investors out of nearly \$10 million.	Six months five years probation.
Valdemar Madis	A wealthy drug manufacturer, Madis diluted an antidote for poisoned children with a look-alike substance.	One year probation and a \$10,000 fine.
John Morgan	President of Jet craft, Ltd., Morgan illegally sold about \$2 million in unregistered securities.	One year in prison and a \$10,000 fine.
David Ratliff	Ratliff spent twenty one years as a Texas state senator embezzling state funds.	Ten years probation.

Ivan Projansky	The former chairman of the First National Bank of Lincolnwood, Ill., Projansky raised stock prices artificially and then dumped the shares, costing the public an estimated \$4 million.	One year in prison and two years probation
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Overall, white collar offenders are not being punished with the same intensity as street offenders.

CONCLUSION

Based on the evidence in this research, white collar crimes are perpetuated by the media and society as not being “real” crimes. White collar offenders have a much greater chance of getting fined and/or probation compared to a street offender. Although, the cost of white collar crimes is tremendously greater than street crimes, white collar crimes are treated like minor offenses. The initial findings generated in this study suggests a need for further research and investigation.

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Bilingual Education Si, O No?

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ABSTRACT

Is there a difference in test scores between five third (3rd) grade native Spanish speakers (N=5) enrolled in a bilingual education program, (SBE) and five third (3rd) grade native Spanish speakers (N=5) in a regular classroom (SRC) identified as eligible for bilingual education without parent approval for special language program? Is there a difference in the parents attitude towards bilingual classes and regular classes. I will look for achievement levels as indicated by test scores on the ITBS (Iowa Test of Basic Skills) for both groups. I will conduct structured and unstructured personal interviews with the ten students' families in their homes. In the home interviews, I will talk to the parents and, examine the home environment to determine if there is a significant difference of both groups. The parents involvement or lack of involvement will be analyzed. The questionnaire and interviews will be evaluated to see if there is a significant difference in the parents attitude.

THE PROBLEM AND ITS SETTING

The Statement of the Problem

The nation's Hispanic population presently totals over 20 million. Since 1980, the Hispanic population has been growing at a rate five times as fast as the rate of the non-Hispanic population (U.S. Department of Commerce News, October 12, 1989). Estimates of the number of Limited English Proficient (LEP) persons living in the US are projected to increase to 40 million by the year 2000. (National Advisory Council on Bilingual Education). In the schools, the number of LEP students has increased nearly 100 percent in the past decade and is expected to continue.

In the U.S., 2.8 million elementary and secondary students in the US are limited English proficient (LEP). This number shows the urgent need for the education systems to continue to research ways of helping LEP students.

In the area of bilingual education, other problems surface. Less than 1 in 5 teachers who currently serve LEP students is certified to teach. (Office of Bilingual Education and Minority Affairs -US Department of Education, 1996).

The majority of parents support the Bilingual Education Act which gives students who are LEP (Limited English Proficient) the option of attending a bilingual class. Other parents have questions about the bilingual classroom, and therefore decide not to place their child in a bilingual classroom. "Adaptations for Special Populations". (Title 19, part II Texas Administrative Code and

Statutory Citations chapter 89 subchapter A).

Purpose of the Study

The purpose of this study is to examine two groups of bilingual children one in a bilingual class (SBE) and the other in a regular class (SRC). The parents of both groups are Spanish speaking and have different ideas concerning bilingual education. Using the information given by parents in the survey and in the interviews, will lead to new insights and will help teachers and administrators improve the success of (LEP) students.

Through research, a few problems have been highlighted. A growing number of Hispanics prefer their children to be placed in an all-English classroom for different reasons. Some of the reasons will be explored.

The Subproblems

The first subproblem. The first subproblem is the great controversy in regard to bilingual education. Many parents of non-English speaking children are beginning to question bilingual education. According to The Washington Times, the public's opinion has been changing, (Hispanics prefer English, poll finds, 1996). In this article the poll, conducted in English and Spanish via telephone, reported 81% of the respondents wanted their child's academic courses to be taught in English. In California, the Orange Unified School District has voted to eliminate bilingual education. This school district became the largest school system to win permission to drop traditional bilingual education (Los Angeles Times (1997). Many parents are pessimistic about bilingual education. To assess parental attitudes toward bilingual education the survey in this research asked "Why did you place or not place your child in a bilingual program?"

Another recurring theme arises in regard to bilingual children and the level of the parents involvement, especially the Hispanic non-English speaking parents.

The second subproblem. Over the last thirty years, a vast amount of literature has emerged documenting the relationship between children's homes and their school achievement. Children's experiences at home profoundly influence their chances for success at school. (Hess, 1984) Various commentators have suggested that culturally and economically marginalized groups feel unwelcome at school, and therefore, make few efforts to establish contacts or respond to invitations from the school. (Lareau, 1989) In this research, a questionnaire and a personal interview will examine the level of parental involvement or lack of involvement in the schools and in other educational activities

i.e. visits to museums and home activities.

Data Collection

Data for the bilingual students in a bilingual classroom was collected in the Dallas Public School. DISD currently has a student population of 149,466 students. Out of the total student population, 64,966 (43.47%) are Hispanic, 63,487 (42.48%) are African-American, 17,861 (11.95%) are Anglo, 2,455 (1.64%) are Asian, and 696 (.47%) are American Indian. (See exhibit I) The LEP population totals 45,000 and of these 45,000 students, 42,978 are Hispanic LEP. (DISD, 1995)

Both elementary schools chosen for this research had over 90 % Hispanic students, and both were located in predominantly Hispanic neighborhoods. The first school where the students in bilingual education were chosen has received numerous awards including Effective School 95-96, Outstanding School Chapter 1 Recognized, and Title 1 Honored School. The second school was chosen for its location and the percentage of its Hispanic population. Due to time constraints, only 10 subjects were chosen. Five were from bilingual education and five were from regular education.

Permission was received from third grade teachers to send home a note in Spanish asking for the parents' permission to visit them at their home. Five (5) of the children were selected. The children were observed in class during different times of the day. The principals for both groups in collaboration with the classroom teachers provided access to the students' records. The LPAC (Language Proficiency Assessment Committee) chairperson in the second school helped to identify the (5) children in a regular classroom. This second group of children qualified to be in a bilingual classroom, but the parents did not approve placement to special language programs. Therefore, they were assigned to a regular classroom.

This research will look at both groups' ITBS (Iowa Test of Basic Skills) test. The students in the bilingual classroom were given the Woodcock Munoz Language Skills. If the students scored a four (4) or higher then that student was able to take the ITBS exam. A score of 4 and higher on the Woodcock Munoz demonstrates that the student is proficient enough to take the English ITBS. The bilingual students who scored a 4 or less were given the SABE (Spanish Assessment of Basic Skills). In this sample, five students in bilingual education (SBE) had taken the ITBS. This research will use the test scores of both groups, the students in the bilingual education (SBE), and the students in the regular classroom (SRC), to see if a significant difference in both groups test scores was determined.

A Spanish questionnaire was developed. The questionnaire included 39

questions ranging from educational backgrounds to preferences in Television programs. Also, a structured and unstructured interview was developed. The interviews were held at the residence of the students. Parents and students contributed to the interviews. (See exhibit II)

Data Analysis

After reviewing the ITBS scores for both groups, the following was found. The bilingual students in a bilingual classroom scored at grade level on the ITBS. The five children chosen for this research had scores in reading of 2.9, 3.4, 3.4, 4.0, and 3.3. In these scores, the first number represents the grade level and the second, the month of the school year. For example, a 2.9 would mean that the student was at a level equivalent to second grade and nine months.

The bilingual group during group reading was observed and field notes were taken. All students (except for one student who had just arrived from Mexico) read in English and Spanish. Their reading comprehension was tested on a multiple choice handout. The five children used for this research were observed and interviewed. The children in the bilingual classroom were instructed in Spanish for Science and Math. The teacher instructed approximately 60% of the time in English and 40 % of the time in Spanish.

In the bilingual classroom, while most of the math was taught in Spanish, the students were able to transfer the information into English. The students were observed while they were working on a math worksheet in Spanish and when they had questions or doubts they would read the same problem in English. The proficiency in math was also shown on their ITBS exams where the students took the test in English even though they were taught in Spanish. The math scores showed 3.8, 3.5, 3.3, 5.6, and 3.8.

According to some researchers, bilingual students in a bilingual classroom taught in their native language, are able to transfer the content. Lindholm, K (1992) This is illustrated by these students.

These students in the bilingual classroom (SBE) demonstrated confidence in their work. At one point, the student who was a recent arrival from Mexico had a question on his reading worksheet, and the student next to him would translate to him with no difficulties.

In my questionnaire the five (5) parents who have their children in bilingual education were born in Mexico. One of the questions was "why did you place or not place your child in bilingual education?" They replied that the main reason is that they do not want their children to forget their native language. These parents do not speak English; therefore, they are afraid that if the child forgets their native language, then the only source of communication will be broken.1(Wong, 1991).

In my second group (SRC) the (5) parents who have their children in a regular classroom, gave different reasons for not placing their child in a bilingual classroom. Three (3) out of the five children of this group had a mother or father who was born in the United States. Two of the parents shared with me during the interview that when they were in school they were punished if they spoke Spanish in the classroom. One of them shared the story of being hit on the hand with a ruler when he spoke Spanish. Therefore, they did not want their child to experience the same humiliation they experienced.

Two (2) of the remaining parents in this group, answered that they wanted their children to learn English since they lived in an English speaking society. A question was asked if they believed Spanish was also as important and the answer was no. (Lambert, 1990)

A third significant finding was in regard to the parents' expectations. When the parents of the bilingual children in the bilingual classroom(SBE) were asked what their plans were for their children, all five survey respondents had no concrete answer for this question. They did not have any idea what the plans or goals were for their children. Four out of the 5 parents were prompted on the open ended question. They were asked if they wanted or planned for their child to finish high school, college, etc.

In contrast the second group, parents of bilingual children in a regular classroom (SRC), answered that their goals or plans for their children were to finish high school and to go to college. Their response was immediate without hesitation. One of the parents affirmed that she would like for her son to become an attorney or a doctor.

During my personal interview with the parents some of the interviews were taped and field notes were taken during others.

Another significant finding in the questionnaire was that 7 out of 10 parents in the bilingual classroom(SBE) and in the regular classroom (SRC) did not attend meetings with teachers and principals. The question was "Have you participated or attended PTA meetings?". In the bilingual group, 3 out of 5 replied that since they did not speak English, they did not understand what was discussed at the meeting. One of the respondents mentioned that she had once attended a PTA meeting, and unfortunately, did not understand what was being discussed. Delgado-Gaitan,(1989)

Another question in the survey asked the parents of both groups if they knew where the nearest library was located. If they knew where it was located, then they were asked approximately how often they visited the library. Nine out of 10 parents indicated that they did not know where the nearest library was located. Only one (1) parent whose child is in a regular classroom (SRC) indicated that they visited the library once or twice a month. Another finding in the questionnaire was that parents and students in the bilin-

gual class (SBC) viewed more Spanish television than parents and students in regular classrooms (SRC).

The Limitations

Some obstacles were encountered in this research. Due to the limited amount of time for this research, only 10 subjects were chosen. In future research, a much larger sample would be chosen, and schools in different school districts would be chosen. A second limitation was the limited amount of time for the summer research. Many of the schools were near the end of their school year; therefore, not enough time was spent with the children. Also, some of the families were leaving for Mexico during the summer, and only one (1) day was spent interviewing them and answering the questionnaire. Other parents were home, and therefore, were visited more than once.

The Importance of the Study

The importance of the continuation of this study is to help find ways that teachers and principals can help (LEP) students become more successful in school. This research can help identify ways parents of LEP students can become involved. This type of research can also help teachers and administrators understand more of the parents' backgrounds.

Recommendations

The following recommendations will be presented.

Having identified that parents' lack of involvement in PTA meetings is due to the fact that the meetings are in English, and there are no interpreters, a recommendation to administrators and members of the PTA would be to have someone translate the meetings. Possibly a volunteer could translate the minutes into Spanish and then send them home with the children.

A second recommendation is to have as much information as possible translated into Spanish and sent home with the students. Brochures should cover all areas of education from informing parents that the GED (High School Diploma) is available to take in Spanish, to informing parents of what every paper they sign means.

Conclusion

In conclusion the findings in this research showed no major relationship between the children's test scores and their English fluency. On the parents'

questionnaires and interviews, a significant difference was found in regards to the parents expectations, involvement and overall ideas in regards to bilingual education.

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Questionario

El propósito de este cuestionario es para coleccionar información sobre sus niños/niñas que están en la escuela. La información que usted nos da es de mucha importancia y de antemano les agradezco.

Hombre _____ Mujer _____ Edad _____

Prefesión _____

Salario: \$10,000-20,000 _____

\$20,000-30,000 _____

\$30,000-40,000 _____

Dónde nacieron los padres? _____

Cuántos años tienen en este país? _____

Cuál fue el grado de la escuela en que terminaron los padres?

Primaria _____ Secundaria _____ Preparatoria _____

Cuántos hijos tienen? _____

Qué edad tienen los niños? _____

Su hijo/a ha perdido (reprobado) algún año escolar? _____

A qué edad empezó el niño/a la escuela? _____

Su niño/a estudió en México? _____

Cuales son los planes suyos (padres) para el futuro? _____

Cuales son los planes del futuro para su hijo/a? _____

- Cúales son las aspiraciones que usted tiene para su niño/a?
 Qué le gustaria que su hijo/a lograr(? _____ -
 Cuántos televisores tienen? _____
 Tienen computadora? _____
 Qué idioma hablan en casa? _____
 A dónde van durante las vacaciones? _____
 Cuántos libros tiene el niño/a en casa? _____
 Dónde los tiene? _____
 Dónde queda la biblioteca mas cercana? _____
 Toman alguna clase, por ejemplo clases de inglés o clases que ofrecen en la escuela de los niños? _____
 Por qué decidieron o no el programa bilingue? _____

Casi cada día	Una o dos veces por semana	Una o dos veces por mes	Varias veces por año	Nunca o casi nunca
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1. Entre hermanos hablan ingles o español? _____
 A B C D E
2. Cuando hablan entre hermanos en ingles es :
 A B C D E
3. Qué programas de television ven mas español__ inglés__
 A B C D E
- 4.Cuál es el programa preferido en inglés? _____
 Qué tan seguido lo ven?
 A B C D E
5. Cual es el programa preferido en español? _____
 que tan seguido lo ven?
 A B C D E
6. Van al cine a ver películas en ingles o español? _____
 A B C D E
7. Cuales son los programas que más ven los padres? _____
 que tan seguido lo ven?
 A B C D E

8. Asisten a los museos de ciencia y otros museos? ____
A B C D E
9. Es su hijo/a miembro de algún club organizacion como deportes o ballet folklórico?_____
A B C D E
10. A dónde salen a pasear los fines de semana _____
A B C D E
11. Asisten a la biblioteca pública?_____
A B C D E
12. Con qué frecuencia hace lo siguiente
Leer a su hijo/a?
A B C D E
13. Su hijo/a le lee a usted?
A B C D E
14. Usted sabe qué es el PTA?_____
A B C D E
15. Ha participado en el PTA o en alguna organización similar?_____
Que tan seguido lo hacen?
A B C D E



The Effect of Encapsulated Creatine on Anaerobic Power Indices of Male Subjects

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ABSTRACT

The purpose of this experiment was to evaluate the effects of an experimental slow release encapsulated form of creatine monohydrate (Cr. H₂O) on anaerobic power indices in male subjects. Sixteen volunteer male subjects, 24.8 ± 5.0 years of age and weight, 179.0 ± 33.9 lbs., participated in this double blind study. During session one, subjects performed two 30 second Wingate Anaerobic Power Tests (WAPT) (Pre 1 and Pre 2) on a Monark cycle ergometer (model # 668) connected to a SMI photo-optic sensor and computer interface. Eight subjects were given a Cr. H₂O supplement (20g/day) and eight given a placebo for one week. The subjects were retested one week later in the same format as session one (Post 1 and Post 2). Anaerobic capacity (ANC), fatigue index (FI), and peak power (PP) were measured for the creatine and placebo groups. A doubly RM MANOVA ($p < 0.05$) was significant for treatment, time, and time x treatment. Univariate tests for dependent variables ($p < 0.05$) showed significance for PP only. Tukey post hoc analysis found no significant difference between Pre 1 and Post 1, and Pre 2 and Post 2 WAPT's. It was concluded that 7 days of slow-release supplementation did not show significant increases in PP, ANC, and FI.

Introduction

There are three main energy systems used by the human body; the adenosine triphosphate- phosphocreatine (ATP-PC), the anaerobic glycolytic and oxidative. The three systems are interrelated; however, the ATP- PC system was the main focus of this study. The ATP-PC system provides quick explosive power for short duration, high intensity exercise. The rapid depletion of intramuscular creatine phosphate (Cp) stores is thought to contribute to muscular fatigue and declining performance (1). There is a linear relationship between the decrease in Cp levels, fatigue, and peak power (5). In theory, excess Cp would result in a smaller decline in power throughout an anaerobic power test. There are several forms of creatine available, but creatine monohydrate (Cr. H₂O) is the form shown to be effective (2, 3, 4, 5). In a study performed by Greenhaff et al. (3), creatine monohydrate supplementation resulted in a significantly reduced decline in peak muscle torque during repeated bouts of high intensity exercise. Similarly, Earnest et al., (2) found that creatine supplementation in male subjects resulted in significantly increased anaerobic power during a 30 second Wingate anaerobic power test (WAPT). Cooke et al. (1), however, found no evidence to support the idea that Cr. H₂O would have a positive impact on continuous high intensity exercise in untrained males.

Harris et al. (4), concluded that 5-7 days of 20 grams/day oral Cr. H₂O supplementation was capable of increasing the total creatine content of skeletal muscle by 20- 50%. Since that study, there have been no studies published concerning the appropriate procedures to maximize muscle Cr. H₂O uptake in humans. The most widely used form of Cr. H₂O is in granular form that is mixed with water or juice. There is now an experimental form of Cr. H₂O, in the form of a timed-release capsule. The rationale behind the encapsulated form is that it allows a slower, more constant muscular uptake of Cr. H₂O. It is hypothesized that this new form of Cr. H₂O will provide positive effects on peak power (PP), anaerobic capacity (ANC) and fatigue index (FI) in male subjects.

Purpose

The purpose of this experiment was to evaluate the effect of an experimental, slow release encapsulated form of creatine monohydrate on peak power (PP), anaerobic capacity (ANC) and fatigue index (FI) in male subjects.

Methods

Subjects:

Sixteen male subjects, 24.8 ± 5.0 years of age and weight, 179.0 ± 33.9 lbs, currently enrolled in weight training classes at the University of Texas at Arlington volunteered to participate in this study. The subjects read and signed consent forms prior to participation. Subjects were screened for signs and symptoms of coronary artery, or other disease, and cleared for maximal exercise testing without a physician in attendance. Subjects were free from Cr. H₂O use within the past six months.

Equipment:

The Wingate anaerobic power test (WAPT) protocols were conducted on a Monark cycle ergometer (model # 668) utilizing a SMI photo-optic sensor and interfaced with a 486-DX66 personal computer. A Sports Medicine Industries software package was used for calculation and recording of PP, FI and mean power during both pretest and posttest.

Protocol:

All 16 subjects performed the anaerobic power test, which consisted of two 30 second Wingate supramaximal exercise protocols (Pre 1, Pre 2) separated by 5 minutes of rest. In a double blind fashion, six subjects were given the encapsulated Cr. H₂O, 20g/day, while the remaining six took a placebo. After seven days of Cr. H₂O or placebo supplementation, the subjects returned

to the lab to complete the testing using the same procedure as for trial one (Post 1, Post 2). Mean power and PP were measured during each WAPT. Anaerobic capacity and fatigue index were calculated as follows:

$$\text{ANC} = [\text{mean power} \times 30\text{s}] \times 1.002 \text{ kJ}$$

$$\text{FI} = \frac{\text{PP} - \text{minimum power}}{\text{PP}} \times 100$$

Statistical Analysis

Means \pm SD were determined for peak power (PP), anaerobic capacity (ANC) and fatigue index (FI) for the Cr. H2O and placebo groups. SPSS for Windows, version 6.13, was utilized for data analysis. Differences for time (pre vs. post), treatment, and time \times treatment were examined using a doubly RM MANOVA ($p < 0.05$). Univariate tests ($p < 0.05$) for the dependent variables, ANC, PP, and FI, were performed for significant F values. Tukey *post hoc* analyses were used when significant F values were obtained for the dependent variables.

Results

Means and standard deviations for ANC, PP and FI are outlined in Table 1. There was evidence of a significant main effect for treatment (Wilks's lambda = .54,

$F(3,12) = 3.37, p < 0.05$). A significant effect was also found for time ($p < 0.01$) but not time \times treatment. Mauchly's test revealed non-sphericity; therefore, the Greenhouse-Geisser procedure was used to adjust the degrees of freedom. Following the Greenhouse-Geisser adjustment, a significant effect was found for time (Wilks's lambda = .36,

$F(9,98) = 5.59, p < 0.0001$) and time \times treatment (Wilks's lambda = .60, $F(9,98) = 2.53, p < 0.01$). Univariate tests for dependent variables (ANC, PP, and FI) using the Greenhouse-Geisser adjustment, were significant for time ($F(2, 27) = 11.33, p < 0.001$), treatment ($F(1,14) = 7.87, p < 0.014$) and time \times treatment ($F(2, 27) = 6.18, p < 0.01$) for PP only. Mean PP values are depicted in Figure 1.

Table 1. Means and standard deviations for ANC, FI, and PP for pre and post supplementation for 30-s WAPT in male subjects. Pre and post -supplementation values indicate first and second WAPT order.

ANAEROBIC INDICIES	Experimental Condition			
	Pre #1	Post #1	Pre #2	Post #2
ANAEROBIC CAP.	18.19 \pm 2.6	18.83 \pm 2.2	15.99 \pm 3.3	16.64 \pm 3.5
FATIGUE INDEX	42.50 \pm 10.3	44.88 \pm 6.3	52.00 \pm 17.8	48.25 \pm 14.6
PEAK POWER	794.63 \pm 161.2	846.75 \pm 131.2	711.13 \pm 129.5	779.63 \pm 146.1

		Placebo		
ANAEROBIC CAP.	20.39 ± 3.8	20.55 ± 3.6	19.14 ± 3.8	19.44 ± 3.5
FATIGUE INDEX	39.06 ± 6.6	34.83 ± 9.5	40.20 ± 7.6	37.42 ± 8.4
PEAK POWER	611.53 ± 139.9	597.52 ± 161.3	580.02 ± 126.0	579.78 ± 120.6

A 2 x RM ANOVA using a split plot design for PP showed a significant treatment effect between groups ($F(1, 14) = 7.87, p < 0.01$). Peak power ($F(3,14) = 11.33, p < 0.00001$) and PP x group interaction ($F(3,42) = 6.18, p < 0.001$) was also significant. Since PP x group interaction was significant, simple effects were examined using a RM ANOVA. Combined PP data for both the creatine and placebo groups across the 4 WAPT's, was found to be significant ($F(3,45) = 8.42, p < 0.0001$). A Tukey *post-hoc* analysis ($p < 0.05$) showed significant differences between conditions pre #1 and pre #2, and pre #2 and post #1.

Discussion

The purpose of this study was to evaluate the effects of an experimental, slow release form of creatine monohydrate (Cr. H₂O) on anaerobic indices in male subjects. Based on the results of this study, the time released Cr. H₂O was not effective in increasing PP, as no difference was seen between Pre 1 and Post 1, and Pre 2 and Post 2 values, which would be expected if creatine was effective. The indices of ANC and FI were not found to be significant for any test conditions.

The data, appeared to follow a cubic rather than a linear trend; therefore, a linear model was inappropriate for statistical analysis. Criteria for sphericity were not met and due to the small sample size ($n=16$), adjustments for sphericity could not be made. A larger subject pool is recommended to enhance the ability to handle issues of nonsphericity.

Future directions for this novel and new supplement would be to include laboratory measurement of Cr. H₂O levels both in muscle (biopsy) and plasma as well as urine excretory levels. Since this formulation is slow-release, there exists a need to evaluate the effective loading dose. This would demonstrate whether muscle creatine levels had increased sufficiently to yield increases in PP throughout the 7 day supplementation period. A final direction would be to investigate the length of time it takes for the supplement to be fully absorbed (rate) by the muscle or rendered useless due to the digestive process (intestinal Cr. H₂O measurement).

Again, the experimental, slow-release encapsulated form of creatine monohydrate did not increase PP, FI or ANC which has been demonstrated by other studies (2, 3, 4, 5) utilizing the granular form. This supplement needs more laboratory testing to evaluate its effects on human subjects.

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Absolutism and State Formation in Early Modern Europe

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Abstract

Historians analyzing the formation of the modern state generally agree that the period known as the "Age of Absolutism" was crucial. Theories on Absolutism have been put forth by thinkers such as Karl Marx, Max Weber, Perry Anderson, and Charles Tilly. A consensus can be found within their works which tends to view state formation as a process directly related to the transformation of the European economy of the same time period. The models of state formation put forth by these authors have recently been revised by a number of historians. The central issue revolves around the search for the motivations which led European states to take on increasingly centralized, rationalized and legalized structures as opposed to retaining strictly traditional systems based on dispersed feudal and customary rule. The expected outcome of this project is to deepen our understanding of the ways in which the evolution of the state was influenced by the wider economic and social development of Europe in the early modern period.

The debate over the origins of the modern state usually focuses on the period generally known as the "Age of Absolutism." Many historians regard this as a period of transition from a purely feudal society based on coercive interpersonal relations into a capitalist society in which functions were then carried out in a more systematic and bureaucratic manner. Various theories regarding the significance of this transitional period have been put forth by thinkers such as Karl Marx, Perry Anderson, Charles Tilly and Max Weber. A consensus can be found within their works which tends to view state formation as a process directly related to the transformation of the European economy of the same time period. Those authors focus on the necessarily coercive aspects required in molding the forms of the state to meet the noticeably emerging economic change. Recent scholarship by Nicholas Henshall, William Beik and James B. Collins has, however, challenged, supported, and/or revised this approach. Henshall, for example, follows a line which stresses not conflict but cooperation and personal clientage relations. In his view, the process of state building can be seen as one of personal influence overriding the factors of fundamental economic necessity. An overview of these authors' works will help us better understand their contributions to the ongoing search for the foundations and meanings of early state development in the "age of absolutism."

In the nineteenth century, Karl Marx developed theories which have proved very useful in assessing the nature of the modern state. Marxist theory stresses

that the formulations of the state are given their specific structure in accordance with the necessities of the ruling class. The specific necessities, in turn, are according to this class relationship to the economic foundation. One way in which these necessities are secured is through the foundation of a precise juridical mechanism which is tuned to the requirements of the ruling class. As noted in the Communist Manifesto, this “jurisprudence” represents the will of one class “made into a law for all, a will whose essential character and direction are determined by the economical conditions of existence” of the ruling class (338). In this way, economically superior sectors of the population were able to “fortify their already acquired status by subjecting society at large to their conditions of appropriation” (332).

In the transitional period of absolutism, argued Marx, many of these conditions were gradually realized, but only after a certain amount of bargaining between the monarchy and nascent middle class had taken place. From the king’s position, there was the traditional desire for the expansion of power, but this proved to be a finite commodity. An antagonism existed between the king and the nobility in regards to the distribution of this power. If the king desired a larger influence in the wielding of power, it was necessary that he remove it from the ranks which held it. A base of support would enable the king to proceed with this centralization, and this is where Marx sees the bourgeoisie as serving the “absolute monarchy as a counterpoise against the nobility, and, in fact, cornerstone of the great monarchies in general” (323). The nascent middle class receives protection and stability in order to expand its markets, while the king, in turn, is provided with liquid wealth. These funds are then channeled into structures which would enable the king to proceed with the extraction of power and wealth from the traditional elites within society.

The feudal forms of rule gradually underwent an inevitable process of dissolution, resulting in novel or redefined structures and functions of the state. Marx argues that the centralized state power, with its standing army, police, bureaucracy, clergy and judiciary, originates from the days of the absolute monarchy. These new attributes of the monarchy make this period extremely important for the foundation of the modern state. During this period, feudal coercion of the peasantry — based on the aristocrat’s position as a powerfully significant actor on the local level — was replaced with absolutist coercion by the crown, based on its redefined and strengthened position of rule. The emerging bourgeoisie, which provided the basis for the strengthened monarchy through its dominant hold over liquid wealth, was simultaneously able to consolidate its position against that of the traditionally dominant landed elite. According to Marx, state regulation in such areas as mercantilism and manufacturing helped this class secure some of the necessities which would eventually place it in the role as the dominant ruling class within the modern state.

In 1974, Historian Perry Anderson, returned to this issue in his work entitled Lineages of the Absolutist State takes a similar stance towards absolutism as a transitional period, but a significant difference between Marxist theory and that of Anderson is found in the different roles that Anderson envisions for both the bourgeoisie and the landed elite. According to Anderson, the absolutist state should not be seen as “an arbiter between the aristocracy and the bourgeoisie, still less an instrument of the nascent bourgeoisie against the aristocracy” (18). Anderson still focuses on the Marxist tradition of conflict as a process of change in his depiction of the absolute state as “a redeployed and recharged apparatus of feudal domination, designed to clamp the peasant masses back to their traditional social position” (18). With the decline of certain aspects of feudal rule, such as the “gradual disappearance of serfdom,” the feudal nobility found it increasingly necessary to seek out more effective modes of domination. These new modes took the form of a “centripetal dictatorship exercised under the royal ensign” (53). Politico-legal coercion converged in a concentrated form within the centralized state. Absolutism, therefore had the effect of increasing “the efficacy of aristocratic rule in pinning down a non-servile peasantry into new forms of dependence and exploitation” (20). The forms of this centralized feudal domination were, Anderson allows, influenced by the expansion of “commodity production and exchange.” This economic expansion helped mold the “contours of aristocratic class power in the new age” (23-24). For example, the state’s military and political strength was very dependent upon the size of the commodity sector. It would therefore be of significant advantage to the state if, through its augmentation of aristocratic rule, it could “simultaneously ensure the basic interests of the nascent mercantile and manufacturing classes” (40).

An important aspect in these transitional developments, said Anderson, was the increased utilization of certain sectors of ancient Roman law. Roman law incorporated notions of unconditional private property, which promoted exchange while at the same time, its emphasis on the monarch as above the law “consolidated the concentration of aristocratic class power in a centralized state” (27). So the primary factor which influenced the acceptance of Roman law is found in the desire for increased central power. Although individual aristocrats lost independent political rights because of this increased centralization, they “registered economic gains in ownership” (20). The acceptance of Roman law laid a strong basis for the growth of “formal rationality...of the legal systems of early modern Europe” (29). The absolutist state which emerged was one which reconverted the feudal elite to the “necessary form of its own political power...the late feudal aristocracy was obliged to abandon old traditions and acquire many new skills” (48).

A more recent study on the development and nature of state structures

was undertaken by social scientist Charles Tilly in his work entitled Coercion, Capital and European States, AD 990-1990. Although not a Marxist, Tilly recognizes the linkage between state formation and economic development. He focuses on the importance of urban areas and argues that the possibilities for state formation were profoundly influenced by the presence of cities that served as points for capital accumulation and distribution. A state's relations with urban areas affected its access to "capital, credit, and control over hinterlands" (51). States were dependent on urban centers "for the financial means to recruit and sustain armed force" (59). The threat of territorial depredations required that states develop their potential for the recruitment of armed forces. In consequence, the "extraction and struggle over the means of war created the central organizational structures of states" (57). These structures allowed the state the necessary funds which enabled it to specialize in coercion, while at the same time, they offered protective devices for securing the development of economic activity. A thriving economic situation provided the state with a secure source of revenue which could then be collected through a variety of taxes and customs charges. "States having access to a combination of large rural populations, capitalists, and relatively commercialized economies won out" (58), for they held the advantages when it came to the "rapid mobilization of capital for expensive wars" (62).

The realization of the potential for a concentration of coercion led states to increasingly seek the limitation of independent coercive bodies within its patrimony. In order to limit the possibilities that coercive forces could unite in resistance to royal demands, monarchs moved toward "monopolies of the larger concentrations of coercive means within their territories: armies, police forces, weapons, prisons and courts" (54).

These coercive structures not only increased the state's authority over its own territory and population, but the structures also increased the possibility of an independent status within the European system as well. The forms that it took allowed the emerging economic system to legally ensure a strengthened position, and it was through this economic strength that states gained ascendancy and legitimacy within the European system as a whole.

Tilly's definition of states as "relatively centralized, differentiated, and autonomous organizations successfully claiming priority in the use of force within large contiguous and clearly bounded territories" echoes the definition found in the earlier work of Max Weber, a nineteenth-century German sociologist. Weber systematically lays out the development of state formation in clearly definable phases. He sees absolutism as still rooted in the earlier stage of patrimonialism, but believes that it was nevertheless in a clear transition to a more modern state. A patrimonial state is by nature a very personalized ruling system which is centered on the king's household administration, and which

therefore includes a definite intermingling of court life and governmental functions. Within this type of system, there are no clearly defined distinctions of duties undertaken by the various officials. While the absolutist state did function through its basis in patrimonialism, there is a noticeable evolution of particular state structures. Weber considers this evolution as a process of "rationalization." In other words, it is a process of legalizing and defining the methods by which a state conducts its rule and extracts resources from its own population. In rationalizing and ordering the state according to defined rules and law, the state is simultaneously aiding the development of economic order. Early capitalist development is able to ground its survival in the increasingly centralized and rationalized order of the state. As the state gradually conforms itself to a more legal and impersonal structure, the system becomes more predictable, and it is this predictability and calculation that provides the basis for the growth of capitalism, and thereby the transition to the modern state (Giddens, 154-163, 178-184).

It should be clear, then, from the study of the above works, that the absolute state was neither a purely feudal nor modern institution. Despite some discrepancies in their arguments, the authors agree that its significance lies in its being an intermediate and transitional phase between two clearly definable political-economic systems. It should also be clear that the process driving this political change is the transformation of the underlying economic conditions that was occurring during this time period. Recent scholarship has challenged or refined this perception of the absolute state. Whereas some authors have been more definite than others in calling for a new focus, other authors such as William Beik in Absolutism and Society in Seventeenth-century France (1986), have been less inclined to demolish the Marxist interpretation of the early modern state. Following Anderson's lead, Beik proposes that absolutism should be understood as a type of feudalism, and argues that attempts to define absolutism "as a modern state grafted onto a pre-modern society" (339) should be resisted. Absolutism, similar to purely feudal forms, was also a system based on "extra-economic coercion" (30). The aristocracy's social and economic need to dominate the peasantry led it to seek or at least welcome the construction of a royal system which would legally "maintain privilege and inequality" (337), and which would allow them "ownership over the various social advantages and different claims on the wealth produced by the masses of peasants" (32). As a political system guarding the interests of the privileged elite, the royal state was able to guarantee this class a significant level of "unearned revenues and a share of various forms of political influence" (331). This demonstrates a very Marxist attitude that Beik has taken, as this groups' relation to resources such as "unearned revenues" helps to place it in the confines of its own economic class. Beik defines classes as "groups whose social and

economic interests are necessarily antagonistic to one another because of their differing relationships to resources [and] power" (7). Antagonistic relations are found between a privileged class, which extracts these "unearned revenues," and an exploited peasantry, which is legally confined within a system of inequality.

This system was not independent of the monarchy; rather, it required a close collaboration with the crown in order to ensure that inequality "was built into the system" (336). In order for the ruling class to exercise legitimate power they relied on "a higher organism which could justify their existence and protect their system of domination" (337). In France, Louis XIV's success in reinforcing the hierarchy "of the privileged to their share of society's resources" (334) led this class to "place its fate more than ever in the hands of the monarchy...Local power was still important, but it could only be exercised within parameters established at Versailles" (338).

Beik clearly finds it unnecessary to break with the more orthodox versions of the essential workings and nature of the absolutist state. Nicholas Henshall, on the other hand, has more recently offered a very clear departure from the focus on the economic underpinnings of state development. In his work entitled The Myth of Absolutism (1992), Henshall specifically states his preferred focus for studies of this time period: "Many historians...have investigated the socioeconomic basis of 'absolutism' when they should have explored the vagaries of high politics and personalities" (173). The picture of "high politics" involved officials who were not so interested in the content of their political conflicts, but who instead chose their conflicts as a way of "capturing the attention of the monarch and winning his favour" (64). The effect of this royal favor was the enhancement of an intricate network of patronage, which Henshall characterizes as "a Mafia with tentacles extending to the remotest parts of the realm...The result was government by personal relationships" (26). So, rather than looking for the economic foundation as a component of change, historians should seek out the underlying intrigue, bargaining and personal whims that motivated state development. In fact, Henshall sees no significant difference between the French state of the 16th century and that of the 18th century.

The fact that the monarch relied on personal relations and cooperation in running the system leads Henshall to conclude that the king should therefore not be viewed as a purely absolutist figure. The connotations of the term absolutism lead many to assume that monarchs such as Louis XIV "promoted a monopoly of power for himself" and that this led to "the decline of corporate bodies as government agencies and organs of consultation" (35). If absolutism is a system which is thought to marginalize corporate institutions, then the status of absolutism in France is "a problematic concept" (58). As a very powerful monarch, Louis required the backing of strong agencies in order to fur-

ther extend his own authority, therefore, these institutions “existed not to obstruct the extension of royal power but to legitimate it” (181).

In some specific areas, absolute authority was necessary, but this did not detract from the kingdom’s “liberty,” in fact, a powerful king was better able to defend his “subjects” against other monarchs. This makes it beneficial to allow the king his own defined authority, for in this way subjects sustaining a powerful king are more “secure in their liberty and property” (128). The elements which define the role of the monarch during this time period are that most were “absolute when they wielded their sweeping prerogatives and limited when they negotiated over their subjects rights” (3), and it is clear to Henshall that the kings “greatest prerogative was the distribution of patronage” (154). According to him, the authority of the monarch as well as the influence of various institutions was dependent on how well they could play the game of patronage and thereby influence the formation of the state.

The most recent study of Absolutism, one which challenges the tendency of focusing too narrowly on either the socioeconomic or the personal political workings of the state, is written by James B. Collins. In The State in Early Modern France (1995), Collins offers more of a non-ideological and middle-of-the-road approach to the subject of state building. He rejects the notion that the absolute state was merely an institution which represented “a strengthened final stage of the feudal monarchy” (2). He instead notes that the state “had to consider interests broader than those of the feudal nobles” (2). The feudal elite did retain its prominent position, but it was eventually forced to exist parallel to, as well as within, a growing government administration, but “the creation of this new layer of administration did not mean the abolition of old ones” (109). The state “exponentially increased” many traditional state structures, thereby giving the monarch a larger mechanism with which to “intervene regularly in everyday life” (22). In this way, the state relied on many of its traditional figures; therefore, the belief that officers were replaced by commissioners should be revised. Collins emphasizes that, “intendants were not used to establish an ‘absolute’ government...they did not allow him to move outside the structures of the social order” (54), but they did represent a fundamental change by the fact that they existed “outside the realm of contract, and purely in that of law” (54). Still, the extension of legal order “remained severely limited by the traditional restrictions” (113).

This traditional hinderance to the development of a rational legal order includes the sometimes fragile system of patron-client relations. This system stems from the traditionally personal feudal ties between the monarch and nobility. Though usually helpful in this transitional period, these ties did not offer the security of a more legally defined system of relations. This fact of instability was noted by Louis himself when he decided that he could not

appoint a new commander to a "certain regiment because all of its officers were either relatives or clients of its current commander...the entire officer corps of the regiment would resign" (94). It was through the effort of balancing these "contradictory elements" that the monarch "created the prototype of the modern state" (4). The early modern state was not, according to Collins, a result of the monarch aligning with one sector of the population in opposition to another. Collaboration is a key factor in determining the process by which the state elaborated and defined its specific functions, functions which were influenced by both socio-economic as well as more personal and political aspects of society.

The search for the underlying factors of why the state developed the specific functions that it gradually did during this transitional period has been conducted from many ideological positions. What were the most important motivations which led the state to take on an increasingly centralized, rationalized and legalized structure as opposed to retaining a strictly traditional system based on dispersed feudal and customary rule? Many answers have been presented by the various authors, and some have been more convincing than others in developing a sound analysis. Collins has determined that "one's focus in statebuilding will, to a great extent, determine one's understanding of it" (2). Some authors have focused on the socio-economic aspects and some have emphasized the politics of patronage and personal relations, and it remains for others to review this historiography and determine what aspects present the more viable representation. For this particular review, it must be noted that the economic motivations for state formation present a clearer understanding. Though personal political motivations may play a role in swaying particular developments, these personal motivations should be seen as having their foundations in economic necessity. Personal inclinations are conceptualized through the context of underlying economic movement. As the economy changes, it requires the development of certain structures through which it may flourish. These structures are not those formed through so much intellectual or political calculation, rather, they stem from an inevitable historical process. Marx noted the fact that the consciousness of men, for example their political and social ideas, did not determine their being. It is instead "their social being that determines their consciousness." In other words, the position that an individual holds in the economy is the determining factor for that individual's subsequent reactions to historical conditions.

Of the three most recent studies which have been formulated, William Beik offers the more convincing platform, at least for this review. The state's functions derive overwhelmingly from the need to perpetuate the dominance of a traditionally privileged elite. The pressures of the economy push the state to incorporate and legalize the mechanisms which ensures this rule. The threat

that the state may use legally condoned force in ensuring the necessities of its ruling class places it in the position of a tool through which this class wields its authority. From this position, they may legally extract “unearned revenues” from the population which earns these revenues, and they may also retain their dominance — at least until further significant economic development requires further social and political development. Therefore, the state is fundamentally a body which has incorporated the methods for dealing with economic transformation and for legally defining the role that particular sectors of the population are to play in accordance with this economic functioning.

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The Greatest Battle

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Abstract

In this paper I will examine the war experiences of the eighteenth-century Englishwoman, Christian Davies, also known as Mother Ross, and the twentieth-century American woman, Josette Dermody Wingo. I will use their autobiographies as my primary sources: Davies's *Life and Entertaining Adventures of Mrs. Christian Davies (Commonly called MOTHER ROSS)*, and Dermody's *Mother Was A Gunner's Mate*. My secondary sources will include texts that relate information about an era in which these two women lived, attitudes toward women, the particular wars they each fought, and the important personages discussed by Davies and Dermody in their autobiographies.

The purpose of my study is to show that Davies and Dermody, as women in the military, each engaged in two wars rather than one. France was the foreign enemy Mrs. Davies fought as a foot soldier in the War of the Spanish Succession. Inside her own forces, her struggle was to hide her identity and masquerade as a man in order to participate in the war. The foreign enemy Josette Dermody Wingo fought as an anti-aircraft gunnery instructor was against the Axis powers in World War II. Inside her own forces, she struggled with the mistreatment, rude overtures, and lack of respect suffered by military women during World War II.

While Mrs. Davies could not reveal herself as a woman in the English forces in 1700 and had to completely disguise her gender, Dermody was one of the earliest women inducted into the United States Navy. I conclude that even though both women fighters were separated by many miles and many years, gender was the greatest battle they had to fight.

"To be sure, I don't know what our beloved country is coming to when we send our young ladies off to war."

The eighteenth-century English woman Mrs. Christian Davies and the twentieth-century American woman Josette Dermody [Wingo] describe in their autobiographies how they, as women in the military, must each engage two enemies rather than one. France was the foreign enemy that Davies fought as a foot soldier in the War of the Spanish Succession. Inside her own forces, her struggle was to hide her identity and masquerade as a man in order to participate in the war. The foreign enemy Dermody fought as an anti-aircraft gunnery instructor was against the Axis powers in World War II. Inside her own forces, she struggled with the mistreatment, rude overtures, and lack of respect suffered by military women during World War II. I conclude that even though both women fighters were separated by many miles and many years, gender was the greatest battle they had to fight.

In Davies's autobiography, *Life and Entertaining Adventures of Mrs. Chris-*

tian Davies (Commonly called MOTHER ROSS); Who, in several Campaigns Under King WILLIAM and the Late Duke of MARLBOROUGH, in the Quality of A Foot Soldier and Dragoon, Gave many signal Proofs of an unparallell'd COURAGE and personal Bravery., first published in 1740, she constructed herself as a brave, tough, determined, loyal woman who became a foot soldier in the War of the Spanish Succession. Davies's normal life was broken when a male suitor violated her womanhood. Davies was so distraught that she slipped into a deep depression. She eventually secured her mother's permission to leave home and went to Dublin to live with her aunt. Upon her aunt's death, Davies inherited her possessions, which included a public house. Although frowned upon by her culture, Davies fell in love and married one of her servants, Richard Welsh. They lived a typical life running the pub until Richard went to pay Alderman Forest for the beer that he supplied them. Richard never returned from the errand. Davies searched for him to no avail; in time, she assumed he was dead. Much later she was surprised to receive a letter from him. In the letter he explained the circumstances behind his sudden disappearance and mourned the fact that she had not responded to his eleven earlier letters. The twelfth letter repeats the account of his "sudden and unpremeditated" departure and the reasons for his having enlisted as a soldier in the War of the Spanish Succession:

It was my misfortune, when I went out to pay the alderman the 50*l.*, to meet Ensign C—m, who, having formerly been my schoolfellow, would accompany me to the alderman's house, from whence we went, at his request, and took a hearty bottle at the tavern, where he paid the reckoning; having got a little too much wine in my head, I was easily persuaded to go on board a vessel that carried recruits, and take a bowl of punch, which I did in the captain's cabin, where being pretty much intoxicated, I was not sensible of what was doing upon deck. In the interim, the wind sprang up fair, the captain set sail with what recruits were on board, and we had so quick a passage, that we reached Helvoet Sluys before I had recovered from the effects of liquor. It is impossible for me to paint the despair I was in, finding myself thus divided from my dear wife and children, landed on a strange shore, without money or friends to support me. I raved, tore my hair, and cursed my drunken folly, which had brought upon me this terrible misfortune, which I thought in vain to remedy by getting a ship to carry me back, but there was none to be found. The ensign, who possible did not intend me this injury, did all he could to comfort me, and advised me to make a virtue of necessity, and take on in some regiment. My being destitute and unknown, compelled me to follow his advice, though with the greatest reluctance, and I now am, though much against my inclination, a pri-

vate sentinel in Lord O—y's regiment of foot. (Davies 18-19)

The contents of this letter signaled the beginning of events that caused a transformation in the life of Christian Davies.

Davies's military career began the moment she went in search of her missing husband. Up until that moment, she lived the life of a typical eighteenth-century English woman of her class and economic status. Nevertheless, once she opted to search for her husband, she opened a new door—one that women in her time rarely entered. The search itself was not remarkable—many women had gone in search of their missing husbands—it was the manner in which Davies chose to conduct her search that was remarkable. She cut off her hair, dressed in one of her husband's suits—having quilted the waistcoat to prevent her breasts from injury—put on a wig she had prepared and bought a silver-hilted sword, and began her adventure masquerading as a man. In this disguise she offers her services to go up against the French in the War of the Spanish Succession and heads for Holland where she believes her husband is stationed.

The War of the Spanish Succession was concerned with who would succeed King Charles II as ruler of Spain. The English and Dutch had a special interest in the disposal of Charles's heritage. If his Empire fell under French domination, English commerce and manufacture and the Dutch shipping trade would be fatally injured. The Spaniards, having been incapable of conducting either industry or commerce for themselves, had allowed the English and Dutch merchants, thinly disguised under Spanish names, to carry on the trade between the English and her American colonies through the port of Cadiz. If French influence became supreme at Madrid all this would come to an end. Dutch and English merchants would be excluded in favor of their French rivals in every one of these great markets. The Mediterranean would be closed to their ships. And in addition to economic ruin, the national independence of England, based on her control of the narrow seas, would be seriously threatened by the French. Davies's primary reason for enlisting in this war was to find her husband (Trevelyan 486-500). However, once she had experienced the war first-hand, she took to fighting with a passion and became a brave and successful foot soldier in England's service.

In Dermody's autobiography, *Mother Was A Gunner's Mate*, published in 1994, she constructed herself as a young, naive, curious, caring, religious woman who wanted to play an active role in World War II. The War officially began on September 1, 1939, when Hitler invaded Poland; however, the United States tried to remain neutral. But on December 7, 1941, the Japanese bombed Pearl Harbor, killing more than 2400 sailors. The next day, President Roosevelt asked Congress for a declaration of War against Japan. On December 11, 1941, Germany and Italy declared war on the United States; the nation was now fully involved in World War II (Breen, et. al. 530-540).

World War II had a profound effect on American society. For the first time ever, women were abundantly flooding the work force. Before the war, the primary roles of women were homemaker and mother. That is, women were expected to find a husband, have babies, and take care of the home. The few women that chose to be independent and have careers outside the home were often frowned upon. However, once America engaged into the war, many women began assuming roles that ordinarily belonged to men. Suddenly, the propaganda machinery that had once discouraged women from competing with men for jobs urged them to enlist in the work force. The patriotic appeal had the desired effect. What faithful woman could sit at home when the media warned her that her father, husband, or brother in service might die for the lack of ammunition? (Davidson and Lytle 303-28). Thus, the wartime experience helped undermine the concept that a woman's place was in the home.

Women also found opportunities when the Navy opened its doors to them. Women could now join in the war effort and serve their country like men. Dermody's autobiography describes this new experience. Unlike Davies's reason for enlisting in the military, Dermody's reasons are not so clear cut. Throughout her text, she alludes to patriotism and escapism. In her prologue, she announces this uncertainty:

It's incredible that it was only a year ago I was home in Detroit working for Meekin Brothers Plumbing and Heating Supplies, worrying about withering on the vine. Sometimes I wonder myself what possessed me to run away to sea, why I joined the Navy-patriotism, of course, and adventure...and sometimes, I think, a great big hole in my head. (Dermody 4)

While patriotism seems primary, Dermody does not narrow her reasons for enlistment throughout her text. She suggests that escapism is also an important factor. For example, when Dermody is home on leave she speaks of her best friend Sheila, "I have to admit she looks good, her long civilian hair in a stylish upsweep, she looks businesslike as she answers the phone and writes down the message. It's funny-peculiar feeling to see her in my old job. No sweat. She can have it. I turn to go." (Dermody 7) At this point, Dermody suggests that she does not want to be the one stuck behind a desk in a dead-end job. She wants the adventure and excitement of military service.

While other reasons for Dermody's enlistment are present, by the end of her narrative it is clear that she wants to fight for her country and is angered that she must remain in the United States and train men to be gunner's mates who will get to fight the enemy abroad:

It just seems to be taking a long, long time, and it's harder than we ever thought it was going to be. So we do what we can, after all, we did enlist to help. Maybe if we are really strict and conscientious, keep the

DINGS going, maybe our guys could actually *hit something*. Sometimes I get so mad that I can't take a direct crack at those illegitimate sons of Satan my-self. No way for a lady, even the most patriotic of ladies to feel, I suppose they would say if they knew. (Dermody 113)

Dermody's major reason for enlistment is patriotism. She is not content to remain on the sidelines; she enlisted to fight, to rid the world of the "illegitimate sons of satan."

Although Davies's and Dermody's reasons for enlisting in the military were different, they both wanted to have a piece of the action. This determination to fight the enemy put them into conflict with their own forces. As women trying to make it in a man's world—war—their greatest struggle was the gender battle. Davies's gender battle led her to give detailed and lengthy descriptions of each battle she fought. One of numerous examples is her narration of the Battle of Landen:

At four the next morning the French advanced in good order, within cannon-shot of our intrenchments, that they might have time to raise their batteries; after which, the battle began at the village of Laar, with the left wing of our army, where a terrible slaughter was made. The foot, which were posted behind the intrenchments, suffered the enemy to advance very near to our cannon, and then firing upon them, covered the field with dead bodies, and swept down whole battalions which lay dead in the same ranks and order as they advanced. The French, notwithstanding, made two vigorous attacks, but did not get an inch of ground upon us, and their obstinacy only augmenting their loss, they gave over on hat side about eleven o'clock, but it was to begin again with equal violence with our right wing, which was posted at the village of Neerlanden. The enemy here met with the same reception, and being repulsed, they made so considerable a movement backwards. (Davies 24)

Her account of this battle goes on for another page. One possible reason for the extended accounts is that Davies wanted to make sure that her readers not only knew she was on the battle field, but right in the heart of the action. A simple spectator, or perhaps an ordinary woman of her times, would not have experienced the thrill of winning or known the intricate details of the battle, as she did.

The gender battle also led Davies to embellish some of her war stories. For example, in telling about a young lady who fell in love with her, she further evokes the image of the powerful male who is successful in the battles of the sexes:

I was in Gorcum, where my grief for my husband being drowned in the hopes of finding him, I indulged in the natural gaiety of my temper, and

lived very merrily. In my frolics, to kill time, I made my addresses to a burgher's daughter, who was young and very pretty. As I had formerly had a great many fine things said to myself, I was at no loss in the amorous dialect; I ran over all the tender nonsense (which I look upon as the lover's heavy cannon, as it does the greatest execution with raw girls) employed on such attacks; I squeezed her hand, whenever I could get an opportunity: sighed often, when in her company: looked foolishly, and practised upon her all the ridiculous airs which I had often laughed at, when they were used as snares against myself. When I afterwards reflected on this unjust way of amusement, I heartily repented it; for it had an effect I did not wish; the poor girl grew really fond of me, and uneasy when I was absent; for which she never failed chiding me if it was but for half a day. When I was with her, she always regaled me in the best manner she could, and nothing was too good or too dear to treat me with, if she could compass it; but notwithstanding a declared passion for me, I found her nicely virtuous; for when I pretended to take an indecent freedom with her, she told me, that she supposed her tenderness for me was become irksome, since I took a method to change it into hatred. It was true, that she did not scruple to own she loved me as her life, because she thought her inclination justifiable, as well as lawful; but then she loved her virtue better than she did her life. I had dishonourable designs upon her, I was not the man she loved; she was mistaken, and had found the ruffian, instead of the tender husband she hoped in me. (Davies 28)

One possible reason for the embellished stories is to make her masquerade more appealing to the reader. Davies's disguise is so good that she can even fool her own sex. Furthermore, the long descriptions and embellished stories drive home Davies's point —only as males can women successfully succeed in the military. Davies was able to succeed only because she initially masqueraded as a man.

Like Davies, Dermody wanted to get out into the action and fight. However, unlike Davies, Dermody never received the chance to see her war (World War II) first-hand. Because of the time in which Davies lived, it was easy for her to masquerade as a man in the military. However, because of Dermody's era, the option of deception is unavailable. Dermody is allowed to enter the military as a woman, but because she is a woman, she must overcome obstacles that military men do not encounter. For instance, she could not even join the military on her own; she had to get her father's permission and signature:

I can't believe that it's happening, that I am actually sworn into the U.S. Navy Women's Reserve, that Daddy signed his permission for me. He didn't have to sign for my brother Michael when he enlisted in the

Army two months after Pearl Harbor, but for some reason it's different for girls until you're 21. Anyway, Daddy did sign; I passed all the tests, written and physical; a rotund officer with a very short haircut swore me to defend the country against all enemies, foreign and domestic, I have my service number-766 73 28-and my bag is all packed. (Dermody 5)

She certainly could not pose as a man like Davies; she had to go through Military Entrance Processing where she was forced strip naked, receive a physical and submit to other tests. Dermody, one of the earliest women inducted into the Navy, had little control over her destiny as a fighter. After Boot Camp and Technical School she was assigned to a non-combatant post on Treasure Island, California, where she remained for the duration of the war training male sailors to become gunner's mates. In contrast to Davies who was able to jump right in and fight, Dermody had to be satisfied with the assignment the Navy gave her.

Although Davies and Dermody lived in different eras and different countries, the fighter within each woman had to find a way to win their greatest battle—the gender battle. For various reasons, they each felt a need to join the war effort. In doing so, they were treated differently because they were women. Davies and Dermody had to devise ways in which to deal with the gender issue. For Davies, she invented a whole new identity. While fighting against the French, Mrs. Davies was known as Christopher Welsh. In order to protect her guise she had to sacrifice her own femininity. For example, when she is accused of fathering a child she is forced to accept the accusation that can only be leveled at men:

I went into winter-quarters at the Boss, where a very odd adventure befel me. I went with two of my comrades to a house of civil recreation, where they made a bargain for, and retired with, such ware as they wanted, and I diverted myself with serenading them on the tongs and key. A lady of civil conversation, who was very big, happened to take a liking to me, and used all the common methods of those virtuous damsels to entice me; but finding they had no effect, she swore she would revenge the slight, which she soon after did, by swearing me the father of her child. Whether this was the effect of her revenge, or her judgment, as I made a better figure than any private dragoon in our regiment, and she thought me the best able to provide for her in her month, and to take care of her bastard, is what I won't take upon me to determine; but I was so surprised and enraged at the impudent perjury, that I was almost tempted to disprove her effectually, and give her up to the law; but, on a mature deliberation, I thought it better to defray the charge, and keep the child, which died in a month, and delivered

me from that expense, though it left me the reputation of being a father, till my sex was discovered. (Davies 38-39)

This absurd situation is somewhat ironic. An eighteenth-century man did not have to worry about the accusations of a woman of her stature. Nevertheless, Davies decided to allow the woman's allegation and claim the child. I believe that Davies did this because she felt threatened. She felt the need to protect her disguise, if she were to remain in the military. Davies told us that she was outraged by the accusation, but then said upon "mature deliberation" allowed the scam to go forth. Davies knew that if she disproved the fraud by revealing her gender she would no longer be treated as an equal, which later proved true. When Davies sex was discovered, she was relegated to the position of an army cook and became a sutler; she fed and liquored the troops.

Although Dermody was inducted into the military as a woman, she never received the chance to fight on the front lines. To alleviate some of her disappointment in the autobiography she creates metaphorical battles to replace actual ones. The far away "Big War" serves as backdrop for each of the "little battles" she constructs throughout her narrative. One example of the metaphorical battles is with her roommate Tolliver. This battle begins the first day the two women meet at Boot Camp:

I stop to get my breath at the door of apartment 5-D. A heavy-set girl with straw-like blonde hair pushes right by me and says, 'Dibs on the bottom bunk.' Doggone. Drat. Dibs is dibs. The other two bunks already have somebody's gear on them. 'Linen room, c'mon.' The blonde girl disappears and reappears with an armload of sheets and a blanket. She makes up her bunk and flops in one of the chairs, watching me as I flounder with the sheets on the top bunk. 'Catholic, eh?' She says it as though 'Cath' is three syllables. Ca-aa-th-o-lick. I feel for my specially blessed Miraculous Medal on the silver chain around my neck. 'Back where I come from, we don't give Catholics the time of day,' she continues. I can feel my face flaming. I can't breathe. What should I say? What should I do? I can't get into a fight before my first day is over, can I? Before I can think of anything my new bunkmate continues, 'You don't look too bad, though. Least you ain't a nigger. Them's the worst. Name's Tolliver. Coralee Tolliver.' (Dermody 18)

Since her assignment on Treasure Island provided no real enemy, her bunkmate, Tolliver, became a perfect candidate.

Dermody also wrote of her battle with religion, Catholicism. All through her narrative, when circumstances turned bad, she blamed her lack of faith or practice. For example, when Dermody's father fell ill, she attributed his sickness to her failure to say the rosary:

I wish I had my rosary with me. Grandmother Scanlon was never with-

out hers, you really need one at a time like this. I put my folded-up raincoat between me and the window for a pillow and try to say the rosary by counting on my fingers. I keep losing count, I'm so worried something terrible is happening. I haven't been going to mass every Sunday like I should. To be honest, I haven't been since I made my Easter duty last month. Daddy won't die just to punish me for being a sinner, will he? I try to make a sincere Act of Contrition, promise to do better. I hope it's not too late. (Dermody 173)

Instead of fighting the real enemy, Dermody contends with guilt and faces the death of her father instead of her fellow soldiers.

A more humorous metaphorical battle is the "Vodka Victory." Dermody and her roommates go to a party on one of the Russian ships in the port. Dermody got really drunk and woke up with a hangover:

All I want to do is go back to sleep and wake up to find it's all a bad dream, like you do sometimes when you are running down Main Street without any clothes. Fat chance. I can hear gypsy violins dancing inside my head. When I shut my eyes I see a set of stainless steel teeth gleaming at me. Whatever would they say at home? Why had I been so stupid? Boris lied to me, him and his Roosian secrets of sobriety. Now I know what to die of mortification really means. There is only one thing to do, just die and face the Day of Judgment early. (Dermody 147-48)

Constructing metaphorical and often humorous battles allow Dermody to accommodate her sense of loss at not having the chance to fight for her country.

She did not receive this chance because of her gender. What she did receive was constant badgering by her male counterparts. She continuously struggled with rude overtures, mistreatment, and lack of respect. Throughout her narrative comments like, "Release a man for active duty. . . It takes five of you broads to do what two guys can do," "Me and my buddies are shipping out tonight. We need a little lovin'. C'mon what's the harm? Dontcha wanna serve your country?" and "The WACS and WAVES will win the war. What the hell am I doing here?" are found. (Dermody 51, 59, 68) Remarks like these undermined the place of women in the military.

Dermody's depiction of the "Gunner's Battle" is most indicative of this undermining:

The target plane putt-putts into view off to starboard. It looks like a real plane that's far away, but it's really a little model controlled by a radio. As it comes within range, all the ack-acks open up at once. We open our mouths as far as we can, tasting the incredible noise; each of us would rather die than stick our fingers in our ears, going deaf is nothing, nothin, to the disgrace of that. From where I stand, waiting to

reload, I can watch Corman, beads of sweat on her delicate upper lip and a smudge of gunneries under her eye, get the simulated enemy plane in the third ring of her gunsight, swing the gun around just a little. She holds for a second, squeezes the trigger toward her once, twice, three times. With a pou-f-f the tiny plane explodes and dives into the lake. The WAVES who have been watching the trajectories cheer. 'You got him.'

'We splashed one.' Tolliver always knows exactly what to say because of the movies.

'Hurray for us. Hurray for our side.' She tries to hug Corman, who is still buckled into her shoulder harness attached to the gun, looking both bewildered and pleased. Tolliver can't stop jumping up and down, 'They should let us Waves have a real shot at those Nips. Look out Tojo...'

'Make way, make way.' Gunny muscles his way through the gathered Waves. All the guns have stopped firing because there is nothing to shoot at except maybe a few mare's tails way up high. Corman looks expectant, but then surprised, as Gunny takes a spanner and adjusts the gunsight, turns it out of alignment five degrees. He glares at her, turns, and glares at all of us. 'You dumb broads costing Uncle Sam too damn much money. Dontcha know how much them drones cost?' (Dermody 56)

Dermody is upset by the Gunny's remarks and actions. She yells at him, "We're supposed to hit the target, aren't we?" She relates that Gunny is angry because, "one of us Waves hit it. You know how the guys get when they can see gals doin' things better'n them. The other crews weren't coming within a mile." (Dermody 58) Even in a practice battle women aren't allowed to be successful.

From Davies's time to Dermody's, nearly two hundred years, war continues to be a man's world. While a woman's place in war has changed gradually from the eighteenth-century to the present, and today's military women fly planes and fire on enemy targets, many continue to wonder, as did Monsignor O'Callaghan in 1944, "what is our beloved country is coming to when we send our young ladies off to war."

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Pilot Study: The Effects of Self-Confrontation Via Video Playback on Self-Efficacy and Self-Esteem During Performance Tasks

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Abstract

The field of social psychology has long been interested in the area of self. Self and related concepts have been the basis for many studies in both sociology and psychology as well as the interdisciplinary field of social psychology. This pilot study dealt with self in the area of self-confrontation via video playback by the use of an experimental design.

Literature Review

A brief review of literature on the topic of self indicates various research studies in the areas of self-discrepancy, self-esteem, self-efficacy, and self-confrontation via video playback. First, in the area of self-discrepancy some exciting research is being conducted. Self-discrepancy theory proposes the existence of a systematic relationship between specific self-conflicts and associated affective and motivational responses (Higgins, 1987). Though self-discrepancy theory is new in its present form, it has close ties to the historical theory bases from which it is derived (such as, cognitive dissonance theory and balance theory) (Higgins, 1987). Two important purposes of self-discrepancy theory are "to predict which types of incompatible beliefs will induce which kinds of negative emotions" and to "consider whether the availability and accessibility of different types of incompatible beliefs induce different kinds of discomfort" (Higgins, 1987). Roney and Sorrentino explored discrepancies between performance and goals (1995). They pursued and found support for their hypothesis that "being motivated should lead to better performance when a person is focused on positive outcomes, or to worse performance if he or she is focused on negative outcomes" (Roney and Sorrentino, 1995). The concepts of positive and negative performance levels, goals, and attaining or maintaining self-congruence are sometimes at odds within the domains of the self. The real, perceived and ideal (or actual, ought and ideal) are the domains in which discrepancies and dissonance can occur within an individual (Higgins, 1987). One study discusses how individuals trivialize the dissonant cognitions as a way of dissonance reduction instead of changing or adjusting their attitude or behavior (Simon, Greenberg, and Brehm, 1995). Though this is not the main area of interest in this study, discrepancies between subjects' performance expectations and their performance evaluations are related to the subjects'

self-efficacy in various situations.

Second, in the area of self-esteem, Schwalbe and Staple point to gender differences in the importance of reflected appraisals, self-perceived competence and social comparisons as sources of self-esteem (1991). These differences can be expected due to the sex role socialization of males and females that may cause "men and women to learn to embrace different criteria for self-evaluation" (Schwalbe and Staple, 1991). Because of this factor, controls for gender must be incorporated into any research design which studies self-esteem of males and females. Owens' (1993) article on the positive and the negative uses of self-esteem addresses global self-esteem, in which he modifies Rosenberg's Self-Esteem Scale, which is unidimensional, by creating a self-esteem scale using two subscales: the positive self-evaluations of respondents are treated as, or defined as self-confidence, and the negative self-evaluations of the respondents as components of self-deprecation (Owens, 1993). These subscales can give a clearer picture of an individual's global self-esteem.

Third, self-efficacy is an area which has fostered many studies. "The topic of self-efficacy is part of a broad literature which has developed around the issues of human agency, mastery and control. Its more delimited focus is on perceptions and assessments of self with regard to competence, effectiveness and causal agency" (Gecas, 1989). According to Bandura's "self-efficacy theory", as quoted in Gecas (1989), the most effective source of efficacy information is personal mastery experiences, such as performance accomplishments. Likewise, in motivation research it has been found that high standards and expectations are found to enhance performance which in turn can enhance positive self-efficacy of those individuals (Cervone, Kopp, Schaumann, and Scott, 1994). Research examining performance has found that there is a strong link between the goals of a particular performance and the self-efficacy judgments made by the performer (Cervone, et al., 1994). This ties self-efficacy back to self-discrepancy in the areas of performance expectations, positive/negative affect and the perceived abilities to accomplish expectations.

Finally, articles on self-confrontation via video playback are found in the social psychology / social science literature. This is not a new concept. Self-confrontation via video playback has been used for many years in the professional areas of educational training (Fuller and Manning, 1973; Holzman, 1969) and psychotherapy (Braucht, 1970; Fuller and Manning, 1973; Holzman, 1969). Holzman points out that "listening to one's recorded voice (or viewing one's video image) deautomatizes his (her) inattention to his (her) voice and peremptorily confronts one with his (her) voice, thus forcing attention onto it" (1969). Self-confrontation "momentarily deautomatizes one's view of oneself and hence stimulates recall, broadens associational realms about oneself and also provokes a defensive stance...the congeries of feelings are present in the

self-confrontation; but it fades rapidly as one copes with the stress of seeing oneself and moves toward a reautomatization of our self-perceptions” (Holzman, 1969). It is this concept on which this research project is focused; the effect of self-confrontation on the cognitive processes of the individual. Does the confrontation cause discrepancies between expected and actual performance? Does the confrontation affect the global self-esteem of the individual? Does the confrontation affect the self-efficacy of the individual in reference to task performance? These are questions we hope to shed some light on with this research pilot study.

Statement of Hypothesis

Two main hypotheses concerning the effects of videotaping and replay on self-efficacy and self-esteem were tested in this study. This paper will concentrate on the results of these two hypotheses. First is an hypothesis in the area of self-efficacy; H1: Subjects who experience video playback will have a greater change (positive or negative) of their self-efficacy rating than subjects who do not experience video playback. This is due to the exposure of the subjects to the immediate playback of their performance. The possibility of the presence of discrepancies between the subjects’ perceived performance and real performance could lead the playback subjects into a greater change in self-efficacy than that of the other two conditions. Second, in the area of self-esteem; H2: Subjects (both high and low self-esteem) who experience video playback will have a greater decrease in their self-esteem ratings than the subjects who do not experience video playback. Again, the possibility of discrepancies from the perceived and real performance could lead the playback subjects to negative self-evaluations and then these negative self-evaluations could be treated as “components of self-deprecation (Owens, 1993). A decrease in global self-esteem would be more likely in this condition than in the other two non-playback conditions.

Method

Sample

The subjects for this study consisted of students, male and female, from two Sociology classes at the University of Texas at Arlington, during the Fall 1996 semester. The classes were Social Statistics (3352) and Individual and Society (3317), both upper-level courses. The subjects were asked to participate in the study on a voluntary basis, as an opportunity to earn extra credit. Forty-five potential subjects signed up initially; however, four of these were no-shows and one refused to sign the consent form upon learning he would be

videotaped. This left forty subjects: twenty-four from SOCI 3317; fifteen from SOCI 3352; and, one from SOCI 3317 summer session (this subject was given \$3.00 in lieu of extra credit points). The final sample consisted of thirteen males and twenty-seven females, basically a 2:1 ratio in favor of the females (see Figure 1A). They ranged in age from 19 to 50, with a mean age of twenty-seven (see Figure 1B). The subjects' race/ethnicity breakdown is as follows: African-American (3 or 7%); Asian-American (1 or 2%); Caucasian (30 or 75%); Hispanic (3 or 7%); Native-American (1 or 2%); Black-Hispanic (1 or 2%); and Kenyan-African (1 or 2%) (see Figure 1C). Subjects represented a variety of majors: Sociology (12 or 30%); Criminal Justice (8 or 20%); Social Work (6 or 15%); Inter-disciplinary Studies (4 or 10%); Information Systems (3 or 7%); Accounting (1 or 2%); Anthropology (1 or 2%); Biology (1 or 2%); Business (1 or 2%); English (1 or 2%); Marketing (1 or 2%); and Nursing (1 or 2%) (see Figure 1D). With respect to year in college most subjects were juniors (16 or 40%), or seniors (20 or 50%), with only 1 freshman (2%), 2 sophomores (5%) and one graduate student (2%) (see Figure 1E).

The subjects were given a list of available lab times in which they could sign up. This list was then compared to a preexisting experimental condition schedule (see Appendix A) to ensure the randomness of the experiment. There were three group conditions for this experiment (see Figure 2). Of the forty subjects, twenty were placed in the experimental playback condition, ten were placed in the experimental non-playback condition and ten were placed in the control condition. Each condition was then divided in half by the level of task difficulty. Fifty percent of subjects from each of the three conditions were placed in the high difficulty of task group and the remaining fifty percent were placed in the low difficulty of task group. All subjects were informed, prior to participation, that all information received would be kept strictly for research purposes only and they would be required to sign a consent form(s) to be able to participate in the experiment.

Design and Procedure

The experiment was conducted in the social psychology lab in the basement of University Hall, on the University of Texas at Arlington campus. The room (see Figure 3) was equipped with one table for the subject and one desk for the researchers, five chairs (one for the subject, two for the researchers, one for video playback, and one extra), one video camera and stand, one TV monitor and VCR with stand. There was also a timer on the researchers' desk which was used to time the readings, five minutes was given to every subject for each reading. The camera was placed in the far left corner of the room and a section of the floor was taped, in a U-shape, in the front right corner of the room for the subjects to stand in for their reading performances. All of the

questionnaire packets, pencils, readings and miscellaneous were stored inside of the researchers' desk, out of the sight of the subjects. The door to the lab was locked while an experiment was in process. A sign was posted on the door to prevent any disturbance, and none occurred.

Upon entering the lab, subjects were asked to sit at the subjects' table and to read and sign the consent form(s) supplied to them by the researchers (see Appendix B1 and B2). The first consent form (B1) was signed by all subjects. This form briefly outlined the nature and purpose of the experiment and explained to subjects that their responses would be used for research purposes only. The second consent form (B2) was the 'permission to video tape' form which was only given to the 30 subjects of the two experimental groups. The subjects were then given the sign up sheet to be given to the instructors of their respective classes for the extra credit points (see Appendix B3).

Subjects in all three groups were then asked to complete the first questionnaire (described in the next section). All of the questionnaires were given with written instructions, as well as verbal instructions to all subjects, in regard to what they were expected to complete. If the subject had any questions during the completion of the questionnaires, they were instructed to feel free to ask the researchers. After completion of this first questionnaire, or baseline measure, subjects were asked to perform their first reading. The readings were divided into two conditions: high difficulty and low difficulty. The first high difficulty reading was RICHARD III, Act I Scene I, by William Shakespeare (see Appendix G1). The first low difficulty reading was THE ADVENTURES OF PINOCCHIO, Chapters 1 and 2, by Carlo Collodi (see Appendix H1). All of the subjects were given instructions for the first reading and then, if there were no questions, the subjects were asked to stand in the taped area facing the camera. They were all told to read the story as if they were reading to a group of adolescents in a library setting. The control subjects were informed that all of the electronic equipment was unplugged and that they were not being videotaped, then they were instructed to begin after the timer had been set by one of the researchers. The two experimental groups were told to begin after the camera had been started and the timer had been set. During the reading performance an observational checklist (described in the next section) was filled out by each researcher/observer.

After the first reading subjects were asked to return to their table. They were then given one of two versions of a second questionnaire (described in the next section). The control and experimental non-playback groups received the same short questionnaire. The experimental play-back group was given a longer version with some video playback questions. When the playback group reached the second instruction sheet they were asked to take a seat in front of the TV monitor in order to watch a playback of their reading performance (see

Figure 3). At this time, the researchers would play back the performance and observe subjects' reaction. After viewing the video playback, the subject was asked to return to the table and finish the second questionnaire.

After the completion of the second questionnaire, subjects were asked to perform their second reading. Once again, the readings were divided into two conditions: high difficulty and low difficulty. The second high difficulty reading was *HAMLET*, Act III Scene I, by William Shakespeare (see Appendix G2). The second low difficulty reading was *WHERE THE RED FERN GROWS*, by Wilson Rawls (see Appendix H2). Again, all of the subjects were given instructions for the second reading and then, if there were no questions, the subjects were asked to stand in the taped area facing the camera. Again, they were all told to read the story as if they were reading to a group of adolescents in a library setting. The control subjects were reminded that all of the electronic equipment was unplugged and they were not being videotaped, then they were instructed to begin after the timer had been set. The two experimental groups were told to begin after the camera had been started and the timer had been set. Again, the readings were assessed via an observational checklist which was filled out by each researcher/observer during the reading performance.

At the completion of the second reading subjects were asked to return to their table. They were then given the final questionnaire (described in the next section), which was to be answered by all subjects in all three groups. While the subject completed the third questionnaire, the researchers would complete their checklist and qualitative statement about the subjects' performance. When the subject was finished, the questionnaire was collected and checked for completion, then the subject was asked if he or she had any questions which could be answered at that time. At the end of the session, each subject was thanked for his or her participation and asked to keep mum with regard to the specifics of the experiment. Each subject was told that they could receive, upon request, a synopsis of the research experiment and findings during the Spring 1997 semester.

Measures

Questionnaires

Three sets of questionnaires were administered during the experiment (see Figure 2). They contained various measures of self-efficacy, self-esteem, expectancy, importance, nervousness or anxiousness, and reaction to task. The first questionnaire, or baseline measure, assessed the subjects' demographic variables, self-efficacy, self-esteem, and task orientation (see Appendix C). The demographic variables questions were referred to earlier in the Sample section. The self-efficacy question addressed the subject's overall sense of self-efficacy. Scores could range from 1, the lowest or most negative, to 6, the

highest or most positive. The self-esteem items were taken from Rosenberg's Global Self-Esteem Scale. This is a series of ten statements related to self in the areas of importance, ability, respect, and so on, each scored from 1 (strongly disagree) to 6 (strongly agree). The total self-esteem score is arrived at by adding each of the ten individual statement scores together. Five statements (3,5,8,9 and 10) were scored inversely due to the negative direction of the statement. The range for the composite score would be from 10, the lowest or most negative, to 60, the highest or most positive. Finally, subjects were asked a general question about their ability at a task such as reading aloud. This question is scored just like the self-efficacy question, scores could range from 1, the lowest or most negative, to 6, the highest or most positive.

The second questionnaire, or first follow-up measure (see Figure 2), contains a set of questions to assess the subjects' self-efficacy and task orientation after the first reading, and the subjects' expectations and opinion of importance regarding the second reading (see Appendix D and Appendix D-Video). The self-efficacy question is different from the first measure in that it asks the question from a situation specific frame of reference, but it is scored like the one in the base-line measure. The task orientation question has more facets to it in this measure. The first question regards the task ability, just as the first measure, but it is asked in the situation specific rather than the general perspective. The subjects are asked to rate themselves as to how they think they actually did perform the task. The question is scored just like the question in the first measure. Next, the subjects are given space to list factors which they believe account for their performance. The third question in this section refers to the subjects' nervousness or anxiousness during the reading task. This question was scored inversely to retain 6 as the highest or most positive level and 1 as the lowest or most negative level. The fourth section concerns the reaction of the subject to the experiment in perceived difficulty, worthwhileness, affect experienced during the task. Responses for the seven questions were in a Likert format, like the self-esteem scale, and were scored similarly. Five questions (1,3,5,6 and 7) were scored inversely due to the negative direction of the question. This was done to keep the scores of the positive statements and affect conditions in the high number direction. Finally, the subjects are asked to write any other comments they might have concerning the first reading.

The next few questions of this second questionnaire are different for subjects depending on what experimental group they were in (see Figure 2). The subjects in the control and experimental non-playback group were asked two more questions pertaining to their expectancy of their performance in the next reading and the importance of performing well (see Appendix D). Both questions are scored from 1 - 6, with the direction being the same as all of the above questions. The subjects in the experimental playback group were asked

more questions after viewing their performance of reading one on video playback (see Appendix D-Video). The first of these questions is an open-ended question referring to what the subjects saw or thought of while viewing. The next two questions dealt with their rating of themselves on video. The first referred only to their presentation of themselves on video. The second referred to their perception of their reading performance on video. The last two questions are the same expectancy and importance questions which were asked of the other two groups. All four of these questions were scored in the same manner as those before, from 1 - 6.

The third questionnaire, or the second follow-up measure (see Figure 2), contains a set of questions to assess the subjects' self-efficacy, task orientation, and self-esteem after completing the second reading (Appendix E). The self-efficacy question is the same as presented in the second questionnaire, and it is scored in like manner. However, this questionnaire gives the subject an opportunity to address the reasons for any differences in self-efficacy from the first to the second reading in an open-ended format. The task orientation section is the same as presented in the second questionnaire, and it too is scored in like manner. The self-esteem section is revisited in the third questionnaire. It is in the same format and is scored the same as it is in the first questionnaire. The final page of the third questionnaire gives the subject one last opportunity to give a qualitative statement or comment about the experiment.

OBSERVATIONAL CHECKLIST

One final set of measures constituted an observational checklist (see Appendix F). Each subject was observed by one or two observers (Phillip Riley, observer 1, observed 75% of the conditions; Rick Webb, observer 2, observed 90% of the conditions). Each subject was given a performance rating of 1, most negative, to 6, most positive, for reading one and for reading two. The subjects in the experimental playback group also received a rating for their reaction to playback which had the same range as the other two rating scales. The observers used a pre-arranged list to record behaviors of the subject, such as body movement, body language, vocal quality, eye contact and utterances. The observers then completed a short qualitative statement about each subject's performance.

Findings

Of the various aspects of self which could be statistically analyzed from the data collected, two will be directly addressed in the present report. The first concerns the effect of video playback on sense of self-efficacy. Subjects who experienced video playback were expected to show greater change (posi-

tive or negative) in self-efficacy rating than the subjects who did not experience video playback. As Table 1 shows there is a negative change in every group when we compare the self-efficacy rating from the first measure to the second measure, as well as from the first measure to the third measure, with the exception of one group. The one group that did not show a negative change was the low difficulty / experimental playback group. This group had no change from the first to the third measure. The low difficulty / experimental playback group had an average score of 4.70, on the 1 - 6 scale referred to earlier, on the first measure. The group dropped to a 3.90 score after playback on the second measure, then their average returned to a score of 4.70 for the third measure. While this reversal of change in self-efficacy is quite interesting it only ranked third at -17.03% for the highest change. The greatest change occurred in the high difficulty / experimental playback group from the first to the second measure (-23.92%), as well as the first to the third measure (-23.92%). This group had an average score of 4.60 on the first measure, which is comparable to the low difficulty / experimental playback groups' score on the first measure. The high difficulty group dropped significantly, however, after viewing their performance on video playback. Their average score dropped to a 3.50. The interesting thing with this group was that their average score remained the same when comparing the first to the third measure, four of the other groups' average scores increased from the second to the third measure and one groups' score decreased from the second to the third measure.

The group with the second highest change in self-efficacy rating was the low difficulty / control group with a change of -20.84% from the first to the third measure. This is somewhat surprising when considering the hypothesis. In fact it is the opposite of the hypothesis considering the amount of change from a condition with no video playback. The other two groups compare similarly to the first. The non-playback groups showed the least amount of change of the three conditions, yet the change from the first to the second and the first to the third were all negative. Overall, the most change in the three groups is with the high difficulty / experimental playback group when the first and the second measure are compared. Because of this finding, though the percentages are somewhat weak, the hypothesis is supported

The second area of consideration is self-esteem. The hypothesis from this area, as stated earlier, is that subjects (both high and low self-esteem) who experience video playback will have a greater decrease in their self-esteem ratings than the subjects who do not experience video playback. As Table 2 indicates the experimental non-playback group, both high and low difficulty, as well as the low difficulty / control group are the only groups to show a decrease in self-esteem rating from the first measure to the second measure. This decrease is a very small one for each of these three groups, each less than

-1.0%.

The high difficulty / control group had the second highest positive change in self-esteem with a score of +2.41%. The high and low difficulty / experimental playback groups, which are particularly involved in the hypothesis, are the exact opposite of the hypothesis. The high difficulty group scored the third highest positive change in self-esteem with a score of +2.32%, while the low difficulty group scored the highest of the three positive change groups with a score of +3.01%. Because of finding the two experimental playback groups with the highest and the third highest change of self-esteem rating of any of the other conditions, the hypothesis in the area of self-esteem is therefore not supported by the data.

Discussion

Now to the results of this study and its hypotheses. The two areas, self-efficacy and self-esteem, contained data which did and did not support their respective hypotheses. The first hypothesis did have some support showing that those who experienced video playback, or self-confrontation, of their performance in the high difficulty condition did change their rating of their self-efficacy with that particular performance task. The percentage of change for the low difficulty / experimental playback group shows the potential of learning to control or adjust ones self-efficacy after self-confrontation through video playback. This of course being registered by the -17.03% change after the first reading and then a complete reversal of the percentage of change back to the original score from the first measure. Unlike the self-efficacy ratings, the self-esteem ratings were basically completely opposite of the hypothesis. With both of the experimental playback conditions scoring a positive rather than a negative change in self-esteem requires the reevaluation of the hypothesis. By this experiment and the measures used one could conclude that the performance task used here has little to no negative effect on any of the conditions tested.

DIRECTIONS FOR FURTHER RESEARCH

First, while gender was not considered in this report, it is potentially an important variable to consider and to try to control for (Schwalbe and Staple, 1991). Due to the self selection of subjects for this experiment, scheduling difficulties and small sample size, some conditions ended up consisting of all one gender (ex., e-non-playback/high difficulty condition = all female), totally excluding males and their possible reactions to the experimental condition. Future studies may control for gender by obtaining the same number of males as females in each condition, while otherwise maintaining random assignment

of subjects to each condition.

A second concern is the number of subjects in the sample. This was a reasonable pilot study, but to be truly effective in testing various hypotheses one should seek to obtain a representative sample size for the population being studied (i.e., University populations). Another reservation about the sample is about external validity. How generalizable are the findings to a larger population. This pilot study came close, I believe, in some of the areas such as the mean age of twenty-seven, but fell far short in the 2:1 ratio of women to men. Future studies might want to consider drawing their sample from some of the University's core classes which all students must take, such as history or political science.

A third consideration is with respect to validity and comprehensiveness of the measures used. This study was conducted during the last few weeks of the fall semester, a time that is full of final test preparation, term paper preparation, holiday festivities and other stressful conditions. If subjects were given a mood assessment in their first questionnaire it might prove more successful in determining reasons for any changes in self-efficacy and self-esteem, especially in an experiment involving public speaking and video playback. Level of fatigue may also have an effect. This study was conducted mainly in the evening hours from 4:00 to 9:00 PM. Many of our subjects reported being tired and this could have had a profound effect on their performance level, their perception of themselves, and their overall sense of self-efficacy, which were main concerns in the study.

A final possible reason for the lack of support for one of the two hypotheses could be that it was just a bad hypothesis. One of the main reasons we conduct an experiment is to test or re-test an idea or a theory, constantly trying to change it and make it closer to perfection. Pilot studies are particularly useful in working out the rough spots before investing months or even years in a research project.

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Surveillance and Alien/Nation: The X-Files and the “Other” Government

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Abstract

Our Republican form of government has historically been viewed as provider and protector of American freedom. In the last three decades, however, controversies such as Watergate, the Tuskegee experiments, and Iran-contra have resulted in an American culture that is suspicious of its own government. *The X-Files*, a television show about UFOs and other paranormal phenomena, is one product of this unique cultural moment in American history. My analysis will show how the theme of government as “other” or enemy of the people is constructed within the introductory montage sequence and various episodes. This is accomplished with allusions to popular American scandals, primarily Watergate, both narrative and stylistic comparisons between the U.S. government and extraterrestrials, and a discussion of the issues of surveillance and secrecy.

Introduction

Scully: “Why would the military kidnap their own pilot?”

Mulder: “That’s the \$64,000 question, Scully.”

-from “Deep Throat”

The music alone could sustain anyone’s attention. The tune is unusual, eerie. It accompanies a series of images that does more than just entertain the viewer; it captivates. The large, looming X is only the beginning of a bizarre visual experience that occurs at breakneck speed. The viewer is led through a series of images, among them an FBI photograph of a flying saucer, a mysterious glowing screen, unidentifiable objects that transform before our eyes, and surveillance footage of an apparition. Rhythmic editing and dark tones of gray and blue heighten this otherworldly, unfamiliar experience that is over before you can begin to contemplate what is happening.

This enigmatic montage sequence provides the introduction and credits of the popular television show *The X-Files*. A television show about UFOs and other paranormal phenomena, *The X-Files* has evolved from a program with few viewers in its first season to a phenomenon in itself. Images of the costars Gillian Anderson and David Duchovny can be seen in numerous magazines and web sites. Scholars from various fields of academia are also exhibiting interest in the series. “*Deny All Knowledge*”: *Reading The X-Files*, an anthology of critical essays published recently by Syracuse University Press, provides ex-

amples of this growing academic interest with scholarship from fields including Women's Studies, English, Linguistics and Communications. How has this program succeeded in creating so much interest during the course of the last four years? Why are people now reacting so strongly to a program that was almost canceled in 1993?

The answers to these questions lie not in the television show's investigation of the paranormal, although the program has helped to usher in a new era of science fiction entertainment in America. The answers lie in its portrayal of the United States government as a suspicious and deceitful organization that functions without regard and often against the interests of the American people. My investigation of The X-Files will explore how the theme of distrust toward government is played out both stylistically and textually in this popular television show. The show places the U.S. government as a menacing "other" or enemy of the people through both visual and narrative methods. These include allusions to popular American scandals, primarily the Watergate scandal of the 1970's, and narrative and visual comparisons between the U.S. government and extraterrestrials. A discussion of the introductory montage sequence, the issues of surveillance and evidence, and an analysis of the stylistic techniques utilized within the series will outline how the theme of government as enemy is presented.

Montage Sequence

Even before a viewer sees a single episode of The X-Files, a description of government as enemy to the people is suggested by the introductory montage sequence. In addition to being the opening credits of the television show, this enigmatic introduction succeeds in displaying no less than thirteen images in forty-five seconds. This fast-paced sequence provides much information about the program including the main characters, their occupation, and important themes within the episodes. In this montage sequence, there are three images that indicate government surveillance and/or government cover-up and, consequently, suggest an image of government as secretive, intrusive, and elusive. These three images include an FBI photograph of a possible flying saucer, security footage of an unidentifiable white figure, and an image of a blue and black screen resembling a radar.

The FBI photograph is a color photograph depicting a sunset or sunrise and a dark landscape. In the lower left corner, a person's silhouette points toward the upper right at a fuzzy, white structure in the sky that fits the common description of a UFO or flying saucer. We can identify this photograph as belonging to the FBI because of the type-written words on the lower right: "FBI PHOTO INTERPRETATION." The caption and the long series of numbers

and letters below it suggests that this photograph is, in fact, just one in a vast collection, or series, of similar photographs subject to FBI analysis or “interpretation.” The possibility of an archive of this kind of information is not, in itself, an alarming one but when considering the owners of the archive, the FBI, it becomes so. Ownership of this information by a government agency establishes that this information, and possibly much more, is unavailable to the average citizen. The notion of a secretive government agency and the existence of valuable, undisclosed information is perceived by many citizens as a threat to their freedoms.

Both government cover-up and surveillance are suggested quite overtly in the security camera footage. This footage displays the image of a fuzzy, ghost-like figure. From the high position of the camera and the location in a hallway, the footage appears to have been taken with a surveillance camera. The white form walks toward the left foreground as the words “GOVERNMENT DENIES KNOWLEDGE” in white letters moves toward the background. The caption obviously postulates the existence of government cover-up while the very nature of the security camera, positioned high above the subject and possibly even concealed from the view of the subject, indicates the existence of unwanted government surveillance and, consequently, an intrusive government.

The final image I want to comment on, when paired with the previous security camera footage, confirms the idea of encroaching government surveillance. In varying shades of blue and black, we are shown something that resembles a radar screen although the glowing, pale blue lines do not appear to be what is normally displayed on one. As a dark arm moves across the screen from right to left, the camera moves in for a closer shot and fades into the next image just after revealing the undeniable figure of a glowing blue question mark in the center of the screen. Because this screen resembles a radar, it can be assumed that it serves a similar purpose—that of observation. This mysterious, electrical screen, the image of the shadowy and disembodied observer, and the unmistakable question mark leave the audience member wondering what is being observed and who is doing the observing. One of the closing images of the sequence, extreme close-up footage of a human eye opening in real time, underscores the importance of the surveillance theme with dramatic clarity while implying that the viewers themselves may be susceptible to Big Brother’s indiscriminate gaze.

Scandal and Cover-up

Allusions to past scandals, particularly that of the Watergate Scandal of the 1970’s, are numerous within The X-Files. This tactic functions as an effective means of constructing the government as “other” or enemy by constantly re-

minding viewers of past wrongdoing and by comparing the narrative of the program with that of U.S. history. These allusions run the gamut from obvious narrative references such as character comparisons to more subtle but pervasive thematic allusions.

The most easily recognizable reference to past scandal is the character who identifies himself as "Deep Throat" in the second episode of the first season. Similar to the original Deep Throat of the Watergate scandal, this character is a high-ranking official within the government and provides vital information necessary to Mulder and Scully's investigations. The very existence of this character in the show lends credence to a comparison between the narrative of the program and the Watergate scandal, characterizing the government within the show as one capable of conspiracy at the highest levels. It also succeeds in comparing the characters of Mulder and Scully to Bob Woodward and Carl Bernstein, the two popular reporters credited with the discovery of Watergate two decades ago (Graham, 59). This characterization of Mulder and Scully as modern-day television versions of Woodward and Bernstein is reinforced by their behavior as investigators. An obvious example of this kind of comparison in behavior occurs within the second episode shortly after the introduction of Deep Throat and during the course of an investigation into the mysterious whereabouts of a missing air force pilot. In an effort to obtain information from an uncooperative air force officer, Mulder and Scully accost him as he arrives at his home and bombard him with questions as they follow him to his front door. Yelling questions and aggressively following the officer, Mulder and Scully's efforts are met only with his refusal to comment. The coupling of this kind of behavior with a stylistic change, the altering of camera movement during the filming of this scene, effectively suggests the Woodward and Bernstein comparison. A noticeable and abrupt change occurs from the smooth, flowing movement of the camera prior to this scene to a bumpy, hand-held movement of the camera within the scene. As soon as Mulder and Scully begin to approach the officer we notice camera movement reminiscent of television investigative reporting. Any viewer that has ever watched an episode of 60 Minutes or Prime Time Live would immediately associate this bumpy, film movement with that of investigative television journalism. This comparison is underscored, by the fact that Mulder and Scully are themselves approached immediately after by a reporter asking similar questions.

Surveillance, a pervasive theme within the show, serves as a perpetual reference to the Watergate scandal by reminding viewers of Nixon's bugging of the Democratic Headquarters and tape-recorded Oval Office conversations. Surveillance becomes an obvious theme from the very beginning of the series with the show's pilot. The viewer is introduced to the character of Agent Scully in a dark FBI office filled with mysterious agents as she is given her new

assignment, that of observing and reporting on the actions of her partner. Scully is ordered to function as a spy maintaining surveillance on Agent Mulder for their FBI superiors. In addition to enacting the notion of unwanted government surveillance, Scully's assignment suggests the existence of secrecy within the ranks of the government organization itself. This scene also establishes that even federal agents are susceptible to the secret agendas of the government. A menacing reminder of the possibility of constant government surveillance also appears frequently within the series in the form of "Men in Black," a reference to actual reports of mysterious men, believed to be employees of the National Security Agency, that have been reported as questioning and even intimidating citizens in the past. These mysterious agents of government power serve as indicators of constant government surveillance within the series. During the episode entitled "Deep Throat," we are presented with what is suggested to be a typical confrontation with these agents or "Men in Black." Soon after the observation of unidentified flying objects over the air force base by Mulder and Scully, they meet with mysterious men in black suits in the middle of a deserted highway. These men force agents Mulder and Scully out of their vehicle, steal information from their files, destroy film, take the ammunition from Mulder and Scully's guns, and respond to Mulder's questions with violence. The mysterious arrivals of these "Men in Black" after the discovery of vital evidence occurs often and, therefore, suggests constant government surveillance. When coupled with irrational, illegal or violent behavior, they also confirm the existence of an unchecked and dangerous government.

The Watergate scandal is invoked with the issue of evidence within the program as well (Graham, 56). Both the disappearance of actual physical evidence and the loss and recovery of evidence in the form of memory are continuing themes throughout the series. The disappearance of evidence occurs whenever the two characters seem to come to a breakthrough in the ongoing investigation of the government cover-up of UFOs. The repeated loss of vital, undeniable proof reminds viewers of the Watergate scandal and the suspicious disappearance of over eighteen minutes of taped conversation that were said to have included evidence of Nixon's wrongdoing. The pilot episode of The X-Files presents an answer to the seemingly unanswerable question "Where does it all disappear to?" After the suspicious destruction of crucial evidence in an alien abduction case, we observe as Scully presents proof of extraterrestrial existence to her FBI superiors in the form of a probe made from an unidentifiable metal. The program closes with a scene showing a mysterious FBI agent placing the metal probe in a clear plastic case with several other similar probes. He closes the case and returns it to its designated place, a cardboard box labeled with the numbers "100041." The camera pulls back to show that this cardboard box is one of thousands filled with evidence that are located within

a large, dark structure similar to a warehouse. The agent exits and viewers are given a clear shot of a sign on the entrance indicating this archive's location: "In case of fire or emergency know your exits. Pentagon Evacuation Procedure".

Memory, of course, can function as evidence in the form of eyewitness testimony. The loss and recovery of memory as a theme is used often to point to government wrongdoing and cover-up. This is utilized in the "Deep Throat" episode when Agents Mulder and Scully discover the inexplicable and selective amnesia of two former air force pilots involved in a top secret government project. Previous suspicions of government wrongdoing are substantiated later in the episode when Mulder is abducted by soldiers and given selective amnesia himself. The abduction of Agent Mulder's sister, the most important and influential event of his life, is also connected to the Watergate scandal through the issue of memory. For many episodes, Mulder is unable to recount the details of his sister's abduction even though he was in the very room where it occurred. For Mulder, the recovery of his memory could provide an explanation for that unfortunate occurrence and, therefore, represents the possibility of her return. Throughout the four seasons of the show, Mulder slowly recovers his memory of the event while also gathering more and more evidence of government involvement with extraterrestrials. The first show of the second season, "Little Green Men," provides viewers with details concerning the disappearance of Agent Mulder's sister in 1973 through a flashback sequence. We observe that Mulder was, in fact, watching a news story concerning the missing minutes of the Watergate tapes just prior to his sister's abduction. The event that is described as being the driving force for his investigations and is, consequently, an important foundation for the television show, is undeniably shown as being associated with the Watergate scandal (Graham, 57).

The Government/Extraterrestrial Connection

Comparisons between the United States government and extraterrestrials are numerous throughout The X-Files. These comparisons are created within the narrative of the shows and also through stylistic techniques during filming. They provide significant insight into the show's view of government when you consider popular ideas surrounding the notion of extraterrestrials. The most common perception of extraterrestrials is that of "alien." This term, as dictionaries suggest, is derived from a belief that extraterrestrials are both "foreign" (Webster's 12) and "hostile" to us (12). Government/extraterrestrial comparison proposes a similarity between the two or government as "alien" and, therefore, a threat to the American people. Examples of these government/extraterrestrial comparisons appear in the episodes "Deep Throat" and "Jose

Chung's From Outer Space."

"Jose Chung's From Outer Space" is a bizarre and humorous episode involving an investigation into the alien abduction of two teenagers. While following Jose Chung, a writer who intends on recording the experiences of several people involved with this case, viewers attempt to put together the events of that particular evening and the days after. A major theme throughout the show is the similarity between the government and extraterrestrials. Government/extraterrestrial comparisons are numerous within the episode; they are presented through the details of the plot and amplified by the stylistic choices of the director.

The first comparison of this kind occurs when we witness the hypnosis of one of the alien abductees. With the filming of her hypnotic trance, the show's creators make a connection between agents of the government and extraterrestrials. Through the character's point of view, we observe the transition she makes to a hypnotic state and watch while the figures of Agent Mulder, Agent Scully, a police officer and a hypnotist fade slowly into the images of stereotypical extraterrestrials. The slow fade of these figures into the images of her alien abductors is a method of breaking down the distinction between human federal agents and extraterrestrial intruders. This technique is repeated with the presentation of the character's second hypnotic experience that, once again, is filmed through her perspective. This time, however, the images of her extraterrestrial abductors have become the images of air force officers and other government officials. These visual transitions from government officials to extraterrestrials and vice versa indicate that government and extraterrestrials, or "aliens," are one and the same. This notion of government as "alien" is confirmed later in the episode when it is disclosed to Mulder that many alien abduction experiences are actually hoaxes perpetrated by the government, which implants fake memories of extraterrestrial abductions in its victims. Scully's autopsy on the remains of a presumed extraterrestrial reveals that the stereotypical-looking "alien" is, actually, a deceased air force pilot in a rubber "alien" costume. The government-as-alien metaphor proposed earlier in the hypnosis scenes is realized—the government and agents of the government are now shown masquerading as "aliens." This theme of masquerade involves the characters of Agents Mulder and Scully. Jose Chung's interview with an unreliable alien enthusiast provides humorous examples of this kind of comparison. While recalling the events following the "alien abduction," he describes Mulder and Scully by saying "One of them was disguised as a woman but wasn't pulling it off. Like, her hair was red but it was a little too red. You know? And the other one...the tall, lanky one...his face was so blank and expressionless. He didn't even seem human. I think he was a mandroid." This witness' descriptions of the main characters are less than complimentary, of course, but

also presents these government agents as extraterrestrials impersonating humans.

We see the government/extraterrestrial comparison in the show entitled "Deep Throat" as well. Similar to the Woodward and Bernstein allusion discussed prior, this show's comparison relies on the audience's past experiences as viewers of mass media to suggest a likeness. As mentioned earlier in the paper, this particular episode involves an investigation into the mysterious disappearance of an air force pilot in a top secret government program and culminates in Mulder's abduction and erasure of memory by government forces. During the course of the show, it becomes clear that this secret government program is responsible for the numerous UFOs, or Unidentified Flying Objects, reported in the area. The film sequence describing this abduction and the procedure inflicted upon Mulder functions as a visual comparison between government and extraterrestrials by evoking characteristics of popular alien abduction narratives. Opening with the image of a truck arriving at a hanger, the sequence runs through Mulder's government "abduction" experience. After Mulder is rolled out of the back of the truck strapped to a gurney and drugged, we are shown his perspective of the abduction as he passes in and out of consciousness. The sequence becomes foggy indicating his drugged state and the otherworldly nature of this abduction. Through Mulder, we are shown unidentifiable flashing lights, mysterious men working in white lab coats, and an aircraft, probably the UFO observed earlier, partially concealed behind a curtain. The scene reaches its finale with the procedure of memory erasure and images associated with the proverbial alien examination: a bright light flashes into the camera, or Mulder's face, from above as men dressed in surgical masks hover overhead. This sequence in its entirety proposes that Mulder's experience is similar to popular "alien" abduction narratives and, hence, situates the government in the role of extraterrestrials or "aliens."

In the episode "Fallen Angel," we are given an additional example of this kind of visual comparison. With stylistic techniques similar to those used in the sequence just discussed, a connection between government and extraterrestrials is once again drawn. During the taping of the scene describing a secretive military cleanup operation, viewers are shown an image of the military that likens them to images of extraterrestrials from 1950's science fiction films. We watch as Mulder comes across a large area where military soldiers in protective gear are performing a task involving the spraying of a dense, smoky matter. The soldiers in large, silver, space age outfits standing in this atmosphere dense with brightly lit fog conjures images of an alien landscape and reminds viewers of early films in the science fiction genre. This portrayal of the government as looking similar to aliens resonates with Steven Spielberg's E.T. The Extra-Terrestrial filmed in 1982. Spielberg's scene describing the

seizing of Elliot's household and E.T. shows a series of events that portray the government as menacing alien invaders. A looming shadow in the parking lot begins the sequence by suggesting the existence of imminent danger. Soon afterward, a hazy fog descends upon the home as government officials in large space suits break in and surround the family from all directions. Government agents in white spacesuits rhythmically move toward the family members with their arms raised before them like extraterrestrial monsters out of early science fictions tales. This idea is echoed by the troops of similarly dressed figures shown marching toward the home. This government invasion results in the total transformation of this American home into a foreign-looking landscape of sterile plastic sheets and white tubing. This scene and similar scenes in The X-Files do more than just suggest a comparison between the government and extraterrestrials; they propose that the government is more "alien" than the extraterrestrials they study.

Conclusion

An adversarial characterization of our government, like the one presented in The X-Files, succeeds in drawing viewers for two primary reasons: our country's historic preoccupation with conspiracy and the predominant feeling of distrust toward government shared by many Americans at this time. Ever since the American Revolution, the United States has been a nation obsessed with the idea of conspiracy. In his book entitled The Fear of Conspiracy: Images of Un-American Subversion From the Revolution to the Present, David Brion Davis states that we are a country that has "supposedly been threatened by a long succession of dark conspiratorial powers" since its birth (8). Regardless of whether this fascination with conspiracy stems from a national insecurity or a heritage of revolution, it is obvious that Americans are now and have always been fascinated by conspiracy texts. Throughout our relatively brief life as a nation, there have been numerous conspiracies that have punctuated our history. Colonial fears of British rule were only the beginning of over two hundred years filled with conspiracy texts. Countersubversives have proposed numerous groups and individuals as enemies to American interests, primarily individual freedom. And since our Republican form of government has historically been seen as both the provider and protector of American notions of freedom, conspirators were often portrayed as attempting to destroy the American government.

Recently, however, we have seen a shift in the ongoing evolution of the American conspiracy genre. As a result of numerous exposed government cover-ups within the last three decades, many Americans believe that the government that once "guaranteed" their freedoms now stands as a threat to them.

Controversies such as Watergate, the Tuskegee experiments, and Iran- contra, along with the disillusionment of the Vietnam War, have resulted in a society that feels suspicious of and isolated from its government. Historian Ruth Rosen recently wrote "What unites the wildly diverse audience of *The X-Files* is a deep and abiding distrust of our government—a legacy from the nation's founders, yes, but one that has been powerfully reinforced during the past three decades" (B7). *The X-Files* and its assertion of government as enemy to the American people, stands as a reflection of this cynical society—our society.

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Attentiveness and Empathic Accuracy

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Abstract

Funder (1995) proposed the realistic accuracy model (RAM) to account for accuracy in personality judgment. An initial condition in the model is the perceiver's ability to detect and observe the target's behavior (i.e. perceiver's attentiveness). The present study extended Funder's model to examine the role of attentiveness in empathic accuracy (i.e. accuracy in inferring the content of a target person's thoughts and feelings). Data from three previous empathic accuracy studies were re-analyzed to test the hypothesized positive correlation between attentiveness and accuracy. The results revealed mixed support for the hypothesis, most likely because of confounding methodological differences.

Ickes (1993) identified four basic areas of study that are related to interpersonal judgment accuracy. The first area focuses on the perceiver's accuracy of judging the personality traits of others. The next, and somewhat more recent, area examines the perceiver's ability to understand the attitudes, values, and self-conceptions of others. Even more recently, a third research area has considered the perceiver's ability to infer the emotional states of others. Finally, and most recently, the study of empathic accuracy has addressed the perceiver's ability to correctly infer the specific content of another person's thoughts and feelings.

Past research has identified several factors that affect empathic accuracy. For example, the results of three studies have confirmed that the level of acquaintanceship between the perceiver and target affects the level of the perceiver's empathic accuracy (Gesn, 1995; Graham, 1994; Stinson & Ickes, 1992). In addition, Ickes, Stinson, Bissonnette, and Garcia (1990) demonstrated that empathic accuracy can be affected by the perceiver's degree of interest in the target. Finally, it appears the motivation of the perceiver may also have an influence on empathic accuracy, sometimes operating to reduce understanding between intimate partners in situations in which an accurate understanding of the partner's thoughts and feelings might threaten the relationship (Simpson, Ickes, Blackstone, 1994).

The present study examines another, presumably basic, factor that can be assumed to influence empathic accuracy: the perceiver's attentiveness to the target person's behavior. Funder (1995) proposed a realistic accuracy model (RAM) to explain differences in the accuracy of personality judgment. In the RAM model, one of the first conditions that must be met is that the perceiver

detects the target's behavior. If the target's cues are not noticed by the perceiver then that information is lost. The attentiveness of the perceiver should therefore be of fundamental importance as a precondition of his or her empathic accuracy. The present study sought to measure the attentiveness and examine its relationship to empathic accuracy in the data sets from three previous studies. Attentiveness will be assessed by means of a self-report measure in the first of these studies and by means of behavioral or "behavioroid" measures in the remaining studies. It is predicted that the more attentive the perceiver is to the target person, the more accurate he or she will be at inferring the target person's thoughts and feelings.

Method

As noted above, the present study involved a secondary analysis of data sets taken from three previous studies of empathic accuracy. The data used were from Gesn (1997), Ickes, Stinson, & Bissonnette (1989), and Ickes, Stinson, Bissonnette, & Garcia (1990).

Gesn (1997)

Participants. The participants were 72 students enrolled in introductory psychology classes at the University of Texas at Arlington who received partial course credit for their participation in the research.

Procedure. Three video tapes of different female clients talking to a male, client-centered therapist were used as the stimulus materials. Participants were seated in individual cubicles and asked to watch each of the three tapes. At various points, the tape was stopped and the participant was asked to infer the content of the specific thought or feeling that the client had actually reported at that point. These inferred thoughts and feeling were later compared to the actual thoughts or feelings the client reported and coded for the degree of empathic accuracy. Overall (aggregated) empathic accuracy scores reflected how accurate the perceiver was across the entire set of thought/feeling inferences for each target. Participants were also asked to provide a self-report measure of how attentive they were while watching each of the three tapes. These self-report scores were used as the measure of attentiveness in the present study. Further details regarding the procedure can be found in Gesn (1997).

Ickes, Stinson, and Bissonnette (1989)

Participants. The participants were 112 students enrolled in introductory psychology classes at the University of Texas at Arlington who received partial class credit for their participation in the research. They were randomly paired into 56 same-sex dyads (26 male-male dyads and 30 female-female dyads).

Procedure. The two participants — always strangers — were seated with each other and left alone together for 5 minutes while the experimenter went to complete an ostensible errand. Their spontaneous interaction behavior during this time period was covertly videotaped. In a subsequent phase of the study, they were asked to individually watch the tape and report all the thoughts and feelings they had at the time of the taping, also noting the specific points at which these thoughts and feelings occurred. Each participant then watched the tape a second time and tried to infer the specific thoughts and feelings that were similarly reported by the other participant. These inferred thoughts and feelings were then compared to the actual, reported ones and rated for their level of empathic accuracy.

A factor analysis of other dependent measures collected in the study revealed two factors, which appeared to define different aspects of the perceiver's attentiveness. The variables that loaded highly on the first factor were the number of times the perceiver gazed at the partner, the number of times the perceiver addressed a question to the partner, and the number of times the perceiver initiated a conversation sequence. Based on the variables that loaded on this factor, it appeared to be a behavioral measure of attentiveness. The second factor was empirically defined by the percentage of thoughts and feelings the perceiver reported having had about the partner. This factor appeared to be a cognitive measure of attentiveness. All variable values were converted to z-scores before the factor analysis was conducted. A detailed description of the study is available in Ickes et al. (1989)

Ickes, Stinson, Bissonnette, and Garcia (1990)

Participants. The participants were 76 students enrolled in introductory psychology classes at the University of Texas at Arlington who received partial course credit for their participation in the research. They were randomly paired into 38 mixed-sex (male-female) dyads.

Procedure. The two participants — always strangers — were seated with each other and left alone together for 5 minutes while the experimenter went to complete an ostensible errand. As in the previous study, the participants were later separated, asked to watch the tape, and report all of the thoughts and feelings they remembered having had during the videotaped interaction. They were then asked to watch the tape a second time and infer the thoughts and feelings of the partner. Their thought/feeling inferences were then compared to the actual thoughts and feelings reported by the partner, and rated their degree of empathic accuracy.

A factor analysis of other dependent measures collected in this study revealed a single attentiveness factor. The variables that loaded on this factor were (a) the percentage of thoughts and feelings the perceiver reported hav-

ing had about the partner, and measures of the number of times the perceiver (b) used second-person pronouns to refer to the partner, (c) looked at partner, (d) asked the partner a question, and (e) initiated a conversation sequence. All variable values were converted to z-scores before the factor analysis. These variables were used to define the measure of attentiveness used in this study. Further about the study are available in Ickes, et al. (1990)

Results

Gesn (1997)

Pearson correlations were computed which revealed the expected positive relationship between self-reported attentiveness and empathic accuracy for each of the three stimulus tapes. The average correlation across all three tapes was statistically significant, $r = .27$, $p < .02$. A regression analysis treating attentiveness as the predictor with empathic accuracy as the criterion was significant at the same level, $t(1) = 2.38$, $p < .02$.

Ickes, Stinson, and Bissonnette (1989)

Due to the nature of the experimental design, a statistical technique designed by Gonzalez and Griffin (1997) was used to analyze the data. The technique is designed to deal appropriately with interdependence in the responses of dyad members. For a detailed description, see Gonzalez and Griffin (1997).

Table 1 includes, for the subset of male-male dyads, the interpartner (intraclass) correlations for the attentiveness and empathic accuracy (see Gonzalez & Griffin, 1997). Because the interpartner correlations were not substantial, the assumptions were not met to calculate correlations at the individual and dyadic levels. As the data in the last column of Table 1 indicate, the overall correlations of attentiveness and empathic accuracy were close to zero and not statistically significant for either the behavioral (Factor 1) or the cognitive (Factor 2) attentiveness factors.

Table 1

Correlations Found in Factor One and Two in the Male-Male Dyads

	Intraclass Attentiveness	Intraclass Empathic Accuracy	Cross-Intraclass	Overall
Factor 1.	.42*	.03	-.31	.01
Factor 2.	.35	.03	-.06	-.01

* $p < .02$.

Table 1 includes, for the subset of female-female dyads, the interpartner (intraclass) correlations for the attentiveness and empathic accuracy variables, along with the cross-intraclass and overall correlations of attentiveness and empathic accuracy (see Gonzalez & Griffin, 1997). Although assumptions of substantial interpartner correlations on both variables were met in this case, tests of the individual and dyadic level correlations again revealed no significant associations between either measure of attentiveness and empathic accuracy (all correlations were in the range of -.08 and .13).

Table 2
Correlations in Factor One and Two in All Female Dyads

	Intraclass Attentiveness	Intraclass Empathic Accuracy	Cross-Intraclass	Overall
Factor 1.	.45*	.45*	.06	.03
Factor 2.	.24	.45*	-.03	-.08

* $p < .01$.

Interestingly, the interclass correlation for empathic accuracy was significant for the female-female dyads in this study (see Table 2, column 2), but not for the male-male dyads (see Table 1, column 2). This serendipitous finding is intriguing in its implication that female strangers achieved similar levels of empathic accuracy as a consequence of their initial interaction, whereas male strangers did not.

Ickes, Stinson, Bissonnette, and Garcia (1990)

The Gonzalez and Griffin (1997) method was again used to analyze the data. In this case, the use of mixed-sex dyads required that gender be partialled out of the correlations reported in Table 3, which again includes the interpartner (intraclass) correlations for the attentiveness and empathic accuracy variables, along with the cross-intraclass and overall correlations of attentiveness and empathic accuracy. The appropriate assumptions were not met to compute individual and dyad-level correlations, and the overall correlation, $r = .20$, was not statistically significant.

Table 3
Correlations Found in Mixed Sex Dyads

Intraclass Attentiveness	Intraclass Empathic Accuracy	Cross-Intraclass	Overall
.19	-.16	-.03	.20

Discussion

Attentiveness was significantly correlated with empathic accuracy only in the study in which attentiveness was measured directly, by means of the participant’s own self-report, and in which the participants were run individually (Gesn, 1997). On the other hand, no significant correlation of these variables was found in the two studies in which attentiveness was measured more directly, by behavioral or “behavioroid” measures, and in which the participants were run in pairs (i.e., dyads) (Ickes et al., 1989; Ickes et al., 1990).

Unfortunately, because the method for assessing attentiveness is confounded with the type of study (single-subject design vs. dyad design) in these data, the reason for the differences in the results across the set of studies can not be determined at this point. To answer this question, future research will be needed in which both direct (self-report) and indirect (behavioral or “behavioroid”) measures of attentiveness are collected in the two types of studies. Until then, the evidence regarding the hypothesized positive relation between attentiveness and empathic accuracy must be regarded as somewhat mixed, and likely influenced by methodological factors that remain to be determined.

Interestingly, the intraclass correlation for empathic accuracy was significant for the female-female dyads in the Ickes et al. (1990) study (see Table 2, column 2), but not for the male-male dyads (see Table 1, column 2). This serendipitous finding suggests that female strangers achieved similar levels of empathic accuracy as a consequence of their initial interaction, whereas male strangers did not. We can only speculate at this point what this finding might mean. Perhaps social norms make it easier for female strangers than for male strangers to adopt each other’s perspectives and to “see the world through each other’s eyes” in an initial interaction. A metaperspective-taking difference of this sort might account for the substantial similarity in the women’s, but not the men’s, empathic accuracy scores. Future research is also needed to examine this intriguing possibility.

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The *corC* locus of *Salmonella typhimurium* encodes a protein homologous to the putative hemolysin TlyC of *Serpulina hyodysenteriae*.

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Abstract

The gene product of the *corC* locus of *Salmonella typhimurium* participates in the trans-membrane flux of Mg^{2+} via the CorA Mg^{2+} transport system. *CorC* mutants have no effect on the influx activity of the system but do diminish the efflux activity. The *corC* locus consists of a single open reading frame encoding a polypeptide of 293 amino acid residues in length with a deduced molecular weight of 33 kDa. Hydropathy plots suggest that the *corC* gene product is not an integral membrane protein and preliminary experiments indicate that it is secreted from the cell. Thus CorC is not likely to be a structural component of the CorA Mg^{2+} transport system. CorC exhibits considerable sequence homology to TlyC, a novel hemolysin recently identified in *Serpulina hyodysenteriae* and *Haemophilus influenzae*. Unlike the classical hemolysins, TlyC is predicted to lyse red blood cells through a proteolytic mechanism rather than a pore forming mechanism. In order to directly evaluate the hemolytic activity of CorC, and to experimentally determine its subcellular disposition, we have fused a peptide linker consisting of six histidine residues to the Glu²⁹² of the polypeptide. The histidine tagged protein can be visualized in samples containing culture media, membrane fractions, or cytoplasmic fractions by standard western blot hybridization techniques using a Ni^{2+} conjugated antibody. Furthermore, the histidine tag will facilitate purification of CorC by affinity chromatography. Purified protein will be prepared and tested for the ability to lyse erythrocytes obtained from a variety of species.

Introduction

Magnesium is the most abundant biologically relevant divalent cation found within the cells of both prokaryotic and eukaryotic organisms. It is an absolute requirement for cell growth, essential for maintaining the structural integrity of membranes, for association of ribosomal subunits, and a cofactor for hundreds of metabolic enzymes [1]. In the gram-negative enteric bacterium *Salmonella typhimurium*, intracellular free Mg^{2+} is tightly controlled: total intracellular Mg^{2+} is maintained within narrow limits while the exogenous levels are changed over a 10^5 fold range [2]. This homeostasis is maintained by the concerted actions of three distinct, highly selective Mg^{2+} influx and efflux systems [1]. The primary Mg^{2+} influx pathway is the CorA system. Unlike the inducible MgtA and MgtB systems, CorA is expressed constitutively and is responsible for 95% of the total Mg^{2+} accumulated under normal growth conditions [3]. CorA is further unique in that it is the only system which is capable of mediating Mg^{2+} efflux [3]. This activity requires any one of three accessory proteins encoded by the *corC*, *corB*, and *corD* genes [4]. Isogenic strains carrying single, double and triple mutations in these loci have a nominal effect on

Mg²⁺ influx. A similar effect on efflux is seen in strains possessing single and double mutations in *corB*, *corC*, or *corD*. However, strains that carry triple insertions in each of these three loci completely abolish efflux activity, with little effect on influx activity [4]. Thus while CorC, CorB and CorD are not required for Mg²⁺ influx via the *corA* system, any one of these proteins are necessary for the CorA to efflux Mg²⁺. In order to investigate nature of these effects, each of the additional *cor* loci were cloned and their nucleotide sequences examined. The data indicate suggest that all three alleles encode relatively small polypeptides, between 114 and 226 amino acid residues in length, which are not predicted to be integral membrane proteins. This observation suggests that CorB, CorC, and CorD, are not structural components of the CorA system. When the nucleotide sequences were compared to those in the current genome databases, CorC was found to possess significant sequence homology to TlyC, novel hemolysin from *Serpulina hyosysenteriae* [5]. Initial attempts to demonstrate hemolytic activity with whole cell extracts from strains overexpressing CorC proved unsuccessful, thus prompting the question of whether the sequence similarity observed between TlyC and CorC is mirrored by functional similarity. In this report, we initiate studies designed to directly characterize the functional activity of CorC using a purified protein reagent. The data obtained from these experiments will facilitate a more thorough evaluation of hemolytic activity and should provide clues toward the nature of the interaction between CorC and the CorA transport protein.

Materials and Methods

Bacterial strains and Plasmids. The bacterial strains and plasmids used in this study are listed in Table 1 along with their sources.

Culture media and reagents. Luria-Burtani (LB) broth was routinely used as the complex growth media [6]. N-minimal broth was used as the minimal growth medium [7]. Antibiotics were added to complex and minimal culture medium respectively at the following concentrations: sodium ampicillin (100 mg/L, 30 mg/L), kanamycin sulfate (50 mg/L, 100 mg/L), chloramphenicol (25 mg/L, 10 mg/L). Restriction endonucleases, T4 DNA ligase, calf intestinal alkaline phosphatase, Klenow fragment of DNA polymerase, S1 nuclease, and T4 polynucleotide kinase, were obtained from Life Technologies, Inc. (Gibco-BRL, Gaithersburg, MD). Sequencing enzymes and associated biochemicals were obtained from U. S. Biochemicals Inc. (Cleveland, OH). Fastflow-NTA resin and Ni²⁺-HRP conjugant were obtained from Qiagen. Additional chemicals were obtained from standard suppliers.

DNA manipulation. Plasmid DNA was prepared from 500 ml cultures using Wizard maxi prep DNA isolation system obtained from Promega (Madi-

son, WI). Restriction endonuclease digestion, DNA ligation, and transformation of plasmid DNA were performed as described previously [8].

SDS-PAGE. Protein samples were separated by SDS-PAGE using 12% acrylamide mini-gels and Tris-Glycine running buffer (1.5M tris pH 8.8, 1.0 M glycine, and 10% SDS). Following electrophoresis, proteins were stained with Coomassie brilliant blue for visualization.

Assay for secreted proteins

Western Blot hybridization. Proteins separated on 12% polyacrylamide gels were transferred onto nitrocellulose by standard techniques. membranes were stained with Ponceau S to verify transfer, then destained in water prior to hybridization. Membranes were washed twice (15 min. each) in TBS tween (20mM Tris pH 7.5, 500 m NaCl, 0.05% tween 20) and blocked for 1 hour in TBS tween containing 3% BSA. Following three 15 minute washed in TBS tween, membranes were scored for prominent hybridization bands using an ECL chemiluminescent assay obtained from Amersham.

Affinity chromatography. His-tagged proteins were separated from cytoplasmic samples using Fast-flow NTA resin obtained from Qiagen. proteins were applied at a flow rate of 1 ml / hour, washed for 12 hours in buffer consisting of 50 mM NaPO₄, 300 mM NaCl, 10% Glycerol, and eluted in wash buffer containing 4 M imadizole. Partially purified proteins separated on 12% gels and visualized by Coomassie staining.

Subcellular localization

Proteins were isolated from 500 ml overnight cultures using a french-pressure cell and fractionated using ultracentrifugation. Cell debris was removed from the whole cell lysate by centrifugation at 13,000 X G for 1 hour. The cleared lysate was subjected to an additional centrifugation step at 100,859 X G for 1 hr. The supernatant containing the cytoplasmic fraction was collected, and the membrane pellet was resuspended in 50 mM Tris pH 7.4).

Results

A polypeptide linker encoding 6 histidine residues and a termination codon was attached to the *S. typhimurium* CorC using gene-fusion techniques and polymerase chain reaction. Mutagenic oligonucleotide primers encoding unique restriction sites at both the 5' and 3' termini were used to amplify *corC* from the plasmid template pRS300. The "reverse" oligo contained an additional mutation which served to extend the open reading frame by 6 codons, each encoding the amino acid histidine. The amplified product was cloned into the plasmid vector pBS KS and introduced into various strains of *Salmonella typhimurium* by electroporation. Expression of the his-tagged protein was confirmed by modified western blot analysis of whole cell lysates using a Ni²⁺-

Horse Radish Peroxidase conjugant. Strains containing plasmid pRS301 produced a prominent hybridization band at the appropriate molecular weight (31 kD) while no hybridization bands were observed in strains containing pBS KS (Fig. 1).

Ter Huurne *et al.* reported that TlyC exhibited low levels of hemolytic activity which could not be prevented by pre-treating erythrocytes in osmoprotectants of various molecular dimensions [5]. This observation suggests that TlyC, and by inference CorC, lyse red blood cells through a novel mechanism which employs the assembly and formation of pores in the target membrane. Regardless of the mechanism, a true hemolysin must interact with the erythrocyte prior to lysis. This interaction requires that the hemolysin be secreted from the cell into the external milieu. In order to determine the disposition of CorC, plasmids expressing the recombinant his-tagged protein were introduced in mutant and wild type strains of *S. typhimurium*, overexpressed, lysed, and fractionated using ultracentrifugation techniques. Plasmid pRS301 was introduced into a strain possessing chromosomal mutations in both the *corC* and *corB* loci (RS406) as well as a wild-type strain 14028s (RS404). Similar strains were constructed using pBS KS. The latter strains served as the null-control group in the expression assays. No hybridization bands were observed in concentrated media samples by either Coomassie or western blot analysis (Fig. 2). Thus CorC is not secreted into the culture medium. A similar result was obtained in fractions consisting of the cell membrane, indicating that CorC is not an integral membrane protein. This result is consistent with analysis of the primary amino acid sequence. Evidence of hybridization was observed in the cytoplasmic fractions prepared from cells expressing the recombinant CorC::6His. (Fig. 3).

Ter Huurne *et al.* observed hemolytic activity in whole cell extracts prepared from strains of *Escherichia coli* expressing plasmid encoded TlyC [5]. No hemolytic activity was observed with the no-plasmid control lysates. It should be noted that the relative amount of hemolysis was far below those observed with true hemolysin such as TlyA or HlyA. These observations are inconsistent with the recent discovery of CorC/TlyC homologs in the *E. coli* host strains. The level of sequence similarity between these proteins is sufficient to suggest that they would possess similar function. If this assumption is true, then the chromosomal copies of CorC/TlyC should exhibit hemolytic activity in the whole cell lysate assay. This suggests that the negative control group used by Ter Huurne *et al.* is invalid. In order to directly evaluate the hemolytic activity of CorC, we sought exploit the chemical properties of the 6-his linker and purify the protein using affinity chromatography. Cytoplasmic samples were loaded onto a Ni²⁺-NTA (nitrilo-tri-acetic acid) column and the bound protein(s) were eluted using 4 M imadizole. Analysis of the eluate indi-

cated that partial purification was achieved but a significant level of background still remains (Fig. 4). This indicates that additional rounds of purification will be required to achieve homogeneity.

Discussion

The data presented in this report indicate that the CorC component of the CorA Mg²⁺ transport system is not an integral membrane protein, but is rather soluble in the cytoplasm. This result suggests that CorC is not a structural component of the transport system and that the effects of *corC* mutations on Mg²⁺ efflux activity reflect an indirect, as yet undetermined, mechanism of interaction with CorA transport protein. Analysis of the primary peptide sequence indicates that CorC bears considerable homology to TlyC, a putative hemolysin from *Serpulina byodysenteriae*. Previous attempts by this laboratory to demonstrate CorC-dependent hemolytic activity proved unsuccessful. Moreover the cytoplasmic disposition of CorC is in direct contrast with the extracellular disposition of dedicated hemolytic proteins such as HlyA and TlyA. In order to directly measure the hemolytic activity of CorC we have initiated experiments designed to purify CorC. At the time of submission we have achieved ~30% purification. Possession of a pure reagent will not only enable us to quantify hemolysis, but will also allow us to investigate the interaction of CorC with the CorA transport system.

Table 1. Strains and Plasmids used in this Work

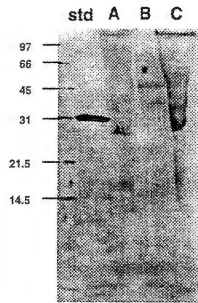
Strain	Genotype/ Plasmid	Source
RS404	Nominal Wild type	ATCC
RS406	<i>corB58::Tn10d16d17(kan)</i> <i>corC58::Tn10d16d17(cam)</i>	This study
RS406 ²	RS406 / pRS300 (CorC+)	This study
RS406 ³	RS406 / pRS301 (CorC-6His)	This study
RS406 ⁴	RS406 / pBS KS +	This study
RS404 ³	RS404 / pRS301 (CorC-6His)	This study
RS404 ⁴	RS404 / pBS KS +	This study

Figure 1. Detection of His-tagged protein in whole cell lysates.

Figure shows a distinct dark band which is the standard to the left at 31 kDa. Lanes A and C have bands at the appropriate molecular weight. These lanes contain the His-tagged proteins while lane B has no prominent band.

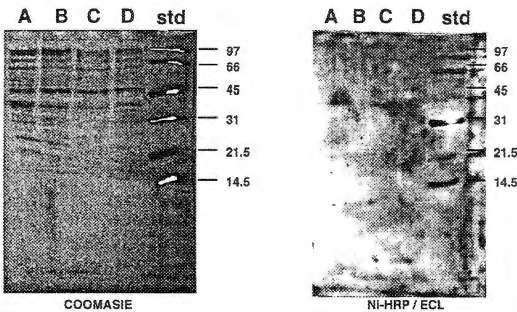
- A *corC-* *corB-* / pRS301 (corC::6His)
- B *corC+* *corB+* / pBS KS+
- C *corC+* *corB+* / pRS301 (corC::6His)

Figure 1. Detection of His-tagged protein in whole cell lysates



- A *corC-* *corB-* / pRS301 (corC:6HIS)
- B *corC+* *corB+* / pBS KS+
- C *corC+* *corB+* / pRS301 (corC:6HIS)

Figure 2. CorC is not secreted into the growth medium



- A *corC-* *corB-* / pBS KS+
- B *corC-* *corB-* / pRS301 (corC:6HIS)
- C *corC+* *corB+* / pBS KS+
- D *corC+* *corB+* / pRS301 (corC:6HIS)

Figure 2. CorC is not secreted into the growth medium. No bands were seen in both the coomassie and western blot analysis. Therefore, CorC is not secreted in the culture medium.

- B *corC-* *corB-* / pRS301 (corC::6His)
- C *corC+* *corB+* / pBS KS+
- D *corC+* *corB+* / pRS301 (corC::6His)
- A *corC-* *corB-* / pBS KS+

Figure 3. CorC:6 His is localized to the cytoplasm.

Figure shows a distinct band in both the coomassie and western blot analysis in the cytoplasm lane (C). There is no band shown in the western blot analysis in either the whole cell (WC) or membrane (M) fractions.

Figure 3. CorC::6His is localized to the cytoplasm

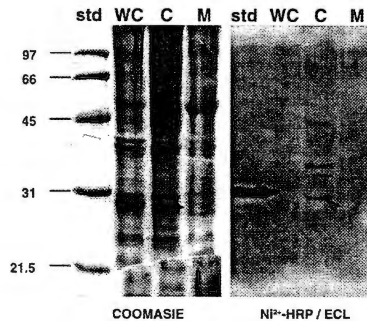


Figure 4. Partial purification of CorC:6His

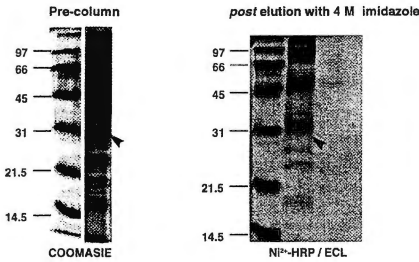


Figure 4. Partial purification of CorC: 6His. A significant level of background is observed. However, the figure indicates the CorC protein to be approximately at 31 kDa.

post elution with 4 M imadizole

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A Comparative Study of the Differences Between Blacks and Whites Regarding Their Monetary Attitudes and Habits

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Abstract

According to the U.S. Bureau of the Census: in 1993, households with White householders had a median measured net worth of \$45,740, while households with Black householders had a median measured net worth of \$4,418. A household's economic well-being depends on its income, as well as its asset accumulation, often referred to as its wealth. Given the significant educational and economic gains for Blacks during the past thirty years, why has there been so little improvement in the quality of life? The massive wealth deficit between Whites and Blacks has often been attributed to racial discrimination, lower levels of income, and the low level of inherited wealth among Blacks. However, this explanation only touches the surface. Our money habits and attitudes often derive from the cultural and religious attitudes and habits of our parents. I assert that the lack of improvement in the quality of life is due to Blacks' inexperience with financial assets, which leads to poor money management skills. According to Cheryl D. Broussard, the author of The Black Woman's Guide to Financial Independence, Blacks save less than 4% of their money and are greater spenders than the general population. Furthermore, studies conducted by the U.S. Census Bureau show vast differences between the investment choices of Blacks and Whites, and a lack of diversification in Blacks' holdings. Unlike Whites, when Blacks seek interest income, they stick almost exclusively to bank accounts and forgo the higher returns paid by money-market funds and bonds. Many of today's middle-class Blacks are the first generation to have enough money to even consider investing and have not benefitted from the investing and saving experience of their parents and other relatives. I will be conducting a study through the use of surveys completed by Black and White professionals in the Dallas-Ft. Worth metroplex. I have composed a survey that will look more closely at frugality, ownership of assets and investment vehicles, the origin of money management skills, and how individuals plan their financial future. I believe that the origin of one's money management skills and frugality, rather than income, are indicators of economic well-being and lead to wealth accumulation.

Introduction

Living in this age of downsizing, easy credit, and Social "Insecurity", it is imperative that individuals be financially responsible and make wealth-building a priority. This is especially important to Black Americans, who are currently finding themselves unable to secure their financial future. Although our society conditions us to spend, and makes it easy for people to live beyond their means, Americans must take control of their financial destiny. This is critical as we move toward the 21st century. Furthermore, our children must be taught the value and power of money at an early age. In turn, this will teach them to become independent, successful, and economically prosperous at a

younger age than previous generations.

Literature Review

Since the 1960's, economists tracking Black economic status have concluded that there has been very little progress made toward achieving economic parity (Swinton, 1994). The National Urban League reported in 1994, that there has been little significant improvement in the quality of life for Blacks since 1990. Data also shows that most Black households do not have any savings, liquid assets, or appreciating property that could sustain them during an emergency, divorce, employment interruption, or uninsured calamity. A household's economic well-being depends on both its income and its wealth. While income is the flow of resources into a household; wealth is its level of resources at any given point in time, or its assets minus any liabilities. In the 1990's, the average Black family does not have the wealth-building resources to control its financial future. Developing political and economic forces do not bode well for Blacks. Black America's frail state makes it vulnerable to international and domestic developments that could converge and do great injury to Blacks around the year 2013. Conditions for Blacks will be made more serious by:

1. Higher unemployment and less public assistance resulting from downsizing and privatization in government services.
2. The merging of international superpower economies that will force Blacks to compete with better prepared and united groups from around the globe.
3. Continued deterioration of Black families, churches, and other institutions (Anderson, 1994).

The enormous gap in wealth has often been labeled as a legacy of slavery, segregation, and discrimination (Swinton, 1994). A four month investigation by Walter L. Updegrave and Money magazine in 1989 showed that racial discrimination still prevents even middle class Blacks from earning as much as Whites; lowers their access to mortgages, business loans, and other financial services; and retards their homes' rates of appreciation. The massive wealth gap can be attributed, in part, to America's longstanding pattern of discrimination.

The percentage of White wealth has remain unchanged from generation to generation. Those who have inherited wealth will likely remain wealthy and powerful (Anderson, 1994). Talented Blacks of previous generations have been discriminated against, and in turn, did not have the opportunity to generate income, so they could not pass on much wealth to the next generation (Updegrave, 1989). Even now, Blacks earn 10-26% less than Whites with similar

educational backgrounds (Updegrave, 1989). Controlling less than two percent of the nation's wealth—primarily in the form of a primary residence, automobile, and savings accounts, Blacks still have little wealth to pass on (Anderson, 1994). The low level of inherited wealth also helps to explain why Blacks trail Whites in the rate of business ownership, which is an excellent way of increasing net worth. Due to the miniscule number of Black businesses, few Blacks ever inherit a business. Discrimination by commercial lenders is yet another factor. A study by University of Vermont economist Timothy Bates concluded that discrimination by banks restricted the access of Blacks to commercial loans. Furthermore, the loans for those Blacks who managed to get financing were almost 40% smaller per dollar of business equity than those given to the White borrowers (Updegrave, 1989). Racial bias by some mortgage lenders and real estate agents also keeps Blacks from increasing their wealth through housing, says Charles Finn, project director at the Hubert Humphrey Institute of Public Affairs at the University of Minnesota. Furthermore, what housing Blacks do get tends to be segregated from Whites. Data shows that regardless of income, Blacks are segregated more than any other racial or ethnic group. "A Black person who makes more than \$50,000 a year will be virtually as segregated as a Black person who makes only \$2,500," says Douglas Massey, director of the Population Research Center at the University of Chicago, who specializes in measuring residential segregation. Discriminatory policies within the banking industry, insurance industry, and mortgage companies have impeded Blacks' economic progress and the acquisition of wealth. In essence, Black heirs are likely to inherit permanent poverty and unpaid debt.

The teaching of basic money management concepts was never a major interest of the Black church or the Civil Rights Movement. In the past, most Blacks were too busy fighting racism to worry about net worth. Given the traditional Black churches' position on money, it is not hard to understand why Black ministers never became strong advocates of individual prosperity. While a small number of non-traditional Black worshipers have been instructed that "God wants you to enjoy an abundant life now", the majority of Blacks have been taught that money is "the root of all evil", and to "store their treasures up in heaven" (Boston, 1996). On the other hand, it is difficult to understand why Black Civil Rights leaders did not advocate prosperity. With the exception of Booker T. Washington, who preached a gospel of hard work, thrift, business organization, and industrial education in the late 1800's, no other national Black leader has truly advocated the importance of creating "personal wealth" (Boston, 1996). There was a time when racial hatred, segregation, and disenfranchisement were the norm in America. Were it not for the spiritual leadership of the Black church and the political agenda of the Civil Rights leaders during

those turbulent times, Blacks could not even begin to turn their attention to increasing their net worth today.

Money does not come with an owner's manual, and most people do not learn about it in school. Our money habits have derived from our cultural and religious attitude and habits of our parents. This upbringing has predetermined the way we save, invest, and squander our money (Broussard, 1996). Many of our parents were unable to save and invest their money. They were too busy trying to provide food and clothes for their family on the low income they received. Many of today's middle-class Blacks are the first generation to have enough money to even consider investing (Updegrave, 1989). Today however, it is clear that the issue is not so much income, as investment choices, because the gap in wealth is far greater than the gap in income.

Blacks may not have any control over America's longstanding pattern of discrimination, but given the significant gains in education and income, why has the wealth gap not lessened? The National Urban League reported in 1994, that while Blacks own \$10,651 in net worth, Whites own \$51,191; in interest income Blacks earn \$872, Whites earn \$7,308; in ownership of mutual funds Blacks own \$115, Whites own \$3,420; in home equity Blacks own \$416, Whites own \$4,561; and in rental property Blacks own \$7,196 compared to \$21,627 owned by Whites. Much has been reported about the 31% of the Black population that lives in poverty (Updegrave, 1989). This singular focus has led to the popular but erroneous assumption that if America solves the problem of Black poverty, economic parity between the races will be achieved. But research shows wide differences that extend beyond the underclass. For instance, of the 7.5% of Black households in America that earn \$50,000 or more annually, the majority of these households experience the same money management problems faced by the majority of Black families, who on average earn \$21,162 (Boston, 1996). These families lack the ability to control their financial destinies, even though they have the income to do so. Furthermore, according to marketing studies on Black individual spending habits, Blacks save less than 4% of their money and are greater spenders than the general population. Blacks hold less than 1% of interest-earning financial investments, however, over 10% of the money of Blacks is tied up in automobiles, expensive clothing, and other consumable items that do not pay interest and are discarded within a short time (Broussard, 1996). These are the consumption habits that play a large part in the demise of the economic status of the Black family and continue the poverty cycle throughout the community. Children must be taught the value and power of money at an early age. This knowledge will increase their interest in obtaining financial assets and give them a critical edge to survive in this competitive global economy. It will also teach them to become independent, successful, and economically prosperous at a much ear-

lier age than past generations.

Methodology

The review of literature supports the fact that there is an enormous wealth gap between Whites and Blacks in America. It is imperative that Blacks gain control of their financial future using the wealth-building resources available to them. Not having any resources available to you can be devastating during a divorce, employment interruption, or an uninsured calamity. Furthermore, the teaching of money management concepts has never been more important in the Black community. Blacks must teach their children the value and power of money at an early age, so that they will take an interest in establishing a wealth-building plan of their own.

This study centers on the following research question: Why has there been so little progress made by Blacks toward achieving economic parity in regards to wealth ownership in America, despite the significant gains in both education and income? Research shows that our upbringing predetermines the way we save, invest, and squander our money (Broussard, 1996). In an attempt to gain some insight into the enormous wealth gap between Whites and Blacks in this country, this study will focus on two primary questions.

1. Where do individuals receive their information regarding personal finance?
2. Does ownership and diversity of assets vary more by race, or income?

The purpose of this study was to compare the extent and patterns of financial planning among Black and White professionals. For the purpose of this study, the definition of professional is that of the American Heritage Dictionary, "An occupation, esp. one requiring training and specialized study". Therefore, those men and women completing the survey were engaged in professions, or professionals. This study was originally going to be based on surveys completed by professionals throughout the Dallas-Ft. Worth area, but due to time and budget constraints, it was not feasible. Instead, 100 questionnaires were distributed at the workplace of professionals located throughout the Arlington area. The sample included various types of professionals working out of offices listed in the Arlington phone book.

Upon completion, the surveys were placed inside envelopes and mailed to my home address in Arlington. The envelopes were already stamped and addressed. The survey yielded a 48% response rate, with 48 professionals participating of the 100. However, since this was a comparative study based on the responses of Whites and Blacks, 5 surveys had to be omitted due to the fact that they were not members of the groups being studied. Of those participating, there were 9 doctors, 8 nurses, 7 attorneys, 7 architects, 5 engineers, 3

teachers, 2 pharmacists, and 2 accountants. Of these, there were 17 Blacks and 26 Whites. One week was allowed for questionnaire distribution, and an additional week was allowed for the data collection.

Each possible respondent received a stamped and addressed envelope containing a one page cover letter, and a three page questionnaire (See Appendix A). The cover letter stated that the purpose of the study was to learn more about the monetary habits and attitudes of professionals like themselves. It also revealed that the study was being sponsored by the McNair Scholars Program at the University of Texas at Arlington, and that their identity and personal information would be held in the strictest of confidence. A personal business card obtained from the McNair Scholars Program was attached to the original prior to copying. I felt that it would probably validate the study, encouraging people to take the time to complete and return the survey. I did not give any indication that the study was a comparative one between Blacks and Whites, for fear of receiving invalid data, or not receiving any response at all.

Although the survey was three pages in length, it was pretested several times. The final version was found easy to read and understand, and did not require more than five to ten minutes to complete. The majority of the questions were close-ended in structure, asking the respondents to select an answer from the list of answers provided. The first part of the survey consisted of background information including: sex, race, age, marital status, number of children and their ages, if any of their children are currently college students, highest level of education obtained, annual household income, profession, and whether they are self-employed, or working for someone else. Race, number of children, and profession were constructed in an open-ended format.

Background Data

Racial Distribution

	Number	Males	Females
Blacks	17	8	9
Whites	26	15	11
total	43	23	20

Age Distribution

	25-34	35-44	45-54	55-64
Blacks	7 / 41%	6 / 35%	4 / 24%	0 / 0%
Whites	12 / 46%	6 / 23%	5 / 19%	3 / 12%

Marital Status

	Single, Never Married	Currently Married	Single
Blacks	6 / 35%	11 / 65%	0 / 0%
Whites	7 / 27%	18 / 69%	1 / 4%

Number of Children and their Status

	0-18 years of age	19+years of age, dependent	19+ years of age, independent	# currently attending college
Blacks	11 / 65%	5 / 85%	2 / 12%	4 / 24%
Whites	10 / 38%	4 / 15%	6 / 23%	4 / 15%

Income Distribution

	\$35,000 or less	\$35,100 - 55,000	\$55,100 or more
Blacks	2 / 11.8%	4 / 23.5%	11 / 64.7%
Whites	6 / 23%	5 / 19%	15 / 58%

Of particular interest to the study was the second part of the questionnaire. First, the respondents were asked to rate the origin of their money management skills from most to least influential. Based on the literature, common origins were listed, such as family, friends, church, self-study, high school, college, and any continuing education or seminars (Broussard, 1996). Respondents were also asked if they retained any of the following as a financial planner: certified public accountant, attorney, broker, certified financial planner, and/or an insurance agent. Next, respondents were asked to indicate ownership of any of the investment vehicles including: a home, business, savings bonds, stocks or mutual funds, rental property, checking account, retirement account, motor vehicle(s), life insurance, and interest earning accounts. The final questions contained in the second part of the questionnaire dealt directly with financial planning and future goals. Respondents were also asked to answer yes or no to the following questions: will you, or have you been able to finance at least 50% of your children’s college education, if applicable; does your household operate on an annual budget; and do you have a clearly defined set of lifetime goals. In addition, after indicating that they would, or have been able to finance at least 50% of their children’s college education, the respondent was asked to list any possible sources of financing. Next, in an open-ended format, respondents were asked how many hours they spent planning their financial future, and what percentage of their income they saved each month. Lastly, there was an open-ended question regarding sources of income anticipated by the respondents upon retirement.

The third part of the survey consisted of questions pertaining to frugality. Respondents were asked to rate their response to statements on a scale ranging from strongly agree to strongly disagree. The first three statements related to frugality. Respondents were supplied with the following definition of frugal, as it appears in the American Heritage Dictionary, “being wise in the management of money and resources”. In *The Millionaire Next Door*, Thomas Stanley and William Danko determined that most of America’s millionaires often attribute their ability to acquire large amounts of wealth to the frugality of themselves and those around them (1996). Furthermore, it was found that

most of these millionaires agreed with the following statements: your parents are frugal; you are frugal; and your spouse is frugal. The same statements were presented to the respondents. The final question asked whether or not the respondent thought that they would be able to maintain their current lifestyle upon retirement. The results gave an overview of the extent and patterns of financial planning among Black and White professionals in the Arlington area.

Results

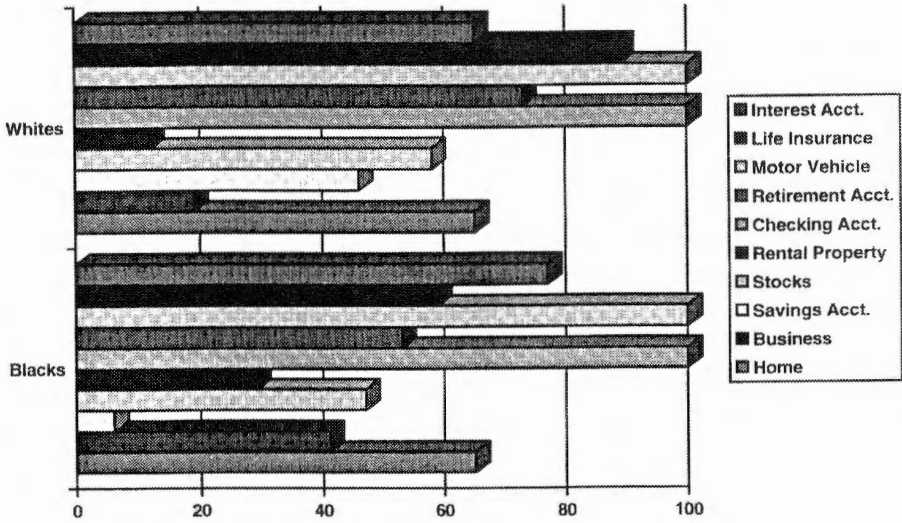
The first part of the questionnaire consisted of background information about each of the respondents. 17 Blacks and 26 Whites participated in the study. There were 23 males and 20 females. Of the 23 males, 15 were White and 8 were Black. Of the 20 females, 11 were White and 9 were Black. On the questionnaire, age was grouped into four categories: 25-34, 35-44, 45-54, and 55-64 years of age. Of the Blacks, 41% were 25-34, 35% were 35-44, and 24% were 45-54 years of age. No Blacks 55-64 years of age participated in this study. Of the White population, 46% were 25-34, 23% were 35-44, 19% were 45-54 and 12% were 55-64 years of age. Marital status was grouped into three categories: single, never married; single, not currently married; and currently married. Of the Black population, 35% identified themselves as single, never married, and the other 65% identified themselves as currently married. Of the White population, 27% identified themselves as single, never married; 69% as currently married; and 4% as single, not currently married. In regards to children, respondents were asked how many children they had in three groups: 0-18 years of age; 19 years of age or older and dependent; and 19 years of age or older and independent. Furthermore, respondents were also asked how many of their children were currently college students. Of the White population, 65% had children. Of those that had children, 82% of them had at least one child who was dependent on them financially. Furthermore, of those that had dependent children, 29% of these were currently enrolled as college students. 76% of the Black population studied reported having children. Of those, all of the respondents classified their children as financially dependent. 31% of those with children, identified them as currently being college students. All of the respondents had obtained at least a bachelor's degree. Annual household income was grouped into three categories: \$35,000 or less, \$35,100-55,000, and \$55,100 or more. Of the White population, 23% chose \$35,000 or less, 19% chose \$35,100-55,000, and 58% chose \$55,100 or more as their annual household income. Of the Black population, 11.8% chose \$35,000 or less, 23.5% chose \$35,100-55,000, and 64.7% chose \$55,100 or more as their annual household income. Of all the respondents, only 23% were self-employed.

Of particular interest to the study was the second part of the question-

naire. First, the respondents were asked to rate the origin of their money management skills from most to least influential. Based on information provided by Cheryl D. Broussard in her book, The Black Woman's Guide to Financial Independence, the following origins were listed: family, friends, church, college, self-study, high school, and continuing education or seminars (1996). Overall, 63% identified family, 35% identified self-study, and 2% identified continuing education or seminars as their single most influential source of money management skills. Of the White respondents, 69% identified family, 27% identified self-study, and 2% identified continuing education or seminars as being their single most influential source of money management skills. Of the Black respondents, 53% identified family, and 47% identified self-study as being their most influential source of money management skills.

Next, respondents were asked if they retained the services of a number of different types of financial planners. The most common types of financial planners noted throughout the literature were listed (Broussard, 1996; Boston, 1996). Overall, only 37% of the respondents retained the services of a financial planner. Of that 37%, 13% reported at least \$35,000, 12% reported \$35,100-55,000, and 75% reported \$55,100 or more as their annual household income. Furthermore, of those who reported using the services of a financial planner, 46.15% were White, and 24% were Black.

The next question looked at asset ownership. The most common vehicles of ownership, as reported by the U.S. Bureau of the Census in 1993 were listed. Respondents were asked to indicate ownership of any or all of the following: home, business, savings bonds, stocks or mutual funds, rental property, checking account, retirement account, motor vehicle(s), life insurance, and an interest earning account. The data yielded from this question was the most revealing of the questionnaire. All of the respondents reported ownership of at least one motor vehicle and checking account. Regarding race, the same percentage of Whites and Blacks reported ownership of a home. A larger percentage of Whites reported ownership of a retirement account, stocks or mutual funds, life insurance, and savings bonds. Furthermore, a larger percentage of Blacks reported ownership of a business, an interest earning account, and rental property. It was also found that as income increases, so does ownership of a home, business, stocks or mutual funds, and rental property.



Ownership of Assets Among Blacks and Whites
(Percentage indicating ownership)

It has been noted numerous times in the literature that having specific financial goals and planning for them accordingly is imperative in the wealth-building process (Constable, 1996; Swinton, 1994; Broussard, 1996; Boston, 1996). The final questions contained in the second part of the survey dealt directly with financial planning and goals. First, respondents were asked if they have been, or will be able to finance at least 50% of their childrens' college education. If they answered yes, respondents were asked to list any possible sources of financing. Of those respondents that had children, 80% reported that they have been, or will be able to finance at least 50% of their childrens' college education. Sources of financing were relatively uniform, including: stock and mutual fund investments, current income, savings bonds, and savings. According to the percentages, it was found that as income increased, so did the ability to finance their child's college education. There appeared to be no correlation between race and the ability to finance the college education of one's children.

The next question asked the respondents to indicate whether or not their household operated on an annual budget. Overall, it was found that only 26% of the respondents' households operated on an annual budget. According to the percentages, there appeared to be no correlation found between either race or income, in regards to the existence of an annual budget. Next, the respondents were asked to indicate whether or not they had a clearly defined set of lifetime goals. 51% of the respondents reported having a clearly defined

set of lifetime goals. Again, neither race nor income appeared to be a factor in having a clearly defined set of lifetime goals. The next question asked respondents to report the number of hours they spent per month planning their financial future. Responses ranged from 0-30 hours per month. Overall, the average number of hours spent was 5.35. Race did not appear to be a factor in the number of hours spent per month, however income was. As annual household income increased, so did the number of hours spent planning one's financial future. Next, respondents were asked to report what percentage of their and their spouses' (if applicable) income was saved each month. Overall, 70% of the respondents reported saving at least 10% of their income each month. Again, it was found that race was not a factor in percentage of income saved each month. The final question in the second part of the questionnaire dealt with pre-retirement planning. Respondents were asked to indicate any possible sources of income they expected to have upon retirement. Responses were relatively uniform, including: pensions, business revenue, savings held in interest bearing accounts or 401k plans, income from stocks or mutual funds, and social security.

In the final section of the questionnaire, respondents were asked to rate their responses to statements on a scale ranging from strongly agree to strongly disagree. The first three statements related to frugality. Respondents were supplied the following definition of frugal, as it appears in the American Heritage Dictionary, "being wise in the management of money and resources". In The Millionaire Next Door, Thomas Stanley and William Danko determined that most of America's millionaires often attribute their ability to acquire large amounts of wealth to the frugality of themselves and those around them. Furthermore, it was found that most of these millionaires agreed with the following statements: your parents are frugal; you are frugal; and your spouse is frugal (1996). The same statements were presented to the respondents in this study. 67% of the respondents indicated that they either strongly agreed or agreed with the statement, "Your parents are frugal". 63% of the respondents indicated that they either strongly agreed or agreed with the statement, "You are frugal". Of those respondents that were currently married, only 39% indicated that they either strongly agreed or agreed with the statement, "Your spouse is frugal". In Smart Money Moves for African Americans, Kelvin Boston emphasizes the importance of planning for retirement (1996). Throughout the book he states that upon retirement, most people are forced to lower their current standard of living. This can be an enormous shock to those in higher income brackets. The final question of the survey asked the respondents to rate their response to the following statement, "You will be able to maintain your current lifestyle upon retirement". 51% of the respondents indicated that they either strongly agreed or agreed that they would be able to maintain their current

lifestyle upon retirement.

Discussion/Suggestions

The primary purpose of this study was to gain some insight into why there has been so little progress made by Blacks toward achieving economic parity, in regards to wealth ownership in America. The study focused on answering two primary questions.

1. Where do individuals receive their information regarding personal finance?
2. Does ownership and diversity of assets vary more by race, or by income?

In the process of collecting and analyzing data reported by Black and White professionals in the Arlington area, I was able to answer these questions. From the data, it was determined that both Black and White professionals receive their most influential information from continuing education or seminars. In regards to the second question, it was determined that ownership and assets vary more by levels of income than by race.

Despite the fact that research questions were answered, there are some problems with this study. First of all, a more representative sample is necessary to draw any real conclusions about the extent and patterns of financial planning among Black and White professionals. Furthermore, a more systematic method of obtaining data from the representative sample is also necessary. The method used in this study can be labeled as "hit or miss" at best. The population studied was picked out of the local phone book, and of course, there was no tactful way of finding out how many Blacks would ever even receive a copy of the survey. Not only was there the problem of obtaining a representative sample in regards to race, but also age. The majority of the respondents were between 25 and 44 years of age.

Although this study was small, it lends itself as the basis for more in depth research on the subject of wealth and asset allocation. Given the opportunity to pursue more research on the subject, I would focus on a population of Whites and Blacks of all levels of income and educational attainment. It would probably be helpful to pursue more in depth information about the exact net worth and asset allocation through the use of personal interviews. Finally, it would be extremely interesting to conduct an investigation comparing the attitudes of older and younger individuals toward money.

Blacks must make wealth-building an immediate priority. Every Black leader must become an advocate of individual asset accumulation. As Updegrave stated in his report "Race and Money", much has been reported about the 31% of the Black population that currently lives in poverty. This singular focus has led to

the popular, but erroneous assumption that if America solves the problem of Black poverty, economic parity between the races will be achieved. Wide differences extend beyond the underclass. America should focus on educating everyone on personal finance. I believe that personal finance should be part of every high school curriculum, as well as in the home. Children must be taught the value and power of money at an early age. It will teach them to become independent, successful, and economically prosperous at a much earlier age.

Our society has conditioned its members to spend, and makes it very easy for people to live beyond their means. Consumer debt, foreclosures, and bankruptcy is on the rise. Having an undesirable credit report can easily exclude an individual from the process of accumulating additional assets. Being labeled as having “bad” credit often results in being denied loans from banks for homes and cars; denial of additional lines of credit; or even renting an apartment without a sizable security deposit; and more importantly, it could mean being denied employment. More and more companies are beginning to perform credit checks, along with the normal criminal background check. These factors clearly illustrate how important it is for individuals to be financially responsible.

There are some recommendations for individuals attempting to take control of their financial destiny. This information can be found in any number of books and articles regarding personal finance. It is extremely important to remember that wealth is not income, it is what you accumulate.

1. Create a written plan of your financial goals and how you intend to achieve them.
2. Diversify your investments.
3. Educate yourself and seek out the help of financial advisors.
4. Make savings part of your monthly expenditures.
5. Save at least 10% of your income every month.
6. We cannot afford to be consumer-oriented. Do not use credit to purchase non-producing wealth items.
7. Plan for the unexpected.

Appendix A

Survey of Monetary Habits, Attitudes, and Beliefs.

Sex: Male Female

Race: _____

Age: 25 - 34 35 - 44 45 - 54 55 - 64

Marital Status: Single, Never Married

Single
Currently Married

Children: Age Group Number in group?
 0-18 _____
 19+, dependent _____
 19+, independent _____

—How many are currently college students? _____

Highest Level of Education (Circle one)
 Less than High School Graduate
 High School Graduate, no college
 Some College, no degree
 Bachelor's degree
 Graduate degree or higher

Annual Household Income (Circle one)

20,000 or less	50,100 - 55,000
20,100 - 25,000	55,100 - 60,000
25,100 - 30,000	60,100 - 65,000
30,100 - 35,000	65,100 - 70,000
35,100 - 40,000	70,100 - 75,000
40,100 - 45,000	75,100 or more
45,100 - 50,000	

Profession: _____

Employment: ___ Self-Employed
 ___ Employed by Someone Else
 ___ Unemployed
 ___ Retired

	Strongly Agree	Agree	Depends	Disagree	Strongly Disagree
Your parents are frugal.	1	2	3	4	5
You are frugal.	1	2	3	4	5
Your spouse is frugal. (If applicable)	1	2	3	4	5
You will be able to maintain your current lifestyle upon retirement.	1	2	3	4	5

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Where and/or from whom did you learn money management skills (saving, investing, etc.)?—Of those that are applicable, rate them from most to least influential. (1 being most influential).

Family Friends Church
 Self-Study High School College
 Continuing Education, Seminars

Do you retain any of the following as a financial planner?

—Check all that apply.

CPA Attorney Broker
 CFP Insurance Agent(CFC)

Circle as many of the following to indicate ownership:

Home Rental Property Motor Vehicle(s)
Business Checking Account Life Insurance
Savings Bonds Retirement Account Interest Earning Accounts
Stocks, Mutual
Funds

Will you, or have you been able to finance at least 50% of your children's college education?—(if applicable)

Yes No

—If so, through what sources?

Does your household operate on an annual budget? Yes No

Do you have a clearly defined set of lifetime financial goals? Yes No

Approximately how many hours per month do you spend planning your financial future?

Approximately what percentage of your income do you and your spouse (if applicable) save each month?

Upon retirement, what sources of income will you have?

Please indicate your reaction to the following statements.

—Definition of frugal: Wise in management of money and resources.

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Pediatric AIDS: The Viral Menace That Annihilates Our Young Children

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Abstract

Pediatric AIDS can have devastating and often fatal results on young children and their lives. This study investigates whether or not preventive measures have a positive correlation in decreased incidences of pediatric AIDS in the United States of America, with some comparisons made to Nigeria, Africa, and Bombay, and Manipur, India. Of particular interest will be clients residing within the Tarrant County, Texas area, who receive assistance from the Anne Simon Reeves Pediatric AIDS Center. A questionnaire was designed and randomly distributed to a sample population of parents and legal guardians whose children are participants in the Center's HIV/AIDS program. The questionnaire was composed of open-ended questions and interval level data pertaining to possible preventive measures concerning safe sex and/or IV drug use. It is hoped that the results of the questionnaire will give attitudinal information about safe sex and/or IV drug use preventive measures, and what types of preventive measures can be used that will ultimately be helpful in preventing pediatric AIDS.

Introduction

There are many beautiful, natural wonders in our world, and of those natural wonders, certainly children are foremost. Children bring renewed hope, joy and promise to our lives. But lurking beneath the surface is an invisible predator who is cutting our children's lives terribly short. That predator is Pediatric AIDS, "PAIDS."

According to the World Health Organization's 1996 Statistics Sheet, 1000 children, daily, worldwide, will contract HIV (9). And an estimated 1500-2000 HIV infected children are born in the United States each year (1). These particular facts are quite alarming when one considers the time, money and effort spent by the U.S. Department of Health and Human Services, and the Centers for Disease Control (CDC) promoting preventive measures concerning safer sex and intravenous drug use practices. Also, if PAIDS is a growing problem here in the United States, are Third World countries experiencing this crisis as well?

It is hoped that this present study, exploratory in nature, will provide attitudinal information about safer sex and/or IV drug use preventive measures and whether or not these measures result in a positive correlation in decreased incidences of PAIDS cases here in the USA. Included in this research is a review of the literature on the status of PAIDS in Nigeria, Africa, and Bombay, and

Manipur, India. We have much to learn from the experience of other countries with this dreaded disease. Lastly, particular attention is given to PAIDS clients, here in Tarrant County, Texas, who receive assistance from the Anne Simon Reeves Pediatric AIDS Center.

Review: General HIV/AIDS Information

In order to provide clarity for this portion of the research, a brief summary about the process of AIDS and its vocabulary, located at the end of this report, has been included. All information stated has been condensed and in no way completely describes the disease process and its many components.

Definition

Pediatric Acquired Immune Deficiency Syndrome (PAIDS) is caused by the human immunodeficiency virus (HIV), a chronic viral disease, which attacks the immune system of children (12). By killing or impairing cells of the immune system, HIV progressively destroys the body's ability to fight infections and certain cancers (13). This assault makes the infected person susceptible to opportunistic infections normally fought off by healthy immune systems (1). AIDS is spread through blood and certain other bodily fluids. In 1993, CDC revised its definition of AIDS to include all HIV-infected people who have fewer than 200 CD4+ T cells per cubic millimeter of blood (13).

HIV Types

There are two types of HIV. HIV type 1 (HIV-1) is the main cause of AIDS and can be traced back to west-central Africa. This type of HIV closely resembles the simian immunodeficiency viruses (SIV) which are found in chimpanzees. HIV type 2 (HIV-2) is the more restricted, pandemic type that is traced to West Africa and found in mangabey monkeys (5).

Transmission Modes

There are five basic modes of transmission for AIDS (10):

1. Vertical transmission- Mother to child transmission.
2. Sexual contact- Transmission through (heterosexual or homosexual) sexual intercourse.
3. Intravenous drug use- Transmission through using needles and syringes contaminated by HIV infected blood.
4. Transfusion- Transmission caused by transfusing HIV infected blood or blood products.

5. Sexual abuse of children- Transmission of HIV to a child by an infected perpetrator.

The objective of this research is to focus on the first of these modes, vertical transmission.

Vertical Transmission

A woman infected with HIV may pass the virus to her baby during pregnancy or birth. This process is known as vertical transmission and is the single, major cause of PAIDS. It appears that prior to the thirteenth week of development, the fetus does not become infected because HIV cannot enter the cells due to the fact that the CD-4 receptor needed for attachment has not yet been formed (4,15). During gestation, the virus may cross the placenta; this has been shown to occur in some cases and may happen early in gestation. The infant can also be infected during delivery by contact with maternal blood and body fluids. Studies thus far have not shown a protective effect from cesarean section delivery. The third possibility for transmission occurs postpartum via breast feeding. This has been documented in women who become infected during the postpartum period while breastfeeding and who subsequently infected their infants (1).

Statistical Ranking

In May 1996, the Pediatric AIDS Foundation reported that PAIDS was the sixth leading cause of death for children ages 1-4 years nationally (13). It has been ranked as such because it only takes two years for the virus to develop into full blown AIDS in children, as compared to the ten years development process in adults (12). There are 1300 to 2000 children born with HIV annually, in the U.S., to HIV infected mothers (9).

Physical Symptoms

Major physical manifestations, caused by opportunistic infections, surface due to compromization of the immune system. The major and most devastating symptom is HIV encephalopathy which is deterioration of neurologic development as a result of HIV invasion of the brain and central nervous system by way of infected monocytes(15).

This concludes the general overview of the HIV/AIDS process. The literature review of PAIDS in Nigeria, Africa, and Bombay and Manipur, India will follow.

Literature Review

This literature review seeks to address the issue of PAIDS in the United States, Nigeria, Africa, and Bombay and Manipur, India. The discussion will focus on the two dominant risky behaviors of adults (unsafe sexual practices and IV drug use) responsible for causing AIDS and the preventive measures undertaken by each country to reduce the spread of the disease. This does not pretend to be a comprehensive review of the literature, and the reader is referred here to some of the listed references for a fuller rendition of the information.

United States

Infected women and their children are the fastest growing population in the AIDS pandemic, according to CDC reports (8). And in 1992, risky sexual behavior became the leading cause of AIDS in American women (14). Statistically, that is an estimate of 150,000 HIV infected women, the majority being of childbearing age (8). There are numerous reasons for these facts but three major ones have been given by Dr. Michael Merson (14):

1. Women are biologically more vulnerable. As the receptive partner, women have a larger mucosal surface exposed during sexual intercourse. This fact puts them at greater risk of contracting HIV.
2. Women are epidemiologically vulnerable. Women tend to marry or have sex with older men who may have had more sexual partners.
3. Women are socially vulnerable to HIV. Men are culturally taught to be assertive sexually. Whereas, women are taught to be more passive.

Also contributing to the spread of the disease in America is intravenous drug use. Blood from an infected person can remain in or on a needle and then be transferred directly into the next person who uses it. It is common practice for a group of users to share the same contaminated needles to inject heroin or crack intravenously (2). If one of the users is infected with HIV/AIDS, every other person sharing the needle will contract the disease.

Prevention

Measures for prevention are in the form of research, health education, and treatment.

Scientists are attempting to develop a vaccine and a vaginal microbicide. They believe development of the microbicide (16,17) is further advanced than the vaccine. The delay in developing a vaccine is due to their reluctance to use a weakened, live HIV/AIDS virus for fear that it may enhance the disease poten-

tial rather than destroy it. Since HIV is a continuously mutating virus, it is difficult to locate and destroy using conventional antibodies (11). The microbicide, in the form of a gel or foam, has displayed positive results in laboratory testing. Yet, scientists are concerned about the damage the microbicide may have on the delicate tissue of the vagina and reproductive organs.

Secondly, health education through schools or community health clinics have been proven to be effective, according to the research, in delivering accurate, safer sex and/or IV drug use information to young men and women. The only positive way of eliminating the virus is through abstinence. A number of sexuality education programs, in recent years, have begun to stress abstinence. Since this measure may not be acceptable to some, safer sex and/or IV drug use preventive information must be readily available along with qualified personnel to answer possible questions. Prevention information pertaining to safer sex should stress the use of condoms (by male and females) and monogamy.

To combat IV drug abuse, treatment centers and support groups have been proven to be effective in assisting abusers and their families. One measure that the schools and police are jointly involved in is project DARE. This program allows police officers to come into the classroom and teach students about the negative effects of drugs and alcohol. It also teaches them how to resist peer pressure pertaining to drugs and alcohol.

Lastly, treatment using the ACTG 076 protocol is a preventive measure. The ACTG 076 protocol is the administering of AZT to pregnant females at the time of the HIV/AIDS diagnosis. Once diagnosed, pregnant women are given AZT 100 mg tablets five times daily during pregnancy. At the onset of and during labor, an AZT IV is administered. Once the child is born, AZT syrup is given every six hours for six weeks beginning eight to twelve hours post delivery (3). AZT has been clinically proven to slow down the disease process and possibly prevent transfer of HIV/AIDS to the fetus.

Nigeria, Africa

Most African countries are carrying the burden of HIV/AIDS 100 times heavier than industrialized countries (7). Heterosexual transmission is mostly responsible for the rapid spread of the disease. Nigerian women of childbearing age, 14-24 years, account for 50 % of all new infections. In Nigeria, which includes part of Sub-Saharan Africa, there are at least one million infected persons (18) and the number continues to increase. According to Thomas Quinn (18), infant and child mortality rates, in Africa, have exceeded previous projections by 30% due to PAIDS.

One might ask, "why is heterosexual transmission largely responsible for the spread of HIV/AIDS in this region?" Three of the possible answers are listed:

1. Nigeria is a patriarchal dominant culture, in which some men continue to practice polygamy. Their wives, on the other hand, practice monogamy.
2. As a means of economic survival, some women have multiple partners who support them and their children.
3. Increased cost, lack of availability, and poor quality of condoms.

Prevention

One possible solution, as referenced by the literature, are mass-awareness campaigns which are prevention based in Africa. They seek to educate the general public about HIV/AIDS through the various forms of media. They promote: 1. condom use and 2. monogamy. One group working to spread the prevention message is PWA (People With AIDS). Nigerians have created the Philly Lutaaya Initiative (7). This initiative enables PWA's to go public, to educate the community and to minimize stigma and discrimination about HIV/AIDS.

Another possible solution would be to persuade Nigerian society to reconsider its thoughts and actions pertaining to the subordinate status of women and their sexual rights. This may be a difficult chore to make happen, but, it would significantly aid in decreasing sexually transmitted diseases if women were given full rights to control their bodies. Research indicates that fertility and birth control success is strongly correlated with the education of women.

Bombay, India

In the birth country of Buddha, medical and health professionals are fighting a war against HIV/AIDS. There are numerous commercial sex workers (CSW) in the city's red-light district who are largely responsible for the spread of the disease (6). CSW's have placed themselves in a vulnerable situation because they are unable to negotiate safe sex and must sell sex to survive. Also responsible for the spread of HIV/AIDS are long-distance truckers. These men average 200 sexual encounters a year. This is due to their belief that the body heats up behind the engine of the truck after several hours. Therefore, they must hire CSW's to rid themselves of the harmful heat (6).

Prevention

The National AIDS Control Organisation (NACO), of Bombay, has formulated and issued guidelines for condom use, but implementation is lagging. This is due, in part, to the denial of HIV/AIDS being a problem in their conser-

vative country and to the prohibition of openly talking about sex due to cultural taboos.

Manipur, India

In northern India, injection drug users (IDU's) are responsible for the HIV epidemic. For years, many hill tribes smoked opium for medicinal and recreational reasons. Then injectable heroin flooded the state. The Indian Council of Medical Research (ICMR) estimates that in the state of Manipur there are 15,000 IDU's —mostly male students and unemployed youth (6). ICMR AIDS Unit in Manipur reports a 1 percent increase in seroprevalence rates among prenatal women (6). Thus, the first reported cases of possible PAIDS cases due to intravenous drug use.

Prevention

Needle exchange programs have been considered but is believed the enactment of such programs would signal the acceptance and promotion of illegal acts (6). Governmental drug intervention programs have been considered, but the cost of funding such programs would be extremely expensive.

Method

As previously mentioned in the abstract, in order to obtain attitudinal information about safe sex and/or IV drug use preventive measures, a questionnaire was designed and randomly distributed at the Anne Simon Reeves Pediatric AIDS Center to adults whose children participated in the summer program. The questionnaire was composed of open-ended questions and interval level data.

Subjects

The participants of this research included parents or legal guardians whose children were enrolled in the Center's summer program.

Procedure

A total of 30 questionnaires were delivered to the Center. The participants were contacted by one of the Center's nurse/case managers and asked to complete an anonymous questionnaire, which ranked their attitudes about safe sex and/or IV drug use preventive measures. Assurances were made of

each respondent's anonymity. The questionnaire was simply designed so that the average completion time would be about 10-15 minutes.

The questionnaire contained two sections. The first section was entitled "Prior to HIV/AIDS Diagnosis." This section contained four questions that asked the respondents to complete three tasks:

1. Rate their opinions on a scale:
No change 1 2 3 4 5 Drastically changed
2. Check from a list of sources how they obtained their information:
Radio ___ Television ___ Nurse ___ Doctor ___
3. Answer "yes" or "no" to a question:
Did you consider how unprotected sex could change your life?
Yes ___ No ___

The second section entitled "Post HIV/AIDS" contained eight questions which asked that respondents:

1. Rate their opinion on a scale:
How did you feel when your child was diagnosed HIV positive:
No feelings 1 2 3 4 5 Shocked
2. If applicable, answer the next questions in short sentence form:
What recommendations would you suggest about safe sex and/or IV drug use prevention?

Results

Of the thirty questionnaires delivered to the Center, about fifteen, which were representative of the average number of children ages 5-13 served by the Center, were sent out for completion. Of the fifteen sent out, only two were returned completed. Since client confidentiality had to be maintained and participation was voluntary, there was no way to ensure that all questionnaires would be completed and returned. Although two questionnaires were completed, along with suggestions for improving the dispensing of prevention information, these two respondents are not representative of the target group. Therefore, I must conclude that the measurement tool, the questionnaire, was unreliable in obtaining the desired information and has yielded inconclusive results.

Conclusion

The sole purpose of this research was to determine whether or not there was a positive correlation in decreased incidences of PAIDS cases due to safer sex and/or IV drug preventive measures here, in the USA, and in Nigeria, Africa

and Bombay and Manipur, India. Although there is a decrease here in the United States, there is an increase in Nigeria, Africa and Bombay and Manipur, India. Having completed this research paper, I am convinced that vertical transmission of PAIDS can be prevented if we, the adults, take responsibility for our actions and consider the consequences of our behavior. How can we force our children to deal with their mortality, when we as a society of adults have difficulty understanding and coping with death and dying issues?

I support the incorporation of health education programs in elementary school curriculums if they are going to provide young children the strong foundation needed to make wise decisions concerning sexuality issues and IV drug use preventive measures. The literature review speaks of the need for school based programs and states that they have been somewhat successful. In order for this information to be effective, a joining together of parents, school administrators, and medical professionals must occur.

Until a change occurs about cultural beliefs pertaining to sex and sexual rights of women in Nigeria and Bombay, I fear there will continue to be an increase in PAIDS in those countries. For decades, cultural beliefs have made it acceptable for men to have multiple partners while women were to remain monogamous. Because they have not always practiced safe sex by using condoms, once they returned home and were intimate with their wives, they transmitted the disease or diseases they contracted. Not only do the wives contract the disease but also they are vulnerable to conceiving a child. Unfortunately, if the disease contracted by the wife is AIDS, the unborn child is at risk of contracting the disease in utero or during delivery. Thus, another PAIDS client enters the world.

Uneducated and unskilled women in Nigeria and Bombay and Manipur, as well as the United States, barter sex to survive economically. These women are of childbearing age and run the risk of contracting AIDS because of the multiple partners they encounter. It is vital to our children's existence that we provide assistance to their mothers through education, job training, and community organizations so that they may improve their ability to meet their basic subsistence needs. A number of development projects in Third World countries have targeted women, to improve their education levels, coping skills, entrepreneurial abilities, marketplace acumen, etc. Again, the more that women are educated, the greater the control over child planning by the mother, and the greater the amount of control in general over her life.

According to the January 1997 Tarrant County Physicians Surveillance Report, PAIDS is on the decline here in Tarrant Count, Texas (19). This is due largely to the ACTG 076 protocol and the early diagnosis treatment of pregnant women and their newborn infants. Several major hospital and local physicians follow the ACTG 076 regimen and are observing positive results. Yet, an

increase has been noted in new HIV positive cases within the area and the Anne Simon Reeves Pediatric AIDS Center is servicing more HIV positive mothers.

As for the attitudinal HIV/AIDS questionnaire, I believe one of the reasons it was not successful in obtaining the information I sought was due to the nature of the information requested. It required respondents to answer questions of a semi-personal nature about their thoughts and actions on safe sex and/IV drug use preventive measures. Based on their answers, certain assumptions could have been drawn about their behavior. They may have realized this fact and chosen not to participate. Also to be considered is the fact that participants had no desire to respond to the questionnaire due to a lack of interest in the subject matter.

In conclusion, our children deserve to be given every chance at having a bright and meaningful future. When we adults do not consider the consequences of our actions, others suffer— especially our children. PAIDS does not discriminate by age, gender, geography or sexual orientation. In order to eliminate this predator from our society and world, we the families, educators, healthcare professionals, religious leaders and politicians must form a coalition that will work more intensely on prevention strategies. We must also be mindful of the fact that children are not responsible for preventing PAIDS. That task belongs to us, their parents and their society.

Glossary

1. **Acquired Immune Deficiency Syndrome (AIDS)** - A severe manifestation of infection with the human immunodeficiency virus (HIV).
2. **Conception** - The union of a sperm and egg that begins pregnancy.
3. **Condom** - A rubber sheath worn over the erect penis during intercourse to prevent pregnancy or sexually transmitted disease.
4. **HIV (Human Immunodeficiency Virus)** - The name for the causative agent of AIDS.
5. **Immune system** - The state of the body's natural defense to fight diseases. It is influenced by age, past illness history, diet and physical and mental health. It includes production of circulating and local antibodies and their action of mechanisms.
6. **Intravenous (IV)** - Injected into or delivered through a needle in a vein.
7. **Opportunistic infections (OI)** - A variety of diseases which occur in individuals who do not have healthy immune systems. These are microorganisms which do not usually cause diseases in a healthy individual. The OI's seen in AIDS patients include *Pneumocystis carinii*, pneumonia, massive or overwhelming herpes infections, atypical mycobacte-

ria, toxoplasmosis or chronic or overwhelming candidiasis.

8. T-Lymphocytes (T-Cells) - White blood cells that have matured in the thymus gland. There are two kinds of T-lymphocytes: helpers and suppressors. In AIDS the number of helper cells are decreased.

[GLOSSARY DEFINITIONS according to Centers for Disease Control and excerpted from the National Academy of Sciences' Confronting AIDS]

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A Follow-up Study of Participants in a Cognitive Behavior Anger Control Training Program

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Abstract

Anger is one of the emotions that all human's experience. However, the reaction to anger in the form of violence that is enacted upon another is a learned habit. The purpose of the study is to evaluate the effectiveness of the cognitive behavioral intervention of group Anger Control Training (ACT), that are offered at the SSW Community Service Clinic at UTA Arlington. The desired outcome of the ACT is to retrain the thoughts and beliefs of the participant's anger response that trigger a violent episode so that this study will show that the anger management skills learned in the ACT classes are still being utilized.

This study will attempt to contact a minimum of twenty-five past enrollees of the ACT program. This study will identify changes in past participants demographics, such as marital status, address changes, and possible legal status. The respondents will all receive the Beck Depression Inventory (BDI), Bakker Assertive-Aggression Inventory (AS-AGI), and the Trait/ State Anger Scale (TAS/ SAS).

Introduction

Despite focused attention on domestic violence, spousal abuse is still a significant social problem. An estimated "1.8 million women annually are physically abused by their husbands and that perhaps as many as 60% of all wives have been victimized at some time during their marriage" (Brannen, 1996, p 405). According to some researchers, the largest single category that police responded to is domestic disturbance. This category can account up to forty percent of the police injuries. Since 1980 treatment programs for batterers have grown in number and in scope. Initially, the focus of researchers was to develop appropriate treatment models for batterers. As a result, three models now dominate and are the Feminist model, a Psychodynamic approach, and Cognitive Behavior Therapy. The latter is the model that is employed at the University of Texas at Arlington (UTA) School of Social Work (SSW) -Community Service Clinic (CSC).

Furthermore, research has focused on outcome studies to test the efficacy of each model, using standardized pre and post test measures. Test of efficacy should also include follow-up reports to test whether treatment efforts are lasting. One central problem occurring with follow-up studies is the inability to locate subjects due to a mobile society. Also, valuable information maybe unattainable due to additional factors, such as inaccurate information supplied

by the client, ineffective record keeping of client files and to the language barrier. For instance, an Asian respondent, after being located, stated that he/she did not know or understand enough English to respond to the questionnaire over the telephone. Other dilemmas present at the beginning of a study are the tendency of respondents to minimize self-reporting of responses to scales. "Male batterers are shown to be least accurate in reporting incidence of violence due to the likelihood that will deny or minimize their abusive behavior" (Edelson, 1986, p 377). All of these factors can skew the results of the survey.

The Anger Control Training (ACT), began as a multi-couple group treatment for anger management at the UTA's SSW - Community Service clinic by Jeanne P. Deschner in 1983. This model, which has undergone some modification, is still in use at the CSC. In Deschner's book, The Hitting Habit, (1984) training focused on educating facilitators about anger management. The abusers along with their partners were also taught to recognize anger as a response to an event or emotion. Training consisted of ten weekly sessions lasting two and a half hour each. Initially, the men and women were placed in separate groups. Skills were taught through role playing along with the discussion of feelings, of specific problems, and events. The group format provided alternate emotional support and sources of feedback. A cognitive behavioral approach was implemented to improve communication skills and in controlling anger. The result of treatment found a reduction of violence with an increase in marital satisfaction. Treatment components included assertion training, cognitive realignment, social interaction skills, and communication skills that were targeted at anger management. A six month follow-up concluded that at least half remained violence free.

Outcome studies of treatment programs vary in the criteria of success and length of follow-up. Success may be viewed anywhere from a reduction of violence, with leniency given to verbal abuse, to the requirement of total elimination of spousal abuse. Length of follow-up on studies range from one to thirty-six months. Treatment programs also varied in length from ten weeks to six months. Follow-up studies also divulged that participants were not randomly assigned to treatment or control groups.

The CSC uses a waiting list as a control group. The CSC conducts ACT sessions three times a year, with up to fifteen participants per session, and on a first come first serve basis. Cognitive behavioral techniques are employed in ACT, where the focus of the training is to control one's anger by taking responsibility for it, along with improving communication skills. Retaining control is accomplished through behavioral contracts, communication training, problem solving, coping skills, and assertiveness training. In 1997, Jordan, Barrett and Cobb an analysis from ACT groups that had been collected in the past four

years. Included in the sample size of the study were 204 adults, with males composing 65.2% of the group. Only 21.8% of the group were self referred, the remanding 78.2% was referred by civil courts. Only twenty of the 204 clients that made up the sample, had both pre and post test scores. In reporting Frequency of all Violent Incidents, 20 adults reported they had not engaged in further violence. The results of the CSC study found the "measurement of change as a result of group treatment was inconsistently measured" (Jordan, 1997, p 4), due the lack of routine administration of standardized tests. Although, the results revealed an inconsistency of data collection by facilitators, "the study demonstrated a significant change in participants state anger following treatment" (et al, 1997, p 5), demonstrating the participants ability to decreased their SAS scores from three to six points.

Purpose

The purpose of this study is to investigate the long term effects of ACT on participants by using a follow-up study to see if batterers maintained their gains after treatment. Such follow-up studies are useful in determining if immediate changes in treatment have a last effect.

Methods

The goal of this study was to survey twenty-five individuals who have completed the ten sessions from 1993 to 1997. Twenty people were located who agreed to respond to the questionnaire. They make up the sample for this study. More than 184 telephone contacts were attempted with 75 past clients. From this group, the data analyzed will included the re-administering of standardized test for the comparison to post-test clinic scores.

The questionnaire was constructed from a group of standardized measures, which were administered over the telephone. Length of interview lasted from twenty minutes to one hour, depending upon the participant. Current phone number's of past participants that have moved are researched using their last know contact and by Cole's Cross - Directory for Arlington or Polk's Cross - Reference Directory for Fort Worth Tarrant County, along with local phone books.

The standardized measures administered were the Beck's Depression Inventory (BDI), (Beck, 1978) a twenty-one item scale. This scale determines the respondents current feelings regarding themselves and if they may be suffering from depression. The Bakker Assertive - Aggressive Inventory (AS-AGI) which is a thirty-six item scale (Bakker, 1978, p 277). The Trait /State Anger Scale (TAS /SAS) each scale contains fifteen items each (Spielberger, 1983). The SAS deter-

mines the respondents subjective feelings of rage, irritation, tension and annoyance. The TAS defines the respondents personal views toward anger, which is a personality trait. Scoring ranges from 15 to 60, with a higher the score reflecting greater anger. These are many of the same instruments used when respondent entered ACT. Respondents are asked to self-rate their Frequency of Violent Incidents, to state their marital status, if there has been a change of address, if they are on probation, their date of birth, and then they are given the opportunity to comment about ACT.

The ethnic make-up of the respondents is fourteen Caucasians, five African Americans, one Hispanic, and one Asian. The mean age of respondents is 39.3 years, with a range of 19 to 61. The participants included fourteen males and six females. Marital status revealed five single respondents, eight married, six divorced, no widowed, and one separated. Self-reports from respondents revealed four participants on probation. Self-reports from respondents revealed five participants on probation, and nine individuals were court mandated to attend ACT.

Data Analysis: SPSS 7.5 for Windows was used to analyze the data. Current scores were compared to the scores at the conclusion of ACT to determine change.

Results

Sample: A data base was constructed from client files, listing client identification numbers, names and address, telephone numbers, date of birth, and the last four numbers of participants social security numbers. Verification of an individual on parole in Tarrant county requires full names, birth dates and social security numbers, full disclosure of this information was missing from many of the client files.

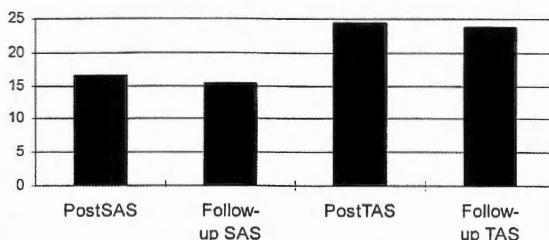
Seventy-five clients who had completed ACT between 1997 and 1994 were selected to make up sample. More than 184 telephone contact attempts were made to ACT participants. Of the 75 selected, only 20 participants completed the survey. Of the 20 respondents, only eight had both the pre and post test scores for SAS and TAS, required for the evaluation of the program.

The breakdown of each semester is as follows, the Spring 97 session had nine clients with eight completing the course. Of the eight, five clients were contacted, one refused to participate, one survey was sent through the mail, two clients were not found due to an address change. The Fall 96 session had sixteen clients with eight clients completing the course. Of the eight, five were surveyed. The total of non-working home phone numbers was five, with one confirmed address change. From the Spring 96 group that completed the course, four were surveyed. Three had confirmed address changes, with one stating

that he/she did not understand the question because of the lack of understanding the English language. One completed the survey though the mail. The other was unreachable because he/she worked out of town. Summer 96 has seven clients, from which three were surveyed. This group has five telephone numbers that were no longer in service. Fall 95 has ten clients that remain unavailable, which yielded seven non-working home telephone numbers. Spring 95 had fourteen clients, with two clients surveyed and seven non-working home telephone numbers. One of the Spring 95 past participants stated that he/she was not interested in participation in this study. Summer 95 had twelve clients, I surveyed two clients and found seven no longer in service phone numbers. Spring 94 had nine clients with five non-working phone numbers and one partial survey.

Figure 1 shows follow-up on SAS and TAS scores which remain lower than post-SAS and TAS scores, and that respondents are able to manage their feelings of annoyance and rage. The mean of the eight respondents is 15.25, which also indicates the ability to control their anger.

Mean Scores for SAS / TAS



The TAS displays an individual's stable personality trait, exhibiting the individuals self beliefs. The mean score for the eight respondents is 23.86, this shows the ability of the individual to change a well developed belief. A t-test paired sample statistic was used to test the difference between means scores of each post test and follow-up test. The results did not prove to be statistically significant.

The mean for the Beck's (BDI) for entire group surveyed is 8.2, which reveals normal levels of emotion health. (Scores :11-16 Mild, 17-20 clinical depression, 21-30 moderate, 31-40 severe, over 40 extreme depression).

The Bakker AS-AGI consists of two eighteen items scales that can be used together or separately. The sum of the scales range from 18 to 60, a higher score indicates that the individual is less likely to exhibit assertiveness or aggressiveness. The mean for AS is 57.38 and the mean for AGI is 53.75 both are with in normal ranges, displaying that aggression is not the dominating behavior in the individuals life.

Conclusion

The data indicated that the respondents maintained gains made in treatment. The results are graphically displayed in Figure 1, which outlines the differences. The ACT participants continue to use the skills learned. Overall, there was no depression. The assertive scores were higher and aggressive scores were lower.

The study points out how difficult follow-up is for these clients and researcher. Some respondents were weary of strangers asking questions, others enjoyed having someone to talk to.

All gave an opinion about the anger control training that they participated in. The overall impression is they found it useful along with informative.

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APPENDICIES

Interview Format for ACT

Hello, may I speak to _____. My name is _____, I am conducting a follow-up study on the Anger control Training that you participated in at the UTA Community Service Clinic. The survey will take approximately twenty minutes to thirty minutes complete.

Let's begin with determining the number of violent incidents, you were involved with, this includes physical and or emotional abuse.

Frequency of Violent Incidents

Which of the following words or group of words best describes the frequency of violent incidents you have engaged :

Daily, Weekly, Monthly, Twice a Year, Once a Year, Once, Never.

AS-AGI (*Baker Assertiveness-Aggressiveness Inventory*)

You may want paper and pencil to jot down notes for yourself. I will wait if you want to collect them. After each of the statements, please answer with one of the following responses :

1 = Almost always; 2 = Frequently; 3 = Occasionally; 4 = Sometimes; 5 = Almost never.

- ___1. You have set aside the evening to get some necessary work done. Just as you get started some friends drop over for a social visit.
- You welcome them in and postpone what you had planned to do.
- ___2. You are standing in line when someone pushes ahead of you.
+ You tell the person to get back in line behind you.
- ___3. A friend or relative asks to borrow your car or other valuable property but you would prefer not to lend it to them. - You lend it them anyway.
- ___4. A person who has kept you waiting before is late again for an appointment.
- You ignore it and act as if nothing has happened.
- ___5. Someone has, in your opinion, treated you unfairly or incorrectly.
+ You confront the person directly concerning this.
- ___6. Friends or neighbors fail to return some items they have borrowed from you.
+ You keep after them until they return them.
- ___7. Others put pressure on you to drink, smoke pot, take drugs, or eat too much.
+ You refuse to yield to their pressure.
- ___8. Another person interrupts you while you are speaking.
- You wait until the other is finished speaking before you go on with

your story.

- ___9. You are asked to carry out a task that you do not feel like doing.
+ You tell the other that you don't want to do it.
- ___10. Your sexual partner has done something that you do not like.
- You act as if nothing bothersome has happened.
- ___11. A salesperson has spent a great deal of time showing you merchandise but not of it is exactly what you want.
- You buy something anyway.
- ___12. You are invited to a party or other social event, which you would rather not attend.
- You accept the invitation.
- ___13. In a concert or a movie theater a couple next to you distract you with their conversation.
+ You ask them to be quiet or move somewhere else.
- ___14. In a restaurant you receive food that is poorly prepared.
+ You ask the waiter or waitress to replace it.
- ___15. You receive incorrect or damaged merchandise from a store.
+ You return the merchandise.
- ___16. A person who seems a lot worse off than you asks you for something you could easily do without but you don't like to.
- You give the person what he/she asks for.
- ___17. Someone give you - unasked for- a negative appraisal of your behavior.
+ You tell the other you are not interested.
- ___18. Friends or parents try to get information from you that you consider personal.
- You give them the information they want.
- ___19. You have been appointed to a newly formed committee.
+ You take a leadership role.
- ___20. You are in a bus or plane sitting next to a person you have never met.
+ You strike up a conversation.

- ___21. You are a guest in a home of a new acquaintance. The dinner was so good you would like a second helping.
+ You go ahead and take a second helping.
- ___22. You are being interviewed for a job you really want to get.
- You undersell yourself.
- ___23. You are meeting or greeting several people.
+ You make physical contact with each other in turn either by hugging, putting an arm around their shoulders, or slapping their backs.
- ___24. You have observed that someone has done an excellent job at some thing.
- You don't tell that person about it.
- ___25. In a store or restaurant the personnel are very busy and many customers seem to be waiting a long time for service.
+ You manage to get service ahead of other customers.
- ___26. You observe some behave in a suspicious manner.
- You don't do anything because it is none of your business.
- ___27. You have parked your car but notice that you do not have the correct change for the parking meter.
+ You ask a passer-by for the change.
- ___28. Someone has done or said something that arouses your curiosity.
- You refrain from asking questions.
- ___29. You have observed certain behaviors of a friend or acquaintance that you think need to be changed. You tell the other person about this as soon as possible.
+ You tell the other person about this as soon as possible
- ___30. You would like to get a raise but your boss has said nothing about it.
- You wait for your boss to bring the matter up.
- ___31. During a social visit with a group of friends everyone participates actively in the conversation.
+ You dominate the conversation most of the time.

- ___32. During a discussion you believe that you have something worthwhile to contribute.
+ You don't bother to state it unless the others ask you to give your opinion.
- ___33. You have an opportunity to participate in a lively, no-holds barred debate.
- You remain a listener rather than a participant.
- ___34. You want a favor done by a person you do not know too well.
- You prefer to do without rather than ask that person.
- ___35. You have moved into a new neighborhood or started a new job and you would like to make social contacts.
- You wait for other to introduce themselves.
- ___36. You see an opportunity to get ahead but know it will take a great deal of energy.
+ You take the opportunity and forge ahead.

BDI (*Beck Depression Inventory*)

For the following 21 questions, Pick out the ONE statement in each group of four statements that best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY.

1. 0. I do not feel sad.
 1. I feel sad
 2. I am sad all the time and I can't snap out of it.
 3. I am so sad or unhappy that I can't stand it.

2. 0. I am not particularly discouraged about the future.
 1. I feel discouraged about the future.
 2. I feel I have nothing to look forward to.
 3. I feel that the future is hopeless and that things can't improve.

3. 0. I do not feel like a failure.
 1. I feel I have failed more than the average person.
 2. As I look back on my life, all I can see is a lot of failures.
 3. I feel I am a complete failure as a person.

4. 0. I get as much satisfaction out of things as I used to.
 1. I don't enjoy things the way I used to.
 2. I don't get real satisfaction out of anything anymore.
 3. I am dissatisfied or bored with everything.

5. 0. I don't feel particularly guilty.
 1. I feel guilty a good part of the time.
 2. I feel guilty most of the time.
 3. I feel guilty all the time.

6. 0. I don't feel I am being punished.
 1. I feel I may be punished.
 2. I expect to be punished.
 3. I feel I am being punished.

7. 0. I don't feel disappointed in myself.
 1. I am disappointed in myself.
 2. I am disgusted with myself.
 3. I hate myself.

8. 0. I don't feel I am any worse than anybody else.
 1. I am critical of myself for my weaknesses or mistakes.
 2. I blame myself all the time for my faults.
 3. I blame myself for everything bad that happens.

9. 0. I don't have any thoughts of killing myself.
 1. I have thoughts of killing myself, but I would not carry them out.
 2. I would like to kill myself.
 3. I would kill myself if I had the chance.

10. 0. I don't cry more than usual.
 1. I cry more now than I used to.
 2. I cry all the time now.
 3. I used to be able to cry, but now I can't cry even though I want to.

11. 0. I am no more irritated by things than I ever am.
 1. I am slightly more irritated now than usual.
 2. I am quite annoyed or irritated a good deal of the time.
 3. I feel irritated all the time now.

12. 0. I have not lost interest in other people.

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1. I am less interested in other people than I used to be.
 2. I have lost most of my interest in other people.
 3. I have lost all of my interest in other people.
13. 0. I make decisions as well as I ever could.
1. I put off making decisions more than I used to.
 2. I have greater difficulty in making decisions than before.
 3. I can't make decisions at all anymore.
14. 0. I don't feel that I look any worse than I used to.
1. I am worried that I am looking old or unattractive.
 2. I feel that there are permanent changes in my appearance that make me look unattractive.
 3. I believe that I look ugly.
15. 0. I can work about as well as before.
1. It takes an extra effort to get started at doing something.
 2. I have to push myself very hard to do anything.
 3. I can't do any work at all.
16. 0. I can sleep as well as usual.
1. I don't sleep as well as I used to.
 2. I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
 3. I wake up several hours earlier than I used to and can't get back to sleep.
17. 0. I don't get more tired than usual.
1. I get tired more easily than I used to.
 2. I get tired from doing almost anything.
 3. I am too tired to do anything.
18. 0. My appetite is no worse than usual.
1. My appetite is not as good as it used to be.
 2. My appetite is much worse now.
 3. I have no appetite at all anymore.
19. 0. I haven't lost much weight, if any lately.
1. I have lost more than (5) five pounds.
 2. I have lost more than (10) ten pounds.

3. I have lost more than (15) fifteen pounds.
20. 0. I am no more worried about my health than usual.
1. I am very worried about physical problems such as aches and pains; or upset stomach; or constipation.
 2. I am very worried about physical problems and it's hard to think about anything else.
 3. I am so worried about my physical problems that I cannot think about anything else.
21. 0. I have not noticed any recent change in my interest in sex.
1. I am less interested in sex than I used to be.
 2. I am much less interested in sex now.
 3. I have lost interest in sex completely.

SAS These are statements that people have used to describe how people feel. Please answer how you feel at this moment with one of the following responses :

1 = Not at all ; 2 = Somewhat ; 3 = Moderately so ; 4 = Very much

- ___ I am mad
- ___ I feel angry
- ___ I am burned up.
- ___ I feel irritated.
- ___ I feel frustrated.
- ___ I feel aggravated.
- ___ I fell like I'm about to explode.
- ___ I feel like banging on the table.
- ___ I feel like yelling at someone.
- ___ I feel like swearing.
- ___ I am furious.
- ___ I feel like hitting someone.
- ___ I feel like breaking things.
- ___ I am annoyed.
- ___ I am resentful.

*TAS*The following statements are used to describe oneself. Please indicate how you generally feel by answering each statement with one of the following responses :

1 = Almost never; 2 = Sometimes; 3 = Often; 4 = Almost always.

- ___ I have a fiery temper.
- ___ I am quick-tempered.
- ___ I am a hotheaded person.
- ___ I get annoyed when I am singled out for correction.
- ___ It makes me furious when I am criticized in front of others.
- ___ I get angry when I'm slowed down by others' mistakes.
- ___ I feel infuriated when I do a good job and get a poor evaluation.
- ___ I fly off the handle.
- ___ I feel annoyed when I am not given recognition for doing good work.
- ___ People who think they are always right irritate me.
- ___ When I get mad, I say nasty things.
- ___ I feel irritated.
- ___ I feel angry.
- ___ When I get frustrated, I feel like hitting someone.
- ___ It makes my blood boil when I am pressured.

This concludes the survey, thank you very much for your time. If you have any questions please contact _____ at the UTA Community Service Clinic. (817) 272-2165

*Table 1. ACT by Semester

ACT FOLLOW -UP SURVEY								
Semester	Enrolled	Attempt contact	Completed course	Surveyed	Survey Mailed	Non-participants	Non-working numbers	Telephone Contact attempts
Spring 97	9	8	8	5	1		2	32
Fall 96	16	8	8	5			5	33
Spring 96	12	8	8	4	1	1	3	43
Summer 96	7	7	5	3			5	12
Fall 95	10	10					7	25
Spring 95	14	14		2		2	8	19
Summer 95	12	12		1			7	16
1994	9	9		1			5	4
Total	89	75		21			42	184

Definitions

Abuse - the intended psychological as well as physical hurt...(and) includes threats, with holding of affection, and sexual coercion" (Saunders, 1989, p. 78-79).

Aggression - 1. The act of commencing hostilities or invasion; an assault. 2. The habit or practice of launching attacks. 3. Psychoanalysis. Hostile action or behavior. (Morris,(Ed),1973, p. 24). It includes both physical battering and psychological abuse.

Anger - defined as "an emotional state consisting of feeling of irritation, annoyance, fury, and rage along with heightened activation of the autonomic nervous system and the endocrine system, tension in the skeletal musculature, antagonistic thought patterns, and at the same time aggressive behaviors" (Johnson, 1990, 8).

Battering - "a specialized term for assaults against family members of intimates" (Deschner, 1984, p.2).

Perpetrator - "an individual identified by the court as having an anger problem and sentenced to court mandated treatment" (Jordan, 1997, p. 30-31)

Physical battering - "any attempt to intentionally cause physical hurt or to restrain another person, whether or not injury actually results" (Saunders, 1989, p. 78-79).



3. I have lost more than (15) fifteen pounds.
20. 0. I am no more worried about my health than usual.
1. I am very worried about physical problems such as aches and pains; or upset stomach; or constipation.
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- ___ I am annoyed.
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- ___ I get angry when I'm slowed down by others' mistakes.
- ___ I feel infuriated when I do a good job and get a poor evaluation.
- ___ I fly off the handle.
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- ___ People who think they are always right irritate me.
- ___ When I get mad, I say nasty things.
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Fall 95	10	10					7	25
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1994	9	9		1			5	4
Total	89	75		21			42	184

Table 2 : Frequency

Frequency of Violent Incidents			
	Frequency	Percent	Valid Percent
Never	12	57.1	60.
Once	1	4.8	5.0

Table 2 : Frequency

Frequency of Violent Incidents			
	Frequency	Percent	Valid Percent
Never	12	57.1	60.
Once	1	4.8	5.0
Once a Year	1	4.8	5.0
Twice a Year	1	4.8	5.0
Monthly	4	19.0	20.
Weekly	1	4.8	5.0
Daily	0		
Total	20		
	n = 20	Mean = 5.65	Standard Deviation = 1.8717

T-Test for Frequency of Violence
One-Sample Statistics

	N	Mean	Standard Deviation	Std. Error Mean
Frequency of Violent Incidents	19	5.7895	1.8129	.4159

Table 3 Marital Status

	Marital	Status	of ACT	Participants		
Semester	Single	Married	Divorced	Widowed	Separated	Total
Spring 97	2	2	1			5
Fall 96	1	1	3			5
Spring 96	1	1			1	4
Summer 96	1	1	1		1	3
Fall 95						
Spring 95	1	1				2
Summer 95		1				1
1994						
	Frequency 5	Frequency 8	Frequency 6	Frequency 0	Frequency 1	
	Valid Percent 25.0	Valid Percent 40.0	Valid Percent 30.0	Valid Percent	Valid Percent 5.0	

Anger Control Training

Name _____
 Address _____
 Phone _____ Work _____

<u>Session</u>	<u>Date</u>	<u>Attendance</u>
1. Intro/Time Out	_____	_____
2. Nature of Anger	_____	_____
3. Cognitive Real	_____	_____
4. Assertion	_____	_____
5. Others Anger	_____	_____
6. Correction	_____	_____
7. Jealousy	_____	_____
8. Pleasers	_____	_____
9. Negotiation	_____	_____
10. Prevention	_____	_____

Program Completion _____
 Facilitator _____

