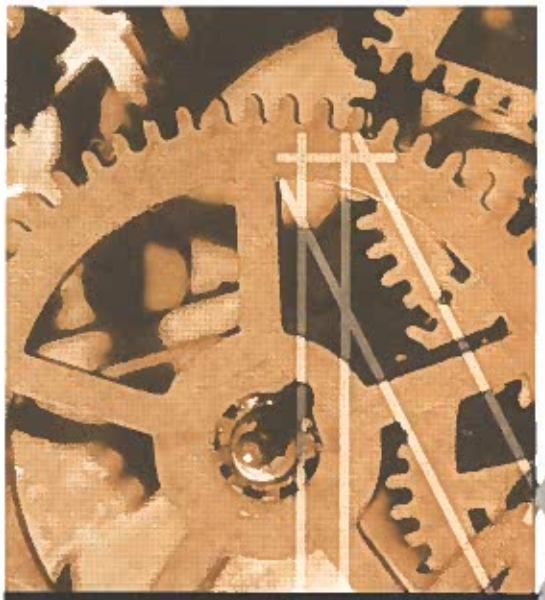


Fall 1998

JOURNAL OF RESEARCH REPORTS

McNair Scholars Program

TRIO

A FEDERALLY FUNDED PROGRAM

WICHITA STATE UNIVERSITY

WICHITA STATE UNIVERSITY

McNAIR SCHOLARS PROGRAM

JOURNAL OF RESEARCH REPORTS

FALL 1998

EDITORS

Jan Petersen

Stephen Johnson

Dan Callahan

The *Journal of Research Reports*, Fall 1998, Vol. 3, is published annually by the Wichita State University McNair Scholars Program, 1845 Fairmount, Wichita, Kansas 67260-0199.

McNair Scholars Program Staff Members

Larry Ramos, *Director*

LaWanda Holt-Fields
Program Counselor

Linda Lindsly, *Secretary*

Jan Petersen, *Graduate Assistant*

Staff Members

Larry A. Ramos, Director

LaWanda Holt-Fileds, Program Counselor

Linda Lindsly, Secretary

Jan Petersen, Graduate Assistant

Stephen Johnson, Writing Tutor

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

Research reports are accepted from students participating in the WSU McNair Scholars Program. Reproduction of material in this publication is hereby authorized. No responsibility for the views expressed by the authors in this document is assumed by the editors, professional staff, the McNair Scholars Program, or Wichita State University.

The WSU McNair Scholars Program is 100% supported by funds from the United States Department of Education under the Ronald E. McNair Post-baccalaureate Achievement Program.

Table of Contents

Journal of Research Reports **Fall 1998**

Research Papers

Research Summaries

On behalf of the staff and students of the McNair Scholars Program, I am pleased to present this issue of the *Journal of Research Reports*. The reports included in this journal represent a broad range of disciplines and subject matter. Over the past year, the undergraduate students who are featured in this journal have worked tirelessly on their research and are to be congratulated for their efforts. It has been our pleasure to watch these students grow into promising graduate students and future scholars.

Many thanks are in order to all the faculty who volunteered to serve as research mentors to our students. For without them, achieving this lofty goal would be impossible. I hope that many more faculty are inspired to become involved with this worthy endeavor.

Larry A. Ramos

Larry Ramos
Director

I congratulate all of the McNair Scholars who participated in the *Journal of Research Reports*, 1998. The students' research projects reflect dedication, hard work, and commitment to excellence. Three students' research manuscripts were chosen this year for full publication in this journal; the remaining students submitted summaries of their research projects. While persevering through busy schedules and challenging circumstances, all of the scholars produced excellent work. We commend them!

It has been my pleasure to work with the McNair Scholars. They represent the leadership of tomorrow. Carry on, scholars!

Jan A. Petersen

Jan Petersen
Graduate Assistant

Jan Austin
WSU McNair Scholar

SEX DETERMINATION BY PCR IN A MOUSE MODEL OF MATERNAL PHENYLKETONURIA

Jan Austin

WSU McNair Scholar

J.D. McDonald, PhD, Associate Professor of Biological Sciences

Sangbun Cho, Graduate Research Assistant, Biological Sciences

WSU Faculty Research Scholars

Abstract

Maternal phenylketonuria (MPKU) is a disease that is fully dependent on the mother's genotype and diet. If the mother is not on a phenylalanine (Phe) restricted diet, Phe blood levels accumulate to toxic concentrations causing teratogenic effects on the developing fetus. With the PKU mouse line, BTBR-Pah-Enu2, we are undertaking a nutritional study exploring the fetal developmental outcome in the presence of varied levels of maternal blood Phe. As part of our assessment of fetal development outcome, several parameters relating to size and weight are being used. Since these factors vary greatly according to sex, an important tool in this analysis is determining the sex of the fetuses. Our sex determination protocol uses a multi-step process which leads to the isolation and quantification of mouse genomic DNA. This genomic DNA is then used as a template for the polymerase chain reaction (PCR) method to amplify the SMC gene. Polyacrylamide gel electrophoresis is then used to visualize the amplification products by UV light after staining with ethidium bromide. The PCR method is used to detect the presence of the X and the Y chromosome, both of which produce distinct amplification products: a single band for the female (representing the X chromosome) and two bands for the male (one band each for the Y and the X chromosomes). The null hypothesis of this study is that there will be no effect of elevated maternal blood Phe on fetal development.

Phenylketonuria (PKU) is a heritable autosomal recessive disease resulting in a defect in amino acid metabolism (Folling I., 1994). A mutated phenylalanine hydroxylase (PAH) gene leads to a defective or absent phenylalanine hydroxylase (Pah) enzyme (Lidsky et al., 1984). Pah is the first enzyme in the metabolic pathway that converts the amino acid phenylalanine (Phe) to the amino acid tyrosine (Tyr). Without this reaction, the pathway is blocked, and the Phe and its metabolites accumulate in the tissues and blood. At high levels, Phe and its primary metabolite phenylpyruvic acid are toxic; a serious target of this toxicity is the central nervous system. Along with the build-up of Phe, this metabolic imbalance also leads to tyrosine deficiency, which effects the synthesis of neurotransmitters vital for the development of the brain. The untreated PKU individual suffers mental retardation, microcephaly, and impaired pigmentation. With the development in the 1960s of the Guthrie Assay, a test for PKU given shortly after birth and the development of a successful dietary treatment, the pathology of PKU has been greatly reduced. If the blood test results are positive, the infant is immediately put on a Phe-restricted diet that will continue until around the age of nine, when the central nervous system is fully developed. This strict dietary control of the Phe limits and maintains the Phe level to that which is just sufficient for protein synthesis.

With the success of the strict dietary treatment for classical PKU, a second aspect of the disease was discovered that has come to be termed maternal phenylketonuria (MPKU). MPKU is a disease solely dependent on the mother's genotype and diet. If the PKU mother is on a Phe-limiting diet and thereby maintains normal Phe levels throughout pregnancy, fetal development is normal. However, if the PKU mother is not on the Phe diet, the high concentration of blood Phe has teratogenic effects on the fetus. These teratogenic effects can lead to severe mental retardation, microcephaly, growth retardation, congenital cardiovascular defects, low birth weight, spontaneous abortion, and stillbirth (Fisch, Tagatz, & Stassart, 1993; Koch et al., 1996; Levy & Ghavani, 1996) (see Fig. 1).

Since this syndrome is sufficiently uncharacterized, major efforts are under way to better understand its biochemical mechanisms and parameters.

The limitations of working with human PKU patients have made it difficult to study PKU in humans. Genetic animal models have been successfully developed with genetics, biochemistry, and physiology similar to human PKU (Fisher, 1997). The BTBR-Pah-Enu2 mouse line shows the same features as human classical PKU and is the preferred animal model for these studies (Shedlovsky, McDonald, Symula, & Dove, 1993) (see Fig. 2).

The relationship between the Phe levels of the mother and the teratogenic effects on the fetus have been determined to be strongly associated (Levy & Ghavani, 1996; Koch et al., 1986). This lab conducted a nutritional study of MPKU to further characterize this relationship through a dose-response analysis. This study investigated the effect of maternal dietary Phe exposure on several parameters of fetal development. As a vital component of this analysis, sex determination is necessary for comparisons of males and females within the control group and each test group. This determination was accomplished by the analysis of genomic mouse DNA using a PCR protocol to amplify the SMC gene sequence on the X and the Y chromosomes (see Fig. 3).

Gel electrophoresis was used to visualize the amplification products in order to determine the presence of the X and/or the Y chromosomes and thereby to reveal the sex of the fetuses. This data was then used as a tool for the comparisons in the parameters by sex with the control and test groups. Our null hypothesis was that there would be no effect of elevated maternal blood Phe on fetal development.

Materials and Methods

The BTBR-Pah-Enu2 females were bred in the lab, kept in controlled conditions and monitored throughout pregnancy. The Phe levels for the T0 control group were maintained at normal concentrations. The Phe levels for the T1, T2, and T3 test groups were varied with increasing concentrations from T1 up to T3. The mothers were sacrificed and the litters were taken at 18 days

Figure 1

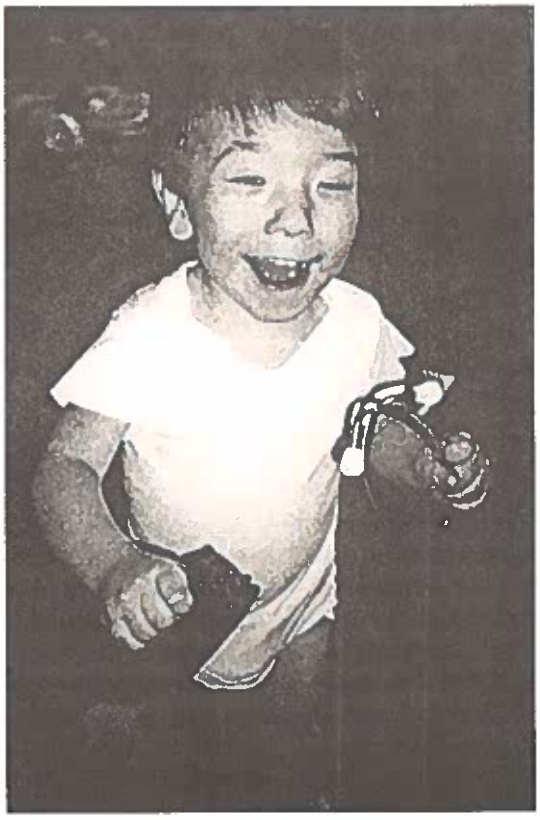


Figure 2

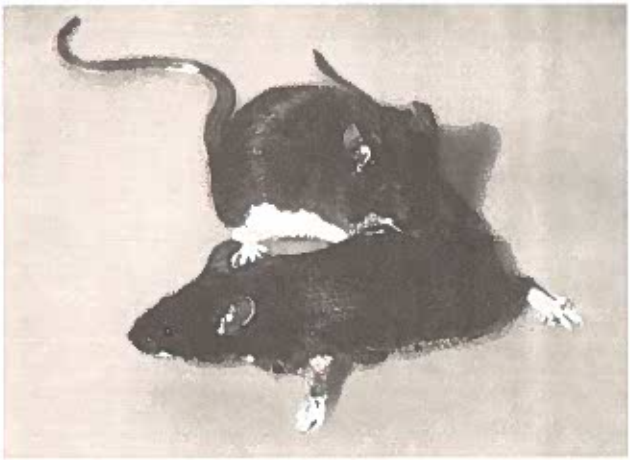
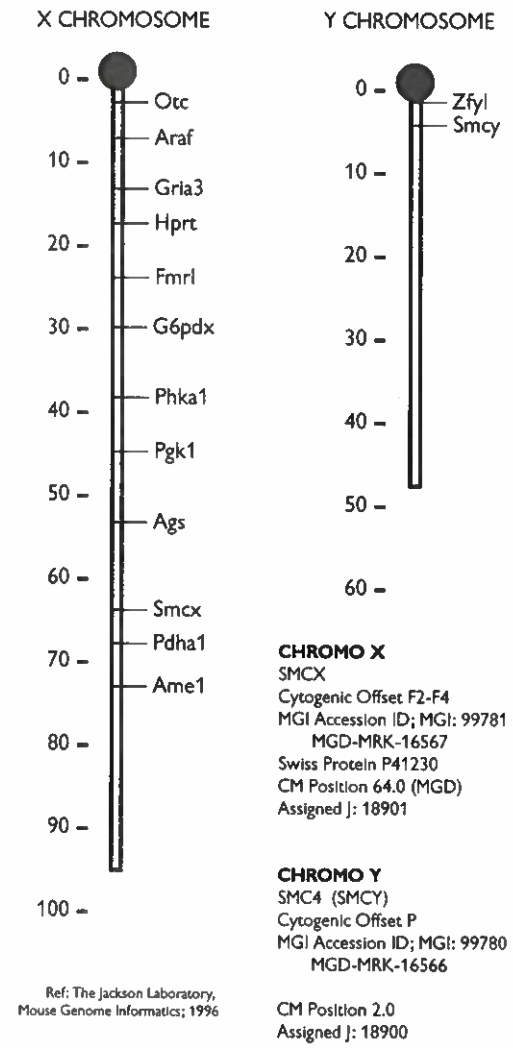


Figure 1: This MPKU individual was born at term and weighed 2000 grams. He has microcephaly and a congenital heart defect that was surgically repaired. At age two and a half, he has just learned to walk, does not yet talk, and is severely mentally impaired. His mother was not on the low-Phe diet during pregnancy (Schraeder, 1993).

Figure 2: BTBR-Pah-Enu2 mouse line used in the MPKU nutritional studies.

Figure 3



gestation. Comparisons of fetal development were made as the fetuses were extracted from the uterine horn and examined. Parameters established were head circumference, body length, and weight. Any physical abnormalities were observed at this time and recorded. The mother and fetuses were genotyped and a complete amino acid analysis was run. A fetal tissue sample (head) was removed and immediately frozen in liquid nitrogen for the sex determination procedure. The PCR based procedure uses genomic DNA in a process involving (1) the preparation of genomic DNA by isolation, extraction, purification, and quantification, followed by (2) PCR amplification and (3) polyacrylamide gel electrophoresis to analyze the gel (amplification products).

Materials:

Liquid nitrogen

Digestion buffer (24)

100 mM NaCl

10 mM Tris-Cl

25 mM EDTA

1.5% SDS

0.1 mg/ml Proteinase K

Ice-cold phosphate-buffered saline

25:24:1 phenol/chloroform/isoamyl alcohol

7.5 M ammonium acetate

100% and 70% ethanol

TE buffer, pH 8.0

0.1% (w/v) sodium dodecyl sulfate (SDS; optional) 1 mg/ml Dnase-free Rnase (optional)

Frozen fetal mouse tissue (head)

DNA Isolation—Step 1

The cell preparation begins from whole tissue:

1. Weigh samples
2. Grind tissue with pre-chilled mortar and pestle
3. Suspend powdered tissue in 1.2 ml digestion buffer per 100 mg tissue

The following step was for cell lysis and digestion:

4. Samples incubated with rocking at 50° C overnight in tightly capped tubes wrapped in parafilm

DNA Extraction—Step 2

5. Thoroughly extract samples with equal volume of phenol/chloroform/isoamyl alcohol (25:24:1)
6. Centrifuge 10 minutes at room temperature at # x g
7. Repeat three times for DNA extraction

DNA Purification—Step 3

8. Transfer aqueous layer of last extraction to new tube and add ?? volume of 7.5 M ammonium acetate and 2x original volume of 100% cold ethanol. Mix gently but thoroughly and DNA will form a stringy precipitate.

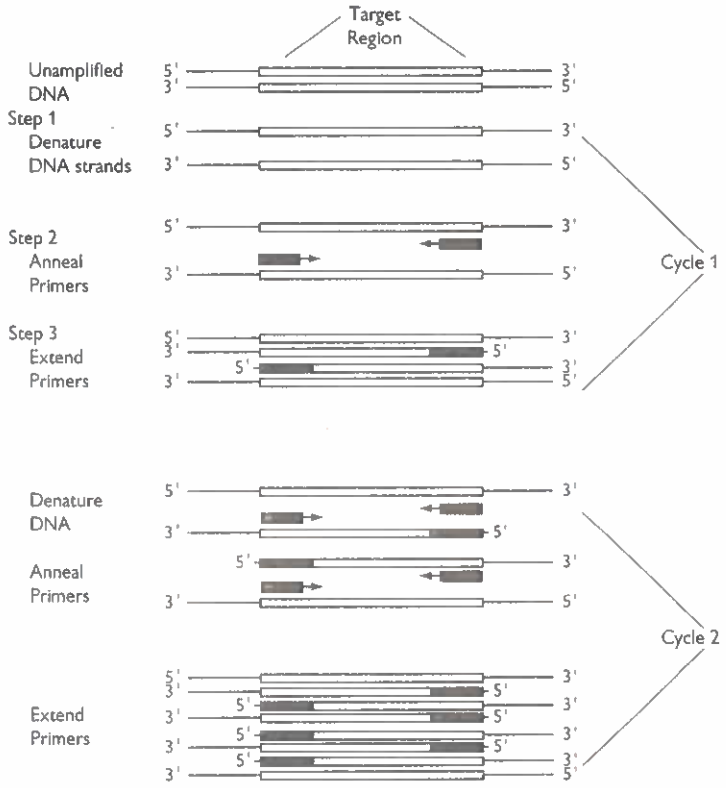
9. Recover DNA by centrifugation at # x g for 2 minutes
10. Rinse pellet with cold 70% ethanol
11. Decant ethanol and air dry pellet
12. Resuspend DNA in TE buffer until dissolved (DNA may be shaken gently at room temperature or at 50° C)
13. Store at 4° C until use

DNA Quantification—Step 4

Estimate concentration of DNA in sample by UV absorption spectrophotometry. An absorbance peak of nucleac acids is at 260 nm and is quantitative for relatively pure nucleic acid solution. An absorbance peak for proteins is at 280 nm and the absorbance ratio of 260/280 nm indicates the purity of the nucleic acid; 1.8 or higher is indication of sufficiently pure DNA for most forms of analysis.

1. DNA dilution of 1:200; 2 ul DNA + 398 ul TE buffer
2. Blank of 400 ul TE buffer
3. Spectrophotometric analysis using a quartz cuvette
4. Calculation of ug/ml DNA:
5. Absorbance at 260 nm x dilution factor (200) x 50 ug/ml + ug/ml in DNA

Figure 4



- In Step 1 the DNA strands are denatured by heat at 95° C.
- In Step 2 the primers anneal to the target region when cooled to 60° C.
- In Step 3 the temperature is raised to 72° C and the primers are extended by the DNA polymerase enzyme in the presence of the four dNTPs.

The 3 steps completes 1 cycle of PCR; 35 cycles completes Program #27.

Sexing PCR—Step 5

PCR is a technique used to amplify a specific segment of a gene and that segment is defined by known sequences on either side, in this case the SMC region of the X and the Y chromosomes (see Fig. 3). The first of the three steps of a PCR cycle involves the heat denaturation to separate the double-stranded DNA. Single-stranded DNA primers that are complimentary to each of the known flanking sequences are used to hybridize (or anneal) to the correct known sequences. This annealing constitutes the second step of the PCR cycle and allows the defined region to be amplified. In the third step temperature cools to and allows extension (synthesis) of the primers by the Taq polymerase in the presence of the four dNTPs. Each PCR cycle doubles the number of the desired DNA segment and is continued until the segments are sufficiently numerous for visibility as gel bands after electrophoresis (see Fig. 4).

The PCR procedure used involves two controls: a template minus (T-) reaction was used as a negative control, and Lambda DNA served as a positive control. There are many potential sources of pre-PCR contamination including an individual's hair or skin cells, laboratory surfaces, equipment used, airborne contamination, and PCR components. If contamination was present, a reaction would occur resulting in bands present in the (T-) lane on the gel. A clear lane on the gel with no bands present indicates a reaction did not occur and there is no contamination. Lambda DNA serves as a positive control indicating the success or failure of the PCR components added to the procedure. If bands were produced, conditions were favorable for PCR. If there were no bands produced, the conditions were not favorable for PCR to take place.

Materials:

Sample DNA

Distilled H_20

1X PCR buffer (10X stock)

1.5 mM MgCl2

200 uM dNTP (40 mM stock)

1 uM SMCX-1 (50 uM stock)
(primer for SMC gene
5'-CCGCTGCCAAATTCTTTGG-3')

1 uM SMC4-1 (SMCY-1) (100 uM stock)
(primer for SMC gene
5'-TGAAGCTTTTGGCTTTGAG-3')

1 uM LACP-1 (100 uM stock; lambda primer)

1 uM LACP-2 (100 uM stock; lambda primer)

2 units Taq Polymerase (5 units/ul stock)

Mineral oil

A master mix was prepared with all common ingredients with a volume sufficient for DNA samples: T1, Lambda, known male (#49), and female (#23) were used for band size comparison. Common ingredients included dH_20, PCR buffer, MgCl2, dNTPs and Taq polymerase. The master mix was divided into the PCR tubes and remaining ingredients were added to the appropriate tubes for 50 ul total volume in each. Adjustments were made with dH_20. The PCR samples were then covered with a layer of mineral oil. Program #27 was run on the Thermocycler.

The PCR thermal cycle is Program #27, 35 cycles, high stringency:

95° C, 30 seconds (denaturation)

60° C, 30 seconds (annealing)

72° C, 30 seconds (extension)

Gel Electrophoresis—Step 6

The gel ingredients were mixed and then poured into the gel apparatus and allowed to polymerize. 1.1 ul of 10X loading dye was mixed with each sample for visibility. 11.1 ul of each sample with dye was loaded and run at approximately 150 volts for three hours on a 7.5% polyacrylamide gel. Low molecular weight markers with loading dye were used on both sides of the gel for band size comparison.

Gel Ingredients:

29:1 Acrylamide/Bisacrylamide

10X TBE

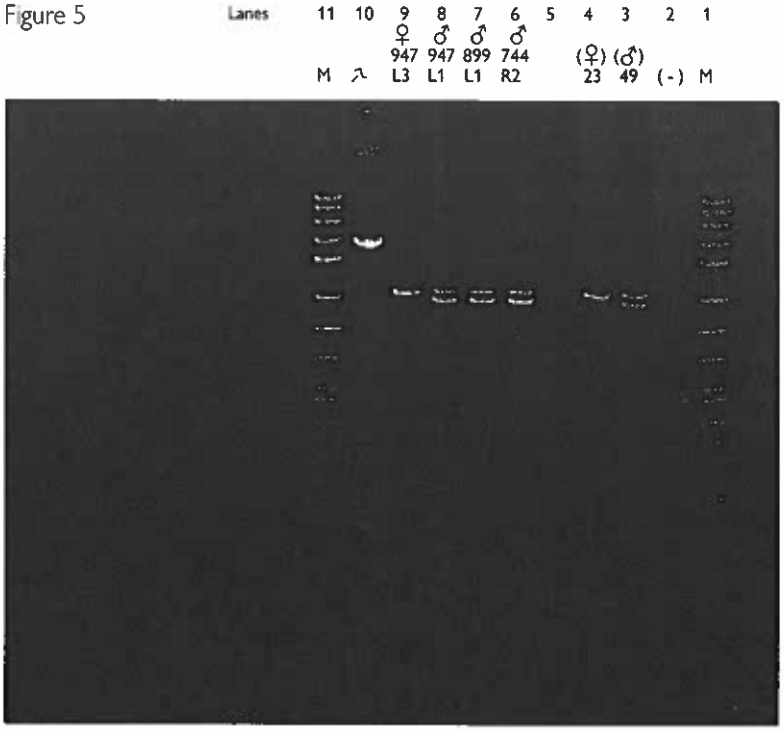
dH_20

10% APS

TEMED

After electrophoresis was completed, the gel was stained with ethidium bromide (EtBr) for 15-25 minutes and destained for the same amount of time in distilled H_20. Gel was visualized by UV light for amplification products and recorded on a gel documentation system (see Fig 5).

Figure 5



Lane 1: Marker
Lane 2: Template minus (-); control
Lane 3: Known male #49; control
Lane 4: Known female #23; control
Lane 5: Blank
Lane 6: Litter 744, fetus R2; 2 bands, male
Lane 7: Litter 899, fetus L1; 2 bands, male
Lane 8: Litter 947, fetus L1; 2 bands, male
Lane 9: Litter 947, fetus L3; 1 band, female
Lane 10: Lambda DNA; control
Lane 11: Marker

Results

Total samples analyzed (31):

(19) T0 (control) fetuses

(12) T3 (test) fetuses

Mothers	Litters	Sex
930 (T3):	930L1	F
	930R1	F
	930R2	F
	930R3	F
	930R4	F
927 (T3):	927L1	M
	927R1	F
	927R2	F
	927R3	M
806 (T0):	806L2	M
929 (T0):	929L1	F
	929L2	F
	929R1	M
	929R2	F
	929R3	M
	929R4	F
	929R5	M
910 (T0):	910L1	F
	910R1	F
744 (T3):	744R1	F
	744R2	M
889 (T3):	889L1	M
947 (T0):	947L1	M
	947L3	F
	947L4	F
	947R1	M
	947R2	F
	947R4	M
	947R5	F
	947R6	M

(See Fig. 5 for gel example.)

Discussion

After troubleshooting initial problems with the PCR protocol and ingredients, the sexing procedure went well and has been successful to date. The litters obtained thus far have been T0 (control) and T3 test groups. T1 and T2 test groups are not being pursued at this time until sufficient evidence exists between the two extreme concentrations, T0 with normal Phe levels and T3 with extremely high Phe levels, to investigate in the intermediate Phe level test groups. The results of the PCR procedure and the electrophoresis clearly show the band difference between the male and the female. As indicted by the gel (ref. example Fig. 4), two bands are seen for the male and one band for the female. Data have been collected from a total of 31 samples to date: 19 from the T0 control mothers and 12 from the T3 test mothers. The breeding of the PKU mouse line BTBR-Pah-Enu2 for this study has resumed and the dose-response analysis will continue over the next few months. Data obtained at this time are not sufficient for evaluation or discussion of the nutritional study of MPKU. Additional data are required for a high level of statistical significance to be obtained by this study. This level of analysis is necessary before the null hypothesis can be accepted or rejected.

References

Cho, Sangbun (1998). Sex determination of MPKU fetus. Unpublished manuscript.

Fisch, R.O., Tagatz, G., & Stassart, J.F. (1993). Gestational carrier: A reproductive haven for offspring of mothers with phenylketonuria: An alternative therapy for maternal phenylketonuria. *Journal of Inherited Metabolic Disorders 16(6)*, 957-961.

Koch, R., Levy, H.L., Hanley, W., Matalon, R., Rouse, B., Azen, C., & de la Cruz, F. (1996). Outcome implications of the international maternal phenylketonuria collaborative study (MPKUCS). *European Journal of Pediatrics*. 15S162-S164.

Koch, R., Levy, H.L., Matalon, R., Rouse, B., Hanley, W.B., Trefz, F., Azen, C., Friedman, E.G., de la Cruz, F., Guttler, F., & Acosta, P.B. (1994). The international collaborative study of maternal phenylketonuria. *Acta Paediatric*, 111-119.

Levy, H.L., & Ghavami, M. (1996). Maternal phenylketonuria: A metabolic teratogen. *Teratology 53(3)*, 176-184.

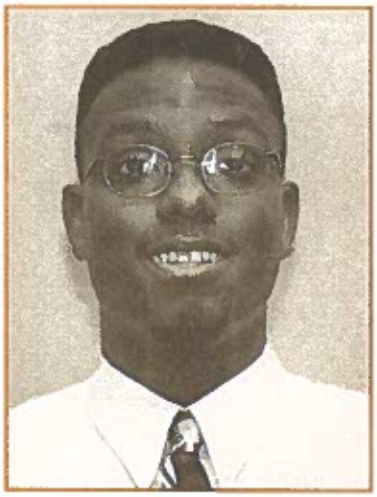
Lidsky, A.S., Law, M.L., Morse, H.G., Kao, F.T., Rabin, M., Ruddle, F.H., & Woo, S.L. (1985). Regional mapping of the PAH gene and the phenylalanine locus in the human genome. *Proc. Natl. Acad. Sci. USA 82(18)*, 6221-6225.

McDonald, J.D. (1994). The PKU mouse project: Its history, potential, and implications. *Acta Paediatric*, 122-123.

McDonald, J.D., Dyer, C.A., Gailes, L., & Kirby, M.L. (1997). Cardiovascular defects among the progeny of mouse phenylketonuria females. *Pediatric Research 42(1)*, 103-107.

Schraeder, J.R., (1993). Maternal phenylketonuria: A case study. In R.M. Lawrence (Ed). *Metabolic disorders: Treatment and case studies* (p. 411). Rochester, N.Y.: Barry.

Shedlovsky, A., McDonald, J.D., Symula, D., & Dove, W.F. (1993). Mouse models of human phenylketonuria. *Genetics 134(4)*, 1205-1210.



Marcus R. Fisher
WSU McNair Scholar

Utilizing Psychophysical Methods to Reduce Pain Perception: A Review of Literature

Marcus R. Fisher
WSU McNair Scholar
Linda Black, Instructor, Public Health Sciences
WSU Faculty Research Scholar

Abstract

This paper is a literature review of psychological and physical methods that affect pain perception and management. Pain is usually thought of as a sensation arising from nociception (the perception of pain resulting from noxious stimuli). Suffering and anxiety are correlates of pain that can be observed through pain behaviors. Relaxation, imagery, or behavior therapy works well on people with chronic pain, but management programs are also available for short lasting or acute pain. Physical and psychological therapies increase an individual's sense of pain control without dependence on drugs or mechanical devices. If the patient can control their pain, the therapist's job becomes that much easier, and the patient's recovery improves because he or she can concentrate on immediate tasks. This may lessen the vicious cycle of deconditioning and atrophy due to the avoidance of painful activities. This paper seeks to integrate scientific and clinical research on pain management.

This paper is a literature review of psychophysical factors affecting an individual's perceptions of pain. The psychological factors include imagery, listening tapes, social modeling, behavior therapy, self-efficacy, and applied relaxation training. The physical methods include

clinical touch, relaxation, acupuncture, massage and mobilization, and operant activities training. All of these methods have been proven to increase pain threshold without use of expensive modalities and medicines like electrical stimulation, whirlpool, iontophoresis, Lidocaine, Novocaine, Demerol, or morphine.

Pain Epidemiology

Although pain varies from person to person, there are three forms of pain common to everyone: acute, subacute, and chronic. These three are on a continuum. This paper discusses acute and chronic pain. Acute pain is a biological disorder that appears concurrently with tissue damage or stress and disappears when that stress is alleviated or when healing of the tissue takes place. It usually lasts from onset to two to three days. Acute pain is usually managed by one discipline. Chronic pain, on the other hand, persists after healing has taken place. It lasts an average of three or more months. Chronic pain demands a multi-discipline approach.

A physiological event that varies with pain can be considered a correlate of pain. For example, it is known that there is a rise in local endorphins when a person experiences pain. A correlate serves several purposes. Most importantly, a correlate could help confirm the validity of the experiment by linking verbalization of pain to the stimulus. The use of pain measurement tools links correlates of pain. It could also help quantify aspects of human pain such as anxiety that are ignored in most studies. Suffering, another correlate of pain, is the affective response that can only be observed through pain behaviors. These behaviors can exacerbate or diminish the suffering experience. The main problem with quantifying pain is patient response bias. Psycho-physicists assume that volunteers can accurately judge and report the intensity and quality of sensation elicited by laboratory stimulation. This may not be true, however, science continuously strives to improve methods of measuring pain.

Pain Measurement Tools

Measuring pain may be difficult because of other variables that influence pain by enhancing or inhibiting it, so learning how to decrease pain depends on knowing how to measure it. Psychological tests as well as physical measurements are available. Psychological tests include the Minnesota Multiphasic Personality Inventory scale (MMPI) and Basic Personality Inventory (BPI) and physical tests include a pain rating scale, the McGill Pain Questionnaire and the Multi-Dimensional Inventory (MDI) (O'Sullivan & Schmitz, 1994).

One of several methods of measuring the psychological effects of pain is the Minnesota Multiphasic Personality Inventory Scale. The MMPI is used for psychological variability and to provide information regarding anxiety, depression, hypochondriasis, and somatic preoccupation. The scale also considers mood and personal or emotional adjustments.

The Multi-Dimensional Inventory provides helpful information describing the patient's feeling of perceived solicitous or punishing behaviors by others and how others treat them, and their own levels of distress or lack of control. It can be used with acute pain to determine if their response to pain would require a multi-discipline approach. A psychiatrist, social worker, or the like may be called in immediately if the patient is untrusting in the therapist. (See Appendix A).

In the clinic, patients come in every day with varying levels of pain. It is up to health care professionals to quantify the patient's pain in order to treat them and determine the effects of pain-reducing therapies. The pain ratings scale is a subjective means of determining pain intensity. Patients describe their pain level on a scale of 1-10 with 10 being the worst pain imaginable and 1 being no pain. Visual analogue scales are also useful tools to assess pain intensity. (See Appendix B).

Another method for determining a patient's pain level is by having them fill out a McGill Pain Questionnaire. This form includes categories that help a patient describe their pain in sensory, affective, and evaluative means. This questionnaire includes very descriptive words that help a patient explain their complex pain. (See Appendix C).

Pain Response

Individuals demonstrate several different responses to pain. Muscle tension is the body's natural protective response to pain, and it is a good thing because it readies us for the fight or flight response. Muscle tension is good unless it is sustained. Sustained muscle tension can become cramps and spasms which are very painful. Anxiety can increase as the current or anticipated pain becomes the only thing the person in pain can think about; it can result in an increase in the intensity of the perceived pain. A combination of anxiety and

muscle tension can become a fear of future spasms. This fear of pain can lead to the cycle of pain which consists of injury -> muscle spasm -> muscle guarding -> muscle weakness -> muscle dysfunction -> injury -> and so forth. One must break the cycle before he/she reaches muscle dysfunction.

Deconditioning and atrophy can result from avoidance of activities that are perceived to produce pain. If, for example, a person has been lying in bed for three days after a total knee replacement, the patient fears walking because they believe it will hurt too much. If the patient tries to walk on the fourth day without prior weight-bearing activities, they will most likely suffer pain once the leg is in a dependent position. And if you get them to take a few steps to the bathroom, the pain will increase and all of their worse nightmares come true. This increased pain with physical activity can reinforce the belief that activity is damaging to their body because "anything that hurts this bad can't be good." They may establish a cycle of avoiding this behavior.

Emotional arousal and higher level central nervous system processes contribute powerfully to the experience of and to the suffering associated with pain (Chapman et al., 1995). In clinical experiences, physical therapists (PTs) and physical therapist assistants (PTAs) have seen people with torn anterior cruciate ligaments laugh while having their knees stretched. This is an obviously painful procedure, so why does the person laugh? This question was posed to them and they responded, " I don't know why I laugh. It hurts!" This was their way of dealing with pain instead of cursing or holding their breath.

Current Assumptions of Pain

One of the current theories on pain inhibition is the gate control theory which proposes that neural mechanisms in the dorsal horns of the spinal cord act like a gate that can increase or decrease the flow of nerve impulses from the peripheral fibers to the spinal cord cells that project to the brain (O'Sullivan & Schmitz, 1994). The somatic input is therefore regulated by the gate prior to pain perception and response. It is suggested that large-fiber (non-noxious, A-fiber nociception) and influenced inputs close the gate while small-fibers (C-fiber) open the gate. Descending controls from the brain (such as past experiences) also influence what is experienced.

Another pain inhibition theory involves the endorphin and opiate receptors. It was found that analgesia produced by brain stimulation and that produced by opioids share common receptor sites and modes of action (O'Sullivan & Schmitz, 1994). A naturally occurring opium receptor, morphine, was found to be abundant in central areas of pain control. It was also found that patients with chronic pain have lower levels of endorphins in their cerebrospinal fluid than healthy individuals and this depletion of endorphins is positively correlated with pain intolerance.

In a study done by Chibnall, Tait, and Ross (1997), medical students were given hypothetical "chart" patients with different medical findings, histories, and subjective pain levels. They were asked to rate the pain of the patient. Without medical evidence of pain, the students discounted pain levels of patients who rated their pain high to very high on a 0-10 scale. Patients with low to moderate pain were given accurate or augmented (increased) pain grades by the students. Patients with medical evidence of conditions that should be painful were given higher pain grades than those who didn't have that evidence in their chart. Patients reported a range of perceived pain of 3-9 on a 1-10 scale while the medical students reported and described pain levels of 3.3-7.3 on that same scale. This study also shows how health care workers sometimes think pain is fraudulent without medical evidence to support it.

Medicines and Modalities

Fluidotherapy, ultrasound (US), electrical stimulation (ES), transcutaneous electrical nerve stimulation (TENS), cold packs, whirlpool, vapocoolant spray, Lidocaine, Methadone, hydrocortisone, Raflin, Novocain, Demerol, and NSAIDS are the common medicines given to mask pain or reduce it. Nothing is wrong with using modalities to decrease pain as long as it is used with therapeutic exercise or some other intervention to extend their "palliative" effects. Otherwise, patients won't comply with their home exercise program (HEP) because they feel all they need is that quick shot remedy of technology. These patients won't be able to manage their pain on their own. Medicines are very useful in acute stages of pain, but the patient runs the risk of dependence or overdose. Medicines may control the pain, but unless something is done in conjunction with medicine, it is only prolonging the inevitable; and once the patient stops taking the medication, they still may feel the pain they've been missing all the time.

Psychological Treatment

In a study conducted by Godbey, Wolfe, George, Robertson, and Goldskin (1997), 130 colorectal surgery patients age 18-75 were asked to rate their anxiety levels twice daily beginning three days prior to surgery. On an anxiety scale of 0-100, all who participated clustered around 80 prior to the distribution of tapes that consisted of music only that was used to psychologically prepare them. By surgery time, tape listeners had an average drop of 40 points in anxiety levels while the non-listeners stressed up to 85 points. They listened to tapes during surgery and six days post-op. Upon release from the hospital, they were virtually anxiety free, while the others continued to average 50 points. The tapes used guided imagery to help patients relax, focus, and feel secure. Researchers believe the serene concentration invokes endorphin release.

Symbaluk, Heth, Cameron, and Pierce (1997) discovered that social modeling affected pain endurance, pain threshold, intensity, physiological strain, and self-efficacy. Employees with minor aches and pains may be influenced by pain-related behavior of co-workers (social models). If they observe co-workers tolerating similar pains while working, they will do the same. For treatment, one should either work alone with the patient or have a pain-tolerant audience.

Self-efficacy, as defined by Symbaluk and associates (1997), refers to individuals' beliefs in their ability to perform and cope with a task. People with high efficacy are able to deal with painful tasks longer than those with lower efficacy. Relaxation, attention, diversion, and self-instruction all enhance self-efficacy ratings.

Applied Relaxation Training

The Applied Relaxation Training method (Linton, 1994) used by physical therapists and other health care workers is a cognitive behavioral intervention to decrease stress and pain. Patients are taught to rapidly relax or cope with their pain. There are seven steps/activities in the applied relaxation training : (1) Information, (2) Relaxation (long), (3) Relaxation (short) and conditioned relaxation, (4) Conditioned relaxation and differential relaxation, (5) Rapid relaxation and differential relaxation, (6) Application One (office, easy), and (7) Application Two (everyday situations).

Step 1: Therapist provides a description of the applied relaxation training. It is a progressive relaxation, involving breathing, focusing, and the ability to relax specific muscles.

Step 2: Patient practices relaxing for long periods twice daily in the clinic and at home, too. Patient may use guided imagery, tapes, or breathing techniques to relax.

Step 3: Patient practices short and conditioned relaxation twice daily and then progresses to deep relaxation. Patient is still practicing in a familiar setting.

Step 4: Patient begins to venture out of their comfort zone to practice relaxation. Patient practices in different places and while doing everyday activities like shopping at the mall, attending a sporting event, working, or visiting a friend. The patient also needs to be able to relax in different positions because if they are a receptionist at a law firm they can't very well lie down on the job to relieve their low back pain.

Step 5: Patient begins to learn how to relax rapidly in about 10-15 seconds, two or three times a day.

Step 6: Patient begins to practice step 5 once daily in a familiar place like work or home. Patient should be able to identify his/her symptoms that precede their pain in order to cause or prevent the pain. Patient should then practice rapidly relaxing in painful situations by invoking their own pain causing them and then learning how to control the pain.

Step 7: Patient begins to practice and complete step 6 in different locations and during everyday activities as they did in step 4.

Physical Treatment Techniques

Mobilization techniques have probably been used since prehistoric times. Soft tissue mobilization includes massage, deep transverse friction massage, myofascial stretching, and neural mobilization. Joint mobilization is used for hypomobile or painful joints to restore normal motion by means of spinning, sliding, rolling, compressing, or distracting adjacent joints in their physiological ranges. Rather than providing a detailed account of joint or soft tissue mobilization, this paper describes the physiological reasoning behind their success.

Three types of joint mobilization are oscillatory, sustained, and manipulative. They each have grades of movement through passive mobilization. Oscillatory has 4 graded oscillations. Grades 1 and 2 begin with small amplitude oscillations performed at the beginning of range of motion

(ROM) and progress to larger oscillations performed into the mid-range of a joint. Both are used to relieve pain through neurophysiological pathways in the subacute stage of joint inflammation or sprains. Grades 1 and 2 oscillations activate type I and II joint mechanoreceptors that are used to reduce pain. Passive mobilization thus results in decreased pain and decreased muscle tone. Grades 3 and 4 oscillatory movements, sustained movements and manipulative movements, are all mainly for restrictive/limited ROM and not pain reduction.

Clinical Touching

According to Fishman, Turkheimer, and DeGood (1995), physical contact of humans significantly decreases heart rate, systolic and diastolic blood pressure, and subjective pain ratings when that contact is in a socially acceptable form. However, these touches produce clinically insignificant effects that may change over a period of time—perhaps a month. Touch response may also depend on the quality of the relationship between the person being touched and the "toucher."

Acupuncture

John B. Murray proved that acupuncture produces clinically significant short-term analgesia (1995). Acupuncture has a delayed onset that slowly increases while raising the pain threshold, and its effects continue after the removal of the needles. Even during sham acupuncture or traditional acupuncture there was significant reduction in tension type headaches. With sham acupuncture, needles are placed near the trigger points superficially, as opposed to placing them in the trigger points more deeply.

Another kind of acupuncture is electro acupuncture (EA) used by dentists and PTs alike. A surface electrode is placed in the area where needles normally would be. Thirty students took part in a study conducted by Anderson, Ericson, Holmgren, and Linquist (1973) where twelve students used EA and eighteen used traditional acupuncture. The pain threshold was elevated in all subjects, but EA produced a slightly higher rise in pain threshold (Murray, 1995).

Frost, Hsu, and Sadowsky (1976) provided evidence that repeated use of acupuncture for treatment of chronic headaches was less effective than the first treatment. It is believed acupuncture works through the release of endorphins and endogenous opiates. It takes approximately twenty minutes to perform this treatment. Acupuncture effects wear off gradually, but it is cheaper and less additive than drugs and has no side effects (Murray, 1995).

Operant Activities

Operant activities training programs (Linton, 1994) provide positive (+) reinforcement rewards for good actions or mobility training and avoidance or negative (-) rewards for things people shouldn't do. An overview includes six steps or activities: (1) Information, (2) Select target activities, (3) Measure baseline, (4) Set goal/quota, (5) Check progress, and (6) Recycle.

Step 1: The patient provides background information by taking notes at home and noting pain levels and the amount of activity they engage in daily. The therapist must do an extensive evaluation along with the physician to rule out any other medical condition that would preclude activity training.

Step 2: The PT should start the patient off slowly with one to three activities that they like and are relevant to the patient. If the patient has back pain but likes walking, place them on the treadmill and correct deviations for part or their training.

Step 3: The PT determines the level of performance without provoking pain or fatigue. The work or activity should be measured with objectionable data like time units of production. The PT monitors the patient performing the activity in their normal manner and plots the results on a graph for future comparison.

Step 4: Once the baseline is determined, the PTA should provide small increases in repetition, resistance, duration, and so forth. Remember, patients may do more than, but not less than, the quota. Note: start with small increases rather than large ones to avoid patient failure.

Step 5: Reinforce success! Check the graphs and show the results of hard work to the patient. Celebrate! Give permission for the patient to celebrate in their own way, maybe a festive meal or just plain relaxing. In the unfortunate instance of failure, reevaluate the quota and lower the baseline to just below the failed point.

Step 6: Adjust the program to fit the patient's needs. Remember that motivation equals happiness and success. If the patient is not compliant or is not getting better, you may want to discontinue the program. The duration of the program is determined by patient progress.

Conclusion

A benefit of physical and psychological therapies is an increase in the individual's sense of control over pain without possible dependence on drugs or mechanical devices. If the patient can control his/her pain, it would make the therapist's job much easier. Additionally, it could improve the prognosis for recovery for the patient due to the fact that he/she can concentrate more on the rehabilitative tasks at hand. This can help stop the vicious cycle involving deconditioning and atrophy due to avoidance of activities perceived to cause pain. Continued progress in pain measurement and control will require integration of clinical and scientific research efforts.

Appendix A

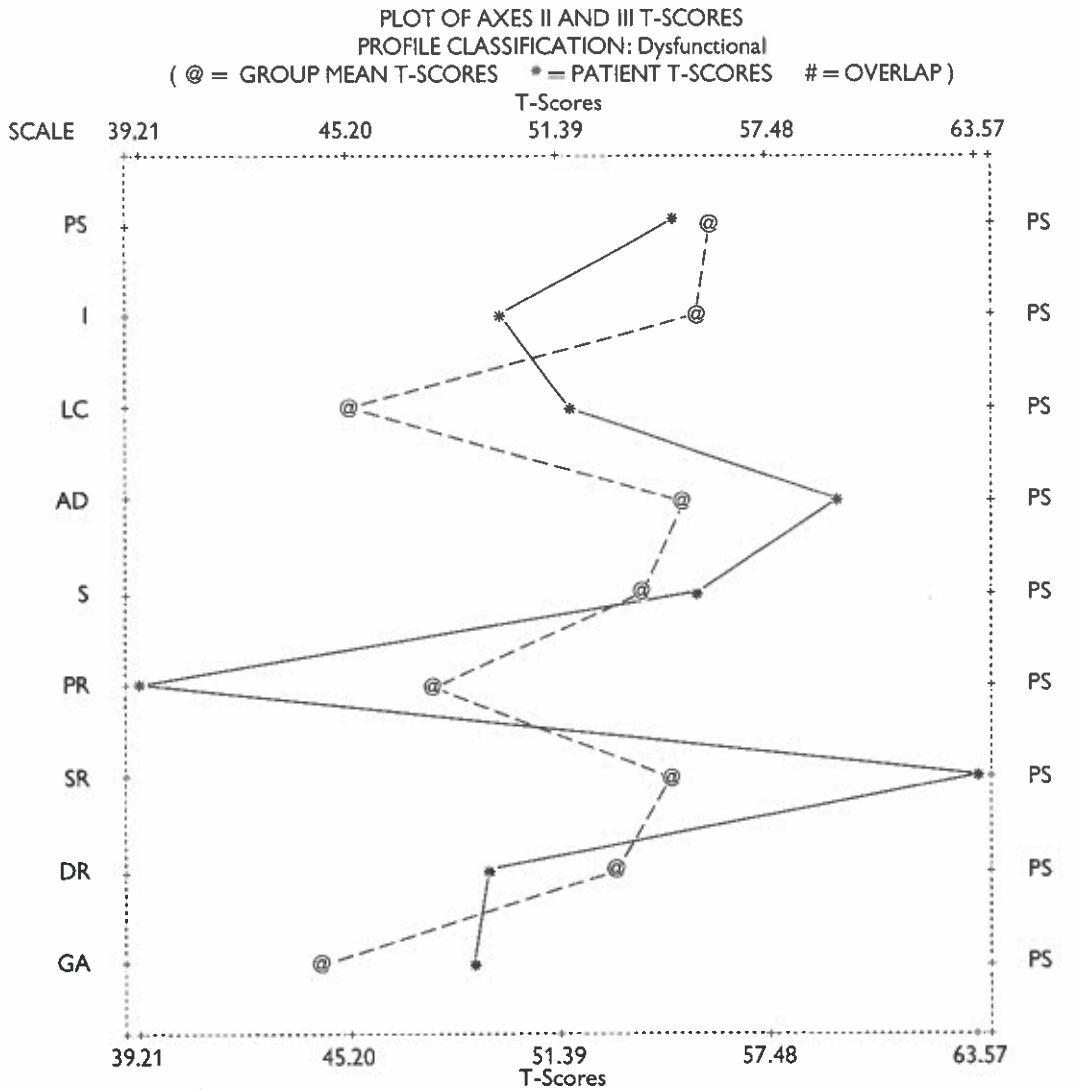


Figure Legend:

PS = Pain Severity
I = Interference
LC = Life Control
AD = Affective Distress
S = Support
PR = Punishing Responses
SR = Solictious Responses
DR = Distracting Responses
GA = General Activity Level (Mean of Activity Scales)

A sample of the Multidiciplinary Pain Inventory

(O'Sullivan & Schmitz, 1994)

Appendix B

Pain Evaluation and Rehabilitation Center

Please mark an "X" along the line to show hour your pain has affected your level of function.

1. At what level do you perceive your pain?

   No pain ——————————— Worst possible

2. At what level do you experience pain at night?

   No pain ——————————— Worst possible

3. Has the pain effected your level of activity?

   No pain ——————————— Total change

4. How well does medication relieve your pain?

   Complete relief ——————————— No relief

5. How stiff is your back/neck?

   No stiffness ——————————— Totally stiff

6. Does your pain interfere with sitting?

   No problem ——————————— Cannot sit

7. Is it painful for you to walk?

   No pain ——————————— Cannot walk

8. Does your pain keep you from standing/sitting?

   No problem ——————————— Cannot do it

9. Does your pain interfere with your normal household chores?

   No problem ——————————— Cannot do them

10. Does your pain effect your driving time in a car?

    No problem ——————————— Cannot do it

11. Do you get relief from your pain by lying down?

    Complete relief ——————————— No relief at all

12. How much have you had to change your job responsibilities?

    No change ——————————— So much I can't work

13. How much control do you feel you have over the pain?

    Total control ——————————— No control

14. How much control have you lost over other areas of your life due to the pain?

    No control lost ——————————— Total loss of control

Name: _____ Date: _____

(O'Sullivan & Schmitz, 1994)

Appendix C

McGill Pain Questionnaire

What does your pain feel like?

Some of the words below describe your present pain. Circle ONLY those words that best describe it. Leave out any category that is not suitable. Use only a single word in each appropriate category—the one that applies the best.

Sensory: 1-8 Evaluative: 16
Affective: 9-15 Miscellaneous: 17-20

1	2	3	4
Flickering	Jumping	Pricking	Sharp
Quivering	Flashing	Boring	Cutting
Pulsing	Shooting	Drilling	Lacerating
Throbbing		Stabbing	
Beating		Lancinating	
Pounding			
5	6	7	8
Pinching	Tugging	Hot	Tingling
Pressing	Pulling	Burning	Itchy
Gnawing	Wrenching	Scalding	Smarting
Cramping		Searing	Stinging
Crushing			
6	10	11	12
Dull Sore	Tender	Tiring	Sickening
Hurting	Taut	Exhausting	Suffocating
Aching	Rasping		
Heavy	Splitting		
13	14	15	16
Fearful	Punishing	Wretched	Annoying
Frightful	Gruelling	Blinding	Troublesome
Terrifying	Cruel		Miserable
	Vicious		Intense
	Killing		Unbearable
17	18	19	20
Spreading	Tight	Cool	Nagging
Radiating	Numb	Cold	Nauseating
Penetrating	Drawing	Freezing	Agonizing
Piercing	Squeezing		Dreadful
	Tearing		Torturing

(O'Sullivan & Schmitz, 1994)

References

Chapman, C.R., Casey, K.L., Dubner, R., Foley, K.M., Gracely, R.H., & Reading, A.E. (1985). Pain measurement: An overview. *Pain, 22,* 1-31.

Chibnall J.T., Tait, R.C., & Ross, L.R. (1997). The effects of medical evidence and pain intensity on medical student judgments of chronic pain patients. *Journal of Behavioral Medicine, 20,* 257-271.

Fishman, E., Turkheimer, E., & DeGood, D.E. (1995). Touch relieves stress and pain. *Journal of Behavioral Medicine, 18,* 69-79.

Godbey, S.F., Wolfe, Y.L., George, S., Robertson, S., & Goldstein, L. (1997). Sensory healing: Tapes may curb surgery stress and pain. *Prevention, 49,* 24-26.

Linton, S.J. (1994). Chronic back pain: Activities training and physical therapy. *Behavioral Medicine, 20,* 105-112.

Murray, J.B. (1995). Evidence for acupuncture's analgesic effectiveness and proposals for the physiological mechanisms involved. *The Journal of Psychology: Interdisciplinary and Applied, 129,* 443-61.

Neumann, W., Kugler, J., Seelbach, H., & Kruskemper, G.M. (1997). Effects of nondirective suggestions on pain tolerance, pain threshold, and pain intensity perception. *Perceptual and Motor Skills, 84,* 963-966.

O'Sullivan, S.B., & Schmitz, T.J. (1994). *Physical rehabilitation: Assessment and treatment.* (3rd ed.). Philadelphia: F.A. Davis Co.

Symbaluk, D.G., Heth, C.D., Cameron, J., & Pierce, W.D. (1997, March). Social modeling, monetary incentives, and pain endurance: The role of self-efficacy and pain perception. *Personality and Social Psychology Bulletin, 23,* 258-260.

Kim M. Matthews
WSU McNair Scholar

Funerary Practices Among Middle Eastern Muslims

Kim M. Matthews
WSU McNair Scholar
Arthur H. Rohn, PhD, Professor of Anthropology
WSU Faculty Research Scholar

Introduction

The purpose of this project is to research funerary practices of Middle Eastern Turkish Muslims in order to help identify characteristics that can be used to designate a cemetery as Muslim. Several approaches have been used in gathering data for this project. These included internet research, library research, and information from professionals working in the field. After reviewing all the sources of information, specific characteristics were identified that can be used to determine a cemetery as Muslim. These characteristics will be used for comparison with the third cemetery at Ancient Corinth, Greece, to help determine the religious beliefs of the individuals buried there.

Before a discussion of the archaeological sites in question can begin, a proper understanding of the "ideal" Muslim burial must be made. Ideally, when a Muslim dies, preparation for the burial takes place as soon as possible. The corpse is washed with cool and salty water to retard rotting, then wrapped in a burial shroud. There are two types of burial shrouds.

A man's shroud consists of three parts. The first is the izar, which extends from the head to the feet and is more than a meter wide. The next part is the quamis. It is similar to a shirt but is twice the distance from the shoulders to the feet. The final

part of the man's shroud is the lifafa. This part is wider and longer than the corpse. The ends of the shroud are tied shut with a piece of cloth at the head and feet.

A woman's shroud consists of five parts. These include the three used for a man. The fourth part of the woman's shroud is the khimar. It is similar to a head-wrap but it hangs over the face instead of being tied. The final part of the woman's shroud is the breast cloth which extends from the shoulders to the knees (Ikhlas 1995b:4-5).

Preparation of the grave begins with finding a Muslim cemetery. The grave is to be dug as deep as the corpse is tall. The shape of the grave resembles the human form (Ikhlas 1995a:3). The shrouded corpse is placed directly on the earth at the bottom of the grave shaft on its right side and the face is to be turned towards Mecca. Most likely, the body would have to be tilted on the right side, or the legs would need to be slightly flexed to keep the body in this position. There was no description found regarding placement of the arms or legs. In order to keep the head in position, sun-dried bricks or rocks may be placed behind it. A ceiling of some type is placed on the grave to act as a coffin lid, and then it is covered with dirt. A stone may be used to mark the location of the grave. Islamic tradition states that no inscriptions are to be made at the site (Riad 1997:4-5).

Documentation on Muslim funerary practices may offer some explanation about differences that are found at the following archaeological sites. For instance, if a pregnant, non-Muslim woman dies, and if the father of the child was a Muslim, then the woman should be laid in the grave on her left side with her back towards Mecca so that the child would be facing Mecca. Anything that has been separated from the corpse (including nails, teeth, or hair), should also be placed in the grave (Anonymous 1997a:2). Two pieces of fresh, green twigs are placed in the grave with the body, but this is difficult to discern at an archaeological site (Anonymous 1997b:4).

Excavation reports for several Muslim cemeteries in the Middle East were reviewed. These reports provided insight to characteristics found at "real" Muslim cemeteries. These excavation reports were from the Joint Archaeological Expedition to Tell-El-Hesi and from the Combined Caesarea Expedition. Characteristics of the Muslim burials at these archaeological sites were pulled together for comparison so that specific characteristics could be identified.

Prior to discussion of the excavation reports on these Muslim cemeteries, it is necessary to distinguish definitions for the variety of skeletal positions found in the graves. According to Lawrence E. Toombs (1985:82-89), the legs are slightly flexed if the angle formed by the upper and lower legs at the knees is clearly obtuse, moderately flexed if the angle approximates 90 degrees, and extremely flexed if the angle is sharply acute. The arm position was described in several ways. First, flexed at the elbow means that the elbow is bent to bring the arm across the chest or abdomen. Therefore, an arm across the chest or abdomen represents variations on the same position. Toombs (1985:82) stated that hand in pelvis indicates attempts at the time of burial to cover the genitals, and when the arm is extended, the hand is on the femur. "Extension refers to the trunk and head being essentially straight without significant flexion of the vertebral column. When referring to the arm or legs it means they are essentially straight" (Eakins 1992:21).

Tell-El-Hesi

The first archaeological site that was reviewed was Tell-El-Hesi. This site is located between Tel-Aviv and Haifa, Israel, not far from the coast of the Mediterranean Sea. Three cemeteries at this site were reviewed. These were excavated in several phases.

The first cemetery reviewed was located in Field I, Strata I-II, of the Tell-El-Hesi site. Approximately 400 burials were excavated at this location. Of these, 287 were preserved well enough to describe them in detail. They are believed to be the graves of Bedouin from the period of A.D. 1400 to 1800. Five forms of cists were used at this site. The descriptions for these come from Toombs' (1985:33-43) chapter on grave construction. The five forms are 1) simple earth burials; 2) cists of bare earth covered with flat stone slabs or field stones; 3) cists both lined and covered with stone; 4) cists lined with stone, but no covering; and 5) body enclosed in a pottery jar. Grave shape at this location corresponds to the shape of the human form. The most common skeletal positions here were extended on the back, extended on the right side, and flexed on the right side. The three arm positions that were prevalent at this site were 1) both arms extended; 2) right arm extended, left hand in pelvis; and 3) right arm extended, left arm across chest or abdomen. Skeletons that were extended on the right side usually had both legs straight. The left foot usually overlapped the right,

but at times they might lay side by side. Skeletons that were flexed on the right side had slight flexation of the legs. The usual case was for the left foot to overlap the right. Skeletons that were laid on their backs were usually extended. The legs were most often extended side by side with both feet resting on the ground. The skulls were in the west end of the graves. The majority of the skeletons had a gaze directed towards Mecca. Only a few of the graves included "stone pillows" that could be used to wedge the head in position. Some cloth fragments were found that could be from a shroud or the burial clothing. Toombs (1985:73) stated that the eye directions confirm that the community was Muslim, and the simplicity of the burials suggests that it was a Bedouin or peasant farming culture. Grave goods were minimal at this location.

The next cemetery to be discussed was located in Field V, Stratum II, of the Tell-El-Hesi site. There were 143 burials at this site. The grave shape at this site also took the shape of the human form. The depth of the grave usually corresponded with the height of the deceased. The types of cists employed at this location included those previously described by Toombs (1985:33-43). The common skeletal position at this location was extended on the back or extended on the right side. The position of the arms was usually to have the right arm extended and the left arm flexed. Most often the position of the legs was to have the right and left leg flexed. Most of the graves had the skull in the west or southwest end. The most common gaze of direction in Field V was south-southeast which is the direction of Mecca from Hesi. Several of the graves contained stone pillows. Eakins (1992:25) proposed that variations in the skeletal positions could be because the Bedouin of the Negev historically have been Muslims. He explains that living in the deserts as they did, their understanding of the Islamic faith was frequently minimal, and their practice of its tenets were often limited and distorted. Grave goods were scarce in this field.

Field VI and Field IX of Stratum II of the Tell-El-Hesi site were combined in their analysis. A total of 310 skeletons were found in this area. Grave shape at this location also corresponded to the human form. All five forms of cists previously described were used at this site. The majority of the skeletons were extended on their backs or extended on the right side (Eakins 1992). The majority of the skeletons had the right arm extended and the left arm flexed. At this site the right leg was usually flexed and the left usually extended. As in the previous cemetery, the skulls were in the west or southwest end of the graves which meant the gaze direction was usually south-southeast or southeast. Again, this is the direction toward Mecca. There were only two stone pillows found during the excavation at this site. No other grave goods were noted for this site.

Other Sites Near Tell-El-Hesi

Tel-Gat is located about 9 km northeast of Tell-El-Hesi and was dated to A.D. 600 to 1400. There were approximately 100 burials excavated at this location. There was no description of the grave shape at this site. The burials here included skeletons resting on the earth floor of stone-lined graves. The skeletons lay on their right sides with their legs slightly flexed. The skulls were usually in the west end of the graves and the faces turned south so that the gaze was directed toward Mecca. Grave goods at this site included bracelets, rings, earrings, beads, metal disks, and a group of small glass bottles.

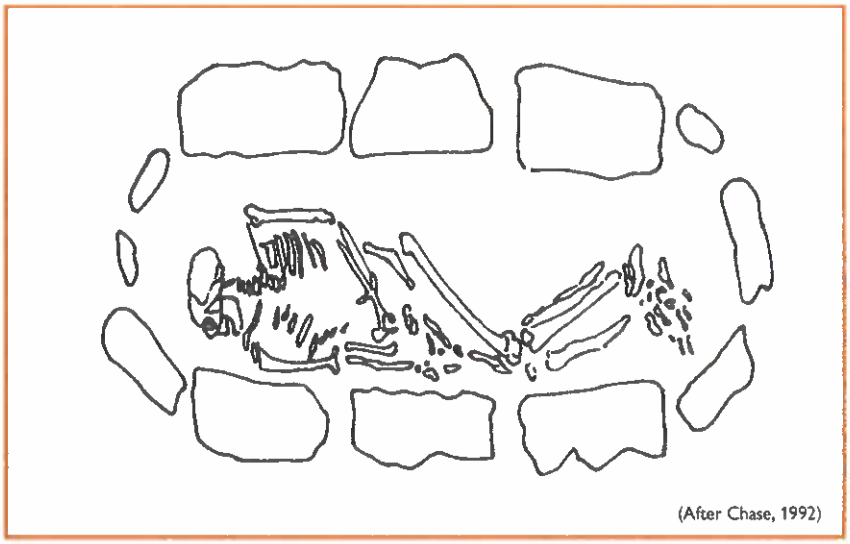
Tel-Zeror is 10 km from the Mediterranean east of Hadera and dates to the Middle Arab Period A.D. 1200 to 1400. There was no mention of grave shape at this location. Graves at this site included simple earth burials, stone-lined cists, and cists that were stone-lined and stone-covered. All the skeletons at this location lay on their right sides extended with the skull pointing to the east or west and the face turned south towards Mecca. There were almost no grave goods at this location except women's accessories of iron or bronze bracelets, rings with stone inset, and beads.

Tel Mevorakh is 11 km north of Tel-Zeror and is dated A.D. 1100 to 1800. There were 42 graves excavated at this site. The grave shape at this location was not provided. These included simple earth graves, those that were stone-lined and stone-covered, the single burial of an adult under a stone cairn, and burials of infants in pottery jars. The information on this location is that the graves were oriented East-West and the skeletons faced south towards Mecca. Grave goods included bracelets; earrings; pendants of bronze, iron, and glass; and beads of semi-precious stones and glass.

Caesarea Maritima Site

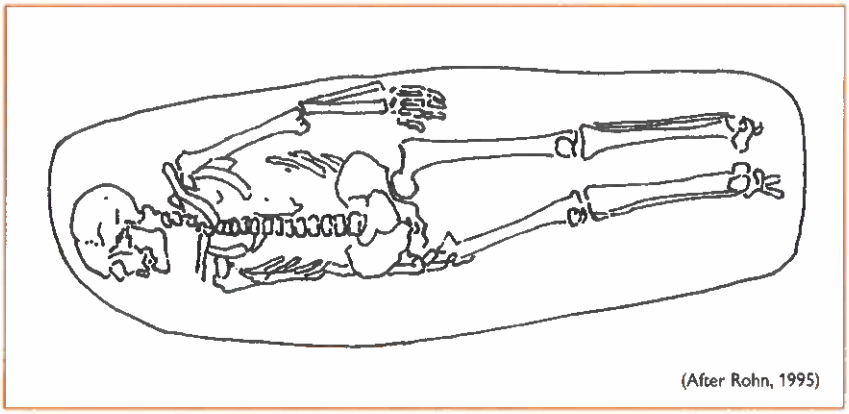
The last site reviewed was Caesarea Maritima, which is part of the Combined Caesarea Expedition. The site is located 5 km southwest of Tel Mevorakh (Toombs 1985:18). Dating is presumably from A.D. 1400 to 1800 for the post-Crusader Muslim burials. There were 19 burials that were excavated in area KK/3 (Chase 1992:1). These graves took the shape of the human form. The cist types here included

simple earth burials and cists that were stone-lined. The skeletons lay on their right side, extended or semi-flexed (See Illustration 1). The skulls were in the west end of the graves and turned south to face Mecca. Some of the skeletons had the left arm flexed across the torso, but the arm positions at this site varied. There was not much in terms of grave goods at this location. The minimal amount of jewelry was determined to be of a Bedouin type. It is assumed that these are Bedouin burials. In addition to Toombs (1985) and Joan W. Chase (1992), Dr. Kathryn L. Gleason of Cornell University and Dr. Kenneth G. Holum of the University of Maryland contributed to the information on the Caesarea site.



(After Chase, 1992)

Illustration 1



(After Rohn, 1995)

Illustration 2

Ancient Corinth Site

Information from the previously described archaeological sites will be used for comparison with the third cemetery at Ancient Corinth. The third cemetery at Ancient Corinth probably dates somewhere after A.D. 1312 and possibly into the 15th century. Information on the excavation at this site was provided by Dr. Arthur H. Rohn and Dr. Ethne Barnes, both of Wichita State University. The grave shape here was made to accommodate the human form. The cists at this site were simple earth burials. The skeletons in this cemetery were found laid on their backs in extended position with the arms extended at the sides (See Illustration 2). The skulls were in the west end of the graves and turned to face south, presumably towards Mecca. The skeletons may be oriented slightly to the WSW-ENE rather than truly east-west, which might allow the faces to more closely approximate the direction of Mecca, which actually lies southeast of Corinth. Grave goods at this site were scarce.

Professionals working in the field were an important part of this project. Whether it was a reference for the library or first-hand knowledge about the excavations, these professionals contributed to this project. Their guidance is appreciated. Dr. Arthur H. Rohn and Dr. Ethne Barnes, both of Wichita State University, Department of Anthropology; Professor Kenneth G. Holum, of the University of Maryland, Department of History; and Kathryn L. Gleason, of Cornell University, Landscape Architecture Program, are acknowledged for their assistance.

A combination of all the sources helped to form a list of characteristics for Muslim burials. The goal was to refine the previously used characteristics. Several different perspectives were used to accomplish this task. After gathering information from all the sources on archaeological excavations, they were reviewed site by site to identify what characteristics occurred at all the locations. The documentation on the "ideal" religious practices of Muslims involving death and burial were also reviewed.

Through combining this information, a broad range of characteristics can be seen in Muslim cemeteries.

Findings

Muslim graves usually mimic the shape of the human form. Grave construction can include any one or all of the following five forms of cists that have been described by Toombs (1985:33-43). These include 1) simple earth burials; 2) cists of bare earth covered with flat stone slabs or field stones; 3) cists both lined and covered with stone; 4) cists lined with stone, but no covering; and 5) body enclosed in a pottery jar (See Illustration 3). The simple earth burials and the cists of bare earth covered with flat stone slabs or field stones seem to be the preferred style of grave. This supports the Koranic injunction against elaborate tombs. The three skeletal positions that are most frequently encountered include: 1) on their backs, extended; 2) extended on the right side; and 3) slightly flexed on the right side. The most common leg position was to have the right leg flexed and the left leg extended. The most common arm position was to have the right arm extended and the left arm flexed. Variations in the position of the arm across the body include across the chest, abdomen, or pelvis. The tendency was for the left arm to be across the pelvis. The skull should be in the west end of the grave and turned to face south towards Mecca. Grave goods are minimal at Muslim burial sites.

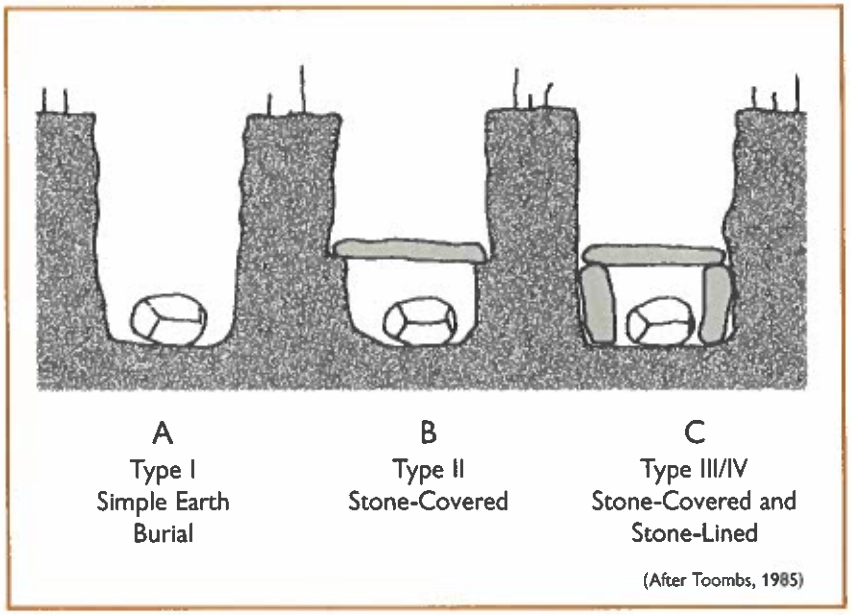


Illustration 3

Discussion

There is much variation among "real" Muslim cemeteries. Lawrence Toombs (1985:81) suggested that the decay of the flesh may have caused changes in arm positions. Other agents of change may have been the collapse of capstones on the skeletons, the action of rodents, or the excavation process. Toombs (1985:85) also offered the following explanation for the hand in the pelvis, "Among the Bedouin, as in many other cultures, the left hand is regarded as the inferior member and is used for base and menial tasks. For example, the cleansing of the body after defecation is done with the left hand. Consequently, gestures made with the left hand are hostile or derogatory, and the left hand is the natural choice for covering the genitals at the time of burial. Moreover, in burial on the right side the left arm is the upper or mobile limb and is more readily available for the purpose."

Although these characteristics may be dependable (generally) for determining if a cemetery is Muslim, other factors must be acknowledged when evaluating the third cemetery at Ancient Corinth. Further research revealed that although the Ottoman Empire was basically Muslim, people of other faiths, such as Christians, Jews, and Zoroastrians were tolerated. Others were converted to Islam. However, Sugar (1977:11) pointed out that the religions of the frontier of the Ottoman Empire with this Christian and Muslim mixture of superstitions, mysticism, traditional, and in some cases even pagan beliefs, were more similar to each other than they were to officially correct versions of the creeds. He further explains that these folk-religions began to fuse and gradually became dominated by Muslim characteristics. This offers a good explanation for the adaptation of the local peoples of Greece to Islam.

During the Ottoman Empire, it was required for the Sultan to be a Sunni Muslim. Splits within the Muslim community can be partially attributed to differences in the acceptance of certain Hadiths. Hadiths are meant to be a written account of Muslim traditions. Another factor that may influence the different practices of Muslims is location. Muslims in the empire came from many areas. The Ottoman dynasty lured

thousands of Turkoman nomads, Arabs, and Iranians who were fleeing from the Mongols into the Sultan's service to assist in booty raids into Christian territory.

This research project brought up more questions of importance. How pertinent is it that the skull be in the west end of the grave? What if the Muslim dies at a location where the skull must be in the east end of the grave in order for the face to be turned toward Mecca? Perhaps the location requires the corpse to be laid on its left side instead of the right. Since non-Muslim women can marry Muslim men, it makes sense that they could possibly be buried in the same cemetery. Since Muslim women cannot marry non-Muslim men, it is proposed that it would be highly unlikely to find a non-Muslim male in the cemetery.

Further study of the funerary practices of Middle Eastern Muslims is warranted. The sites that have been discussed show variation from the designated rules of burial according to Islam. It may be a Muslim cemetery, but what type of Muslim cemetery? Just as Christianity includes Catholics, Baptists, Southern Baptists, Presbyterians and the like, Islam comprises many denominations. Much depends on where one lives and how they learn the rules of the religion. Muslims in the empire came from many areas. These different locations may involve language differences. Often, information is altered when translated. This could reflect differences in the peoples' adherence to the doctrine of the religion. The next step in this study would appear to be distinguishing characteristics among the different denominations within the religion of Islam.

References

Anonymous (1997a). Rules About Burial of the Dead Body. URL: http://www.al-islam.org/laws/burial.htm#635. Visited site on 10/15/97.

Anonymous (1997b). Rules Regarding Kafan. URL: http://www.al-islam.org/laws/kafan.html. Visited site on 10/15/97.

Barnes, Ethne (1997). Personal communication.

Chase, Joan W. (1992). Mortuary analysis of the recent burials in area KK, preliminary report, 1990, *Journal of Roman Archaeology*, Supplement 5, 1992, pp. 176-180.

Eakins, J. Kenneth (1992). Tell-El-Hesi: The Muslim Cemetery in Fields V and VI/IX (Stratum II). *The Joint Archaeological Expedition to Tell-El-Hesi, Volume 5.*

Gleason, Kathryn L. (1997). Personal communication.

Holum, Kenneth G. (1997). Personal communication.

Ikhlas, Waqf (1995a). Carrying the Corpse and the Burial. URL: http://www.ihlasnet.com/Endless_Bliss_Fifth_Fascicle/Bliss-5-Chapter-16.htm. Visited site on 10/9/97.

Ikhlas, Waqf (1995b). The Religious Service to be Done to the Deceased—The Shroud. URL: http://www.ihlasnet.com/Endless_Bliss_Fifth_Fascicle/Bliss-5-Chapter-14.htm. Visited site on 10/9/97.

Riad, Sedki (1997). Dying and Death: Islamic View by Professor Sedki Riad. URL: http://www.vt.edu:1002/org/islam_sa/death.txt.

Rohn, Arthur H. (1997). Personal communication.

Sugar, Peter F. *A History of East Central Europe Volume 5: Southeastern Europe under Ottoman Rule 1354-1804.* Cambridge University Press.

Toombs, Lawrence E. (1985). Tell-El-Hesi: Military trenching and Muslim cemetery in Field 1, Strata I-II. *The Joint Archaeological Expedition to Tell-El-Hesi, Volume 2.*

Glenn Anderson II
WSU McNair Scholar

VALUE CANNOT BE SUBJECTIVE

Glenn Anderson II
WSU McNair Scholar
Robert Feleppa, PhD, Associate Professor of Philosophy
WSU Faculty Research Scholar

It is popular to assert that ethics, values, or morals within a society are relative to only that particular society and that they have no objectivity. The belief that these are only human social constructs and are useful if they have some greater value in society that their existence functions to maintain is also popular. However, the explanation by function of value, as well as the belief that values are relative, has very serious internal flaws that render these beliefs inconsistent within themselves and does great damage to social activism or moral progress.

Pertinent to this paper is the popular belief system, Ethical Cultural Relativism (ECR). ECR proposes that all values or morals in societies are relative and have their validation only in that particular society and does not allow for individuals to hold their belief system as predominant. For example, according to the theory of ECR, an elderly person cannot assess the present value structure against a belief system held in years past by that same society and determine that one value system is preferential to the other. In addition, one cannot hold his or her own belief system as preferential to another value system in another culture. In their studies, anthropologists have attempted to explain the differences among various cultures through their proposition of the Cultural Differences Argument (CDA). The Cultural Differences Argument postulates that because different societies have different moral codes there can be no objective moral code. Those who believe in ECR often sight CDA to support their conclusions. In demonstrating the flaws in both ECR and CDA, this research attempts to provide compelling evidence that these belief systems cannot be logically supported.

Ethical Cultural Relativism is flawed because it bases value on social acceptance and it makes everything society believes to be true as absolute truth. For example, if a society has adopted and accepted the practice of murdering those who are born with any mental or physical deformities, then infanticide becomes a moral practice for that society. ECR makes right and wrong into simple matters of social acceptance. Erroneous conclusions create flaws in the Cultural Differences Argument as well. Proponents of CDA conclude that because there are differences present in various cultures, morality and value must be footed in cultural belief systems and subjected to cultural acceptance. These conclusions lead to the premise that morality and value cannot be objective. In other words, right and wrong are only matters of opinion, and opinions vary from culture to culture.

If value is truly subjective to social acceptance, then moral reasoning merely becomes the reflections of the customs in a society. This belief system saddles the relativist with the reasoning that the abolishment of any social practices through social reform was not because the act was found to be morally impermissible, but rather because it ceased to serve the greater social program. For example, Congress passed the Civil Rights Act of 1964 because the maintenance of segregation began to run counter to social cohesion. If serving the functions of society is the reasoning behind such social change and not the result of moral awakening of a generation, then we do humankind a disservice and threaten social cohesion because if the circumstances were to reverse, segregation might be implemented again. Relativists are essentially proposing that all social progress is achieved by manipulation.

I believe that when one studies the theory of ECR or CDA fully, the theories become inadequate and inconsistent with the usual human conception of value and morality. The ramifications of a society that adheres to ECR are wholly intolerable for many individuals and the theory does not create harmony between the thought processes and the ethical actions that humans perform. The difference is so radical that I believe the theories of ECR and CDA cannot be rationally justified.

Pamela R. Bauer-Kane
WSU McNair Scholar

Creating Books with Children

Pamela R. Bauer-Kane
WSU McNair Scholar
Cheryl Hamilton, PhD, Assistant Professor of Art and Design
WSU Faculty Research Scholar

This research explores how the process of creating books (writing, illustrating, and assembling original books) benefits children by encouraging reading, stimulating visual-verbal learning, developing sequential abilities, and improving reading and writing skills. The literature reveals that the combination of visual and verbal skills stimulates diverse learners. Janet L. Olsen (1992) states in *Envisioning Writing,*

"Drawing and writing needs to be integrated in our schools. Visual and verbal modes of learning can indeed be woven together in the classroom. Language need not and should not be separated from its initial visual component—this way, all types of learners can benefit" (p. 6).

David Melton (1995) agrees that creating books benefits children. Melton indicates in *Written & Illustrated by. . .* that creating books gives children the opportunity to illustrate their written work and provides important and pleasurable tools to use in the learning process. Similarly, Paul Johnson (1993), an author in the forefront of this research, has found that creating books stimulates children, contributes to a sense of achievement, and provides a tangible object to treasure and value. Furthermore, he indicates that this activity helps students to better understand the writing process as they illustrate their words. The research suggests that creating books with children is a meaningful and enjoyable way to teach and to learn.

To investigate the process of creating books, this researcher created books with 20 fourth graders while observing their learning processes. Additionally, a questionnaire was distributed to 26 teachers to examine their evaluation of creating books with children. The students' and teachers' responses were nothing short of enthusiastic.

Methods

In the classroom, the visual-narrative approach (Olsen, 1992) was used with students to create their books. Twenty students wrote a story or idea, illustrated their idea, and then rewrote their story using only the illustration. Most of the students changed or enhanced their stories with the second writing. After they developed their final story, they created the story boards (12" x 18" paper folded into eight rectangles). The story boards displayed each page as it would appear in their books. Once the story boards were completed, the students created the pages for their books, created a cover, and assembled the pages using a style of book binding known as Japanese Stab Binding (LaPlantz, 1995).

To investigate teacher responses to creating books with children, a questionnaire was created and distributed to 26 teachers. The questionnaire investigated three things: (a) if the teachers created books with their students; (b) if the teachers agreed or disagreed whether creating books benefits children; and (c) if the teachers desired to start or continue creating books with children. Nineteen of the questionnaires were returned.

Results

The majority of the students seemed to enjoy creating the books, and many commented that writing was the most difficult activity, and assembling was the most fun. As the students were observed, this researcher noted different learning styles such as students with high verbal and low visual, students with high visual and low verbal, and a combination of both. For example, one student sat down and immediately wrote five pages suggesting that she may be a verbal rather than a visual learner. Three students had difficulty forming words on paper, yet once they started illustrating, they were able to create their stories. Seventeen of the 20 students completed their books, all but one wanted to create another book, and one commented that she wants to become an author.

Eighteen teachers reported that they had created books with their students. Seventeen had created books this semester. The majority of the teachers strongly agreed that creating books encourages reading, improves writing skills, and develops sequential abilities. Teachers also agreed that creating books helps students develop conclusions with supportive evidence, develop characters, and delineate setting and plot solutions or resolutions, and addresses the different learning styles. The teachers indicated that illustrating books helps students connect and organize their stories.

Discussion

It was exciting to read the literature about creating books and to observe teachers and students generating enthusiasm for the process. The literature and the teachers' and students' responses suggest that creating books can enhance children's learning in an enjoyable and meaningful way. This investigation of creating books with children is a beginning and not an ending: As an artist and art teacher, I will have many opportunities to add more knowledge and information to this fascinating research.

References

Johnson, P. (1993). *Literacy Through the Book Arts.* Portmouth, NH: Heinemann.

LaPlantz, S. (1995). *Cover to Cover, Creative Techniques for Making Beautiful Books, Journals, and Albums.* Asheville, NC: Larks Books.

Melton, D. (1985). *Written & Illustrated by . . .* Kansas City, MO: Landmark Editions, Inc.

Olsen, J.L., (1992). *Envisioning Writing, Toward an Integration of Drawing and Writing.* Portsmouth, NH: Heinemann Educational Books, Inc.

Melody Chase
WSU McNair Scholar

Examining Social Work Roles and Prevention in Schools for Children at Risk

Melody Chase
WSU McNair Scholar
Cathleen Lewandowski, PhD, Instructor, Social Work Program
WSU Faculty Research Scholar

A large number of teens and younger children continue to be at risk of experiencing various social problems such as dropping out of school; living in poverty; depending on government assistance; becoming involved with drugs, gangs, and crime; and producing children before they are ready for this responsibility. If these problems are not addressed and prevented, there will be many adverse effects on the economic, mental, social, and physical health of children, their families, and society at large.

To become responsible citizens, children at risk need to be educated to recognize the far-reaching implications of their decisions. If they were taught to better understand themselves, their ethical responsibilities, and the impact their decisions have on their lives and the lives of others, they could make wiser life choices at crucial stages in their lives. Effective prevention courses in the schools can help fulfill this need.

Social workers deal with problems that result from poor life decisions on a regular basis in their line of work. Since they are often the ones to help pick up the pieces, their perceptions are important. Experience has shown that an ounce of prevention is worth a pound of cure as the saying goes. Thus, members of this profession need to recognize that

prevention should be an integral part of social work practice.

This exploratory research assesses social workers' perceptions of preventive efforts being made on behalf of children at risk in our schools. It examines whether social workers, who have experience working with children in social agencies, perceive any connection between growing caseloads and the amount and/or quality of preventive efforts in the schools. In addition, it questions whether social workers in the schools are given enough time with children at risk to develop the rapport necessary to be effective. One of the professional roles social workers are educated to fulfill is that of educator, but this role often goes unfulfilled. This research questions whether there is sufficient opportunity for social workers to teach prevention in the school setting.

Methods

Since there was no known data collection instrument for this topic, it was necessary to devise one. This data collection instrument was designed as a self-administered survey. It contained a variety of questions including basic demographic questions and those utilizing a Likert scale ranging from strongly agree (5) to strongly disagree (1). At the end of the survey, there was space provided for any additional comments. Two faculty members at Wichita State University (a medium-size university in the mid-west) were consulted about how to construct the survey.

The design was exploratory in nature because problems have been identified, but our understanding of them is limited. It was also cross-sectional in order to control for threats to internal validity such as testing effects, maturation, history, instrumentation, and experimental mortality. To obtain data, the social agencies were contacted by phone to obtain permission to deliver surveys to their social workers. Then surveys were hand delivered to Boothe Youth Services, Comcare, DCCA, Family Consultation Services, Kansas Children's Service League, Salvation Army Foster Care, Social Rehabilitative Services (SRS), Roots and Wings, and Youthville. In all, 70 surveys were delivered. A total of 32 surveys were received from the social workers.

Results

Sixteen of the 32 respondents either agreed or strongly agreed that large caseloads in social service agencies reflect the lack of preventive education for children at risk; ten were unsure. Twenty-four of the 32 respondents either disagreed or strongly disagreed with the statement that there is enough emphasis on the prevention of social, mental, and emotional problems of children and teens in the schools to help children at risk make wise life choices; five were unsure. Twenty-two of the respondents agreed or strongly agreed that not having built-in time scheduled with children (like there is for academic subjects) makes it more difficult for social workers to develop rapport and teach preventive life skills; eight were unsure. The findings of this research indicate that the majority of respondents either agreed or strongly agreed that much of school social workers' time is spent working for special education students or on administrative tasks. The majority also agreed or strongly agreed that most social workers' jobs are designed to handle crises, not to prevent them.

Discussion

This research suggests that there is little opportunity for social workers to develop rapport or teach preventive life skills to most children at risk. Children want to know why they shouldn't engage in risky behavior and we should tell them. Our answers should be more substantive than merely to say because it's not right or because they aren't adults. This is especially true when they are at a stage when they want nothing more than to prove their adulthood, and if we say it's not right they naturally want to know *why* it is not right. Preventive education based upon sound research could give kids the answers they are so desperately needing.

Some children lack guidance from their parents, and others reject their parent's guidance in an attempt to find their own identity. Clearly then, children need another source of guidance or they may be unduly influenced by their peers. This research suggests that there is not enough emphasis on prevention in the schools. Prevention courses based on the economic, mental, social, and physical health of children, families, and society at large should be available to all children. This type of preventive education could provide an alternate source of reliable guidance.

Increasingly social workers face a growing number of clients in crisis at the same time as there is a decreasing amount of funding. Added attention to prevention in the schools could help get this difficult situation under control. Social workers are taught that becoming an educator is one of their professional roles. Yet they have been all but forced to abandon their roles in education and, by extension, prevention. This should be addressed by educating and gaining the support of legislators, professionals, and the public about the changes that need to be made in the schools.

The results of this research indicate that social workers do not have enough opportunity to fulfill their role of educator even though they are well suited to teach prevention. Social workers are ideally suited to teach prevention curricula because social work has a long history of drawing information from many professional disciplines. This matches well with Durlak's (1995) definition of prevention as "a multidisciplinary science that draws upon basic and applied research conducted in many fields" (p.2).

Social workers and other helping professionals should work together to contribute to a knowledge base for a national school prevention curriculum. This may limit the occurrence of school dropouts; poverty; government dependence; and involvement with drugs, gangs, crime, teen parenthood, and other serious problems. Educating adolescents about the possible implications of their choices and teaching them to become responsible citizens should not be left up to chance. In view of the problems facing children at risk, their families, and society at large, social workers (once known as "visiting teachers") should have time built into school schedules to develop the rapport and to teach the courses needed to help prevent social problems.

Valeria Higinio
WSU McNair Scholar

Knowledge About and Attitudes Toward AIDS: A College Sample

Valeria Higinio
WSU McNair Scholar
Ronald Matson, PhD, Associate Professor of Sociology
WSU Faculty Research Scholar

At the beginning of the AIDS epidemic, AIDS primarily infected homosexual men and intravenous drug users. Because of the marginalized groups associated with high-risk for infection, AIDS has become a stigmatized disease. For individuals infected with HIV, this stigma often leads to discrimination in housing, employment, and education. Additionally, individuals may encounter rejection from family and friends and difficulties obtaining willing and knowledgeable medical providers. This study assesses students' knowledge about HIV and their attitudes toward people with AIDS. In order to form educational programs that benefit everyone involved, determining various individual attitudes is necessary.

Methods

Students from a mid-western public university participated in this study which assessed their knowledge and attitudes about AIDS. In regularly scheduled sociology classes, students were asked to voluntarily participate in a questionnaire which took approximately ten minutes to complete. One hundred fifty-eight female and 95 male students participated in the survey. Their ages ranged from 17 to 47 years. The sample was comprised of 71.3%

Caucasian, 12.6% African-American, 3.9% Hispanic-American, 2.4% Native-American, and 3.5% Asian-American. College freshman and sophomores made up 56.3% of the sample; 20.1% were high school graduates and 20.5% were college juniors or seniors. The typical student in the sample was a white female college freshman or sophomore between the ages of 18 and 21.

Three instruments were used in this study: an attitude scale, knowledge scale, and demographics questionnaire. The attitude scale, used to assess attitudes toward people with AIDS, consisted of 16 items scored on a 5-point Likert scale ranging from strongly agree to strongly disagree. A higher score indicated more negative attitudes. Two questions were included to test for homophobic (a strong dislike or aversion for homosexuals) attitudes.

The knowledge scale consisted of 20 true and false statements and was used to determine the respondent's general AIDS knowledge and transmission knowledge. Higher scores indicated a higher level of knowledge. The demographics questionnaire gathered information regarding age, sex, educational level, religion, political party affiliation, major source of AIDS knowledge, sexuality, race, and whether participants had ever known anyone with HIV or AIDS.

Results

Data were statistically analyzed to identify any correlations that existed between demographic factors, attitudes, and knowledge. Higher levels of AIDS knowledge correlated positively with better attitudes toward people with AIDS. Better attitudes are defined as empathetic and less avoidant, condemning, and economically punitive. African-American students had lower levels of knowledge than white students. Females had higher levels of knowledge and more positive attitudes than men. Homophobia was significant in determining attitudes and knowledge. Responses from older students indicated that they were more knowledgeable about HIV than younger students. Students who had known someone with AIDS had more positive attitudes towards people with AIDS. Another correlation was found between political party affiliation and attitudes. Democrats indicated more positive attitudes, and Republicans indicated more negative attitudes toward people with AIDS.

Discussion

Data analysis suggests that even though the public is fairly knowledgeable about AIDS, their attitudes are likely to be based on homophobia. Assessing various attitudes about AIDS is necessary for designing beneficial educational programs for all involved. Information also needs to be disseminated to dispel the myth that homosexuals have the highest infection rates. Heterosexual women are the fastest growing group at risk for infection, and as long as the homosexual AIDS myth permeates public thinking, it will keep uninformed women from taking precautions against HIV infection because of a false sense of security. We must also ensure that African-American and Hispanic-American communities are targeted for educational programs since it appears there is less knowledge and higher rates of infection in these groups.

Amber A. Lopez
WSU McNair Scholar

A Hispanic Entrepreneur: A Case Study of a Spin-Off Company in Albuquerque, New Mexico

Amber A. Lopez
WSU McNair Scholar
Everett Rogers, PhD, Professor of Communication and Journalism, University of New Mexico
Faculty Research Scholar

This project investigates the formulation and growth of a spin-off company in Albuquerque, New Mexico, founded by a Hispanic individual. For purposes of this study, a spin-off is defined as a

company that is created when individuals and innovative technology leave a parent organization in order to establish a new company. This research examines both unique advantages and special limitations of Hispanic self-identification during the process of establishing a new company. The results of the research may offer insight into the support received and obstacles faced when Hispanics develop technology and begin new, high-tech businesses.

First, to identify spin-off companies in the Albuquerque area, a list of 70 spin-off companies compiled from a previous research project was utilized. Additionally, Entrepreneurial Separation to Transfer Technology (ESTT)—a program Sandia National Laboratories offers to its employees in which a special leave of absence may be granted to an entrepreneur to start a technology-based business or to help expand such a business—provided a list of 60 high-tech spin-off companies that have evolved as a result of the ESTT program. Second, in an attempt to further identify Hispanic entrepreneurs, meetings with several organizations such as Technology Ventures Corporation (TVC) and New Mexico Native American Business Development Center (NMNABDC) were held. Finally, criteria for selection of a Hispanic entrepreneur was determined. The criteria for the entrepreneur included that the individual be (a) of Hispanic ethnicity, (b) in charge of operations at a high-tech spin-off company located in the Albuquerque area, and (c) a former employee of a Federal Research and Development Laboratory.

After completing this networking process, the conclusive decision was made that Evaristo J. Bonano, PhD, President of Beta Corporation International, fulfilled the requirements of the criteria and was the best qualified candidate for this case study.

To access information regarding Dr. Bonano's background and details about his company, a questionnaire consisting of 17 questions was created and used in an interview with him. Information for this paper was gathered through the interview and from a Beta business packet.

Originally from Puerto Rico, Dr. Bonano received his Bachelor of Science in Chemical Engineering from the University of Puerto Rico in 1975. At this time, he moved to upstate New York and obtained his Master's and PhD in Chemical Engineering from Clarkson University, completing his dissertation in 1980. In 1983, Bonano relocated to Albuquerque, New Mexico, and began working at Sandia National Laboratories. At SNL, Bonano became a Division Supervisor and was later promoted to Department Manager in environmental work.

In 1993, Dr. Bonano seized the opportunity to start his own company. He founded Beta Corporation International (Beta), a small minority-owned international, environmental, engineering, and management consulting company. Bonano, President and Chief Executive Officer, is responsible for the development and execution of technical projects and for the management of the company. Beta currently employs 36 individuals and is expanding its work force. In a growth mode, Beta is listed tenth in New Mexico's fastest growing technology companies. Main headquarters of Beta are in Albuquerque. Other office branch locations include Washington, DC; Los Alamos; San Antonio; San Juan, Puerto Rico; and a few other branches across the country. Thirty percent of the business is generated from international industry. Beta has executed business projects in England, Austria, Russia, Korea, and the Czech Republic. Beta has a joint venture in Spain as well as contracts with a U.S. company in Mexico. The Department of Energy is also a client via SNL and Los Alamos National Laboratories.

The company started as a strictly environmental risk assessment and application with an emphasis in radioactive waste disposal. Through the five years of its existence, Beta has expanded their areas of expertise. For example, Beta's software development has grown rapidly. Beta now offers specialized software for the environmental safety and health needs of clients. In the process of developing this software, potential applications were discovered.

As a Hispanic entrepreneur, Bonano has found unique advantages and special limitations in the process of establishing and expanding Beta. Raised in a Hispanic, collectivistic culture (a culture in which group goals are valued over individual goals), Bonano reported that an attitude of collectivism was not an advantage in his entrepreneurial career. To start his company, Bonano had to follow his own dream. On the other hand, Bonano benefited from his Hispanic background. Because Bonano is bilingual, he is able to conduct business outside of the United States. He reported that there are tremendous business opportunities in South America; thus, speaking Spanish fluently is a definite advantage.

Initially, Bonano experienced limitations when dealing with financial institutions. Because banks did not want to take a risk with a new company

like Beta, the company's loan applications were rejected. As a result, capital to begin Beta was drawn from Bonano's personal investment. Once the company began to expand and chances for success were more likely, lines of credit and SBA loans were accessed. Bonano indicated that as a minority he has to work harder to obtain capital and resources, and that there is not a level playing field. He mentioned that it is a challenge for a small company to compete with the "big guys."

Bonano attributes several reasons for the success of his company. Beta is able to identify the needs of present and prospective clients and develop products to meet those needs. The company successfully uses a streamlined approach, for example, employees make decisions to meet immediate needs of customers instead of waiting for approval of higher authorities or committees. In addition, Beta is selective in the work it accepts, an approach that keeps the company consistent with its capabilities and expertise. As a result, clients remember that Beta was there for them and solved the problem.

In summary, Bonano has encountered unique advantages and special limitations of Hispanic self-identification during the process of establishing a new company. Because Bonano is bilingual, he is able to conquer language barriers and tap into an international market to conduct business, which is a definite advantage. Working harder to obtain capital and to find financing is a disadvantage, but he has overcome these financial obstacles. Faced with opportunities and challenges in the formation and growth of his spin-off company, Beta Corporation International, Dr. Evaristo Bonano has fulfilled his dreams. He provides an exemplary example of how a Hispanic entrepreneur can succeed.

Finally, further investigation of this preliminary research is warranted. The project is unique in nature, and there appears to be minimal previous research regarding the topic.

Currently, three other students at the University of New Mexico are conducting case studies with similar criteria, intending to write one collaborative paper to compare and contrast the findings. At the completion of this collaborative research, further information, insight, and recommendations will be provided.

Diana Nguyen
WSU McNair Scholar

Assistive Technology: A Benefit to the Disabled

Diana Nguyen
WSU McNair Scholar
Janet Wetta, Educational Coordinator, Public Health Sciences
Linda Black, Interim Chair, Physical Therapy
WSU Faculty Research Scholars

Assistive technology provides an effective means of independent living for persons with disabilities. The Device Lending Library of the Cerebral Palsy Foundation in Wichita, Kansas, is one of the many unique assistive technological establishments in the nation. By offering the equipment on loan, the Device Lending Library provides specialized equipment to assist individuals with specific activities such as self-care, occupational activities, and classroom activities. Often, such equipment is expensive and not always covered by health insurance. The Device Lending Library allows persons with disabilities to check out specialized equipment that fits their needs and to test them under actual conditions before purchase. Usually the equipment is loaned for a month or more depending on the needs of the individual.

The library provides more than 700 types of equipment, yet only 350 pieces (approximately) are loaned out yearly. The upcoming foundation grant proposal for the 1998-2003 budgetary period needs to substantiate the importance of the library in order to keep its funding adequate. Concerns that the library is under used must be raised in order to assess whether the Device Lending Library actually meets the demands and needs of the community. This study examines these concerns and provides a comprehensive evaluation.

Methods

The target population was randomly chosen for this study from DLL's database client list. These participants included clients with disabilities as well as professional providers of those with disabilities who have checked out a device from DLL in the beginning of 1997. The sample population consisted of males and females, ages 12 to 83, with permanent disabilities ranging from cerebral palsy to hearing impairments.

An outcome evaluation was designed to obtain an idea of the client/user abilities and disabilities and how DLL has affected the individual's independent lifestyle. An idea of the major functional skills deficits was identified to determine and plan assistive technology devices and services to target the specific skilled areas (Smith, 1996).

An outcome evaluation was designed to gather collective feedback on the services of DLL. The evaluation consisted of a two-part survey. The consumer questionnaire consisted of eighteen questions that pertained to the services of DLL. The equipment questionnaire consisted of eleven questions which pertained to the equipment loaned. Thirty-five surveys along with cover letters were mailed.

Results

From the equipment survey, 18 out of 35 reported that 94% of the clients felt that the choices of equipment were adequate in providing for their needs. Only 6% of the respondents were unsatisfied with the selection of devices. Of the respondents, 79% felt that the equipment worked well, while 21% said the equipment did not work for them. Some of the reasons included the equipment not being accessible to the client, or as one person stated, "The equipment was not a right fit." A total of 81% reported the equipment enabled them to perform their desired activity. Of those that were dissatisfied, several requested instructions to accompany the equipment. One person commented on a page turner they checked out as being "too bulky—the student using it is in a wheelchair with a tray, and the page turner is too big." When asked if the client would spend his or her own money to buy the equipment, 59% responded yes. Overall, 94% said they would check out equipment from the library again.

From the consumer questionnaire, 57% checked out equipment for self-care, 52% for classroom activities, 24% for occupational use, and 19% for communication purposes. When asked about the overall services of the library, 70% rated DLL excellent, 20% good, and 5% rated the library as fair. Of the respondents, 58% rated the library staff in their knowledge and assistance in finding the right equipment as excellent, 37% good, and 5% fair.

Discussion

The federal definition of assistive technology delineates two important components, devices and services of AT (Smith, 1996). There is an outcome for each. A device may prove somewhat successful in solving a certain problem and it may be better utilized compared to another device. However, the device itself is only a single component of the problem. The way the device is applied and the techniques implemented are equally important. The successful use of a device is dependent upon both of these components in order to get a complete outcome measurement. "If a funding agency were to read that an AT intervention was studied and the outcome data revealed that it had little effect, funding for the AT might be in jeopardy" based solely on one component (Smith, 1996).

Conclusions and recommendations may be drawn from this research. Because negative responses on the surveys may depend on whether or not the individual was properly trained in the use of the devise, providing training sessions to improve use of the equipment is recommended. Additionally, instruction manuals should be available with all loaned equipment, and product literature should be available upon request.

From the results of the surveys, a majority of the respondents believed that the DLL has been very effective in providing for their needs. DLL has not only provided useful equipment for independent functioning, but it has also provided valuable services as well. These services include consultations, referrals, and academic outreach and awareness. Above all, since researching with the director of DLL, Leah Ross, I have felt a sense of compassion and caring from the department towards those with disabilities. It is not just a job; it is a real part of life. In short, those who work in DLL continually strive to improve their services and to educate the public.

References

DeRuyter, F. (1995). Evaluating outcomes in assistive technology: Do we understand the commitment? *Assistive Technology, 7.1,* 3-8.

Jutai, J., Ladak, N., Schuller, R., Naumann, S., and Wright, V. (1996). Outcomes measurement of assistive technologies: An institutional case study. *Assistive Technology, 8.2,* 110-120.

Nosek, M., and Krowskop, T. (1995). Demonstrating a model approach to independent living center-based assistive technology services. *Assistive Technology, 7.1,* 48-54.

Smith, R. (1996). Measuring the outcomes of assistive technology: Challenge and innovation. *Assistive Technology, 8.2,* 71-81.

Trachtman, L. (1991). A review of practices among information resource programs on assistive technology. *Assistive Technology, 3.2,* 59-66.

Kristi K. Oberg
WSU McNair Scholar

Scholarship and Activism: Theories of Feminist Peace Movements

Kristi K. Oberg

WSU McNair Scholar

Carol Wolfe Konek, PhD, Associate Professor of Women's Studies

WSU Faculty Research Scholar

In feminist movements there is a spectrum of thought ranging from scholarship to activism (also know as theory and practice). Scholarship is sometimes seen as based solely in theory with no application outside academia, while activism is often associated with radical feminism and is criticized for having no connection to feminist theory (Woehrie, 1996). Both feminist scholars and activists assert that unifying academics and activist movements might better empower women.

This research examines theories of activism and scholarship in feminist leadership peace movements. The goal is to provide a historical overview of feminism, including a discussion of modern day feminist peace movements and the nature of activism and scholarship.

One of the earliest records of feminist thought was published in 1789 by Olympe de Gouges during the Enlightenment. De Gouges' book, *Declaration of the Rights of Women,* was written in protest to the French revolutionists' failure to mention women in their *Declaration of the Rights of Man.* Later, the first women's rights convention was held in the United States in 1848, accelerating the suffragette movement which eventually resulted in U.S. women obtaining the right to vote in 1920.

Feminists have been involved in many reforms such as abolition, labor, birth control, the agrarian movement, and housing, but few feminists supported these reforms as actively as they did peace. In 1915 early feminists founded the Women's Peace Party with the mission statement: "The purpose of this organization is to enlist all American women in arousing the nations to respect the sacredness of human life and to abolish war" (Craig, 1994, p. 379). This work has been sustained by feminist scholars and activists through the United Nations conferences for women in 1975, 1985, and 1995. These global conferences were organized around the themes of peace, equality, and development, and brought together delegates and non-governmental organizations.

Leadership of feminist peace movements is collaborative, egalitarian, and loosely structured, and integrates ethical and political perspectives (MP1). According to feminist scholars and activists, this type of leadership contrasts with male centered hierarchical peace organizations. Feminist peace movements avoid the hierarchical structure because they feel it is both unequal and dominating (Iannello, 1992).

The most notable form of activism in feminist peace movements has been the use of immediately effective acts to achieve a social or political end—in other words, direct action. One of the most famous direct action sites has been the Greenham Women's Peace Camp constructed outside the fences surrounding the Royal Air Force base in Greenham, Britain. The peace camp was the result of the 1979 NATO decision to send the American Cruise Missile, a first strike nuclear weapon, to Britain. A few other direct action activities have included the Women's Pentagon Action, the Romulus Peace Encampment, and the Women's Resistance Camp in Hunsruck, West Germany (Long & Myerhof, 1985).

Emergent theoretical perspectives in feminist peace movements include Equality, Essentialism, and Poststructuralism. The equality position asserts that gender differences should be minimized to insure equity for women in education, employment, and the law. The essentialist position holds that women are essentially different from men due to their nurturing qualities and mothering responsibilities and that these differences put women at an advantage in peace work. Finally the poststructuralist position asserts that the categorization of women must be avoided all together because language itself is socially constructed; therefore, such categories are not natural or reliable (Forcey, 1991). Feminist peace theory expands traditional definitions of violence studied in peace research to include personal violence and structures of violence that affect women in particular (Woehrie, 1996).

In recent history, the main focus of both activism and scholarship in feminist peace movements has been to reduce nuclear proliferation. Theorists have studied language, history, philosophy, and various ideologies in an attempt to create strategies towards this effort. Activists have organized demonstrations, marches, and peace camps to raise awareness and bring attention to these same issues. The combined efforts of activists and theorists have increased women's attention to international relations and have raised public awareness of how resources are diverted from social causes to military proliferation.

● References

Craig, J.M. (1994). The women's peace party and questions of gender separatism. *Peace and Change, 19.4,* 373-399.

Forcey, L.R. (1991). Women as peacemakers. *Peace and Change, 16.4,* 331-335.

Iannello, K.P. *Decision Without Hierarchy.* New York: Routledge, 1992.

Long, E., & Myerhof, B. (1985). The *Feminication of America.* Los Angeles: Jeremy P. Thatcher, Inc.

■

Mary L. Romero
WSU McNair Scholar

Learning from the Learners: Preparing Neighborhood Health Workers Through Modeling Chains

Mary L. Romero
WSU McNair Scholar
Tony Pickard, PhD, Assistant Professor of Public Health Sciences
WSU Faculty Research Scholar

All too often graduate field work practicums use disadvantaged neighborhoods as experimental laboratories while providing minimal benefits to the community or its residents. It is not surprising that the residents become distrustful and reluctant to participate in short term research projects. This study involves a more sensitive approach in which graduate students engage in public health practice referred to as "modeling chains." In the modeling chain process, students recruit and train residents from impoverished, inner-city neighborhoods to help provide desperately needed health care resources—a practice which benefits the students and the community.

Based on the premise of mutual benefit, the modeling chain was implemented by community members and Wichita State University students from several disciplines (e.g., public health, medicine, and physical education) in a pilot project which involved the Wichita, Kansas, neighborhood of Planeview. The goals of this Planeview project were to improve the quality of desperately needed health care and to provide a job training program. Emerging from this pilot project was a coalition of community members and Wichita State University students who created Healthy Options for Planeview (H.O.P.). The H.O.P project is a community-university partnership that addresses the health care needs (specifically, homebound individuals and those suffering with asthma) of the Planeview community. This paper discusses two pertinent issues: (a) diverse problems in the community of Planeview and (b) goals of H.O.P. to curtail these problems.

The neighborhood of Planeview consists of 4,246 residents and is one of the poorest and most culturally diverse communities in Wichita. According to the most recent census report, the poverty rate for families in Planeview was 38%, compared to 9.5% for the rest of Wichita. Unemployment is higher and education levels are lower in this neighborhood than in other areas of the city. Planeview is faced with multiple problems such as poverty, unemployment, crime, drugs, and poor housing and health conditions.

H.O.P.'s first goal in working in Planeview is to discover ways to assist families with children who are at high risk of asthma and to develop a plan to reduce this health problem. Prior evaluations in Planeview revealed that children residing in the neighborhood have more asthma than any other area in Wichita. Therefore, a health assessment was developed to identify households with children at risk for asthma and diagnosed with asthma. Preliminary assessments indicate that 30% of all households surveyed thus far had children diagnosed with asthma and 10% had children with symptoms of asthma (for unknown reasons these children were not diagnosed). These data support previous findings and verify that asthma is a serious health issue needing to be addressed.

The second goal of H.O.P. is to bring in-home care to individuals of all ages who are homebound due to health or other social causes. A previous study indicated that Planeview has more homebound residents than any other area in Wichita. H.O.P. is conducting door-to-door health assessments to identify homebound individuals who need assistance but do not have information about available resources or services which may help meet their needs. H.O.P. has developed information packages which is left at every home after an assessment.

Because this project is in the preliminary stages, the data collected thus far are not sufficient to provide the necessary information to address these problems adequately. After community-wide health assessments are completed, H.O.P. will be able to deal with the problems more efficiently.

Finally, the most ambitious goal of the H.O.P project is the development of a training program for

Planeview residents as public health workers. The H.O.P. project plans to teach residents how to find people who are at risk for childhood asthma or homebound status. In addition, the public health workers will link these individuals with one of the available outreach services such as the neighborhood's Brookside Medical Clinic. Because many of the residents in Planeview may not speak English, H.O.P. plans to train community members who are representative of the multi-cultural and multi-lingual groups living in Planeview.

H.O.P. is a partnership of dedicated people who envision improving the quality of health care for residents in the poverty stricken area of Planeview. The H.O.P. project will operate in joint sponsorship of the Brookside Medical Clinic, Department of Public Health Sciences at Wichita State University, and the coalition of university students and community residents who continue to devote their time, skills, and efforts to seek funding for this project. The funding of this project will benefit the Planeview area by strengthening its economic power with new job skills and decreasing health risks, and it will give an opportunity to prepare graduate students for public health practice. Through the modeling chain approach, there will be benefits for both parties involved, and, finally, this approach will build more trusting relationships between researchers and studied populations.

References

Rosenstreich, D.L. (1997). The role of cockroach allergy and exposure to cockroach allergen in causing morbidity among inner-city children with asthma, *New England Journal of Medicine, 336,* 19.

Taylor, R. (1994, April 26). What the neighborhood needs most of all: Hope. *Wichita Eagle and Beacon,* p. 9A.

Pamela Sparlin
WSU McNair Scholar

How Not to Cry in French Class

Pamela Sparlin
WSU McNair Scholar
Sabrina Brasseur, Lecturer, Modern and Classical Languages and Literatures
WSU Faculty Research Scholar

The Non-Traditional Student Association (NTSA) frequently receives cries for help from students in their struggle to learn a language of another culture. For the non-traditional student (According to the NTSA, a non-traditional student is "a student who is between the ages of 24 and 59 years old and has been out of school for three or more years."), learning a new language such as French can seem impossible. Because many adults in our culture have not been exposed to other languages as children, they cling to their own way of thinking and speaking. Difficulties emerge in the classroom for both teachers and students in the search for success in learning French. The learning process is a joint effort, a dance, between the student and teacher. The dance flows when the student takes the responsibility to learn while the teacher directs, supports, and encourages the student's progress. This project explores this dance. Visual aids and learning techniques suitable for both teaching and learning will be discussed.

This paper delineates motivating and interesting techniques students may use to help them succeed in French class. First, I discuss how visual aids helped me in learning French, and then I tie these experiences to current research. Three of the visual aid memory devices that helped me learn and could be adapted for others in the classroom are (a) color, (b) interest areas, and (c) story line.

Use of Color as a Memory Device

Color is a good memory device. Since one of my main problems in French was remembering the difference between masculine and feminine French nouns, I color coded each new word with cut-outs of the items in pink and blue construction paper and taped them to my wall. By the end of the term, my room appeared to be papered in pink and blue wallpaper, but I was able to better remember which items were masculine and which were feminine by using colors.

Use of Interest Areas as a Memory Device

To learn housing and furniture terms, my class designed our own dream house. I designed a house with furnishings exactly as I would like to have them and then described them in a French paper. I found myself remembering the French terms better as I pored through French magazines and perused pictures of home furnishings, paint colors, and period decorating.

Another area of interest for me was utilized in a 10-minute presentation in my French conversation class. I needed to speak on a subject which sparked my interest so much that I could forget my efforts of trying to speak in another language. I have always been interested in color charting, the method of finding a person's best clothing and make-up color choices—so, using the principles of color charting, I made paper dolls to resemble each person in my class. I dressed the dolls with my guess of their best colors. It helped to clutch the paper dolls in my hands as I described clothing, hair, skin, and eyes in French to my classmates.

Use of Story Line as a Memory Device

When I needed to remember a set of 17 French verbs, I utilized a story line of a family vacationing in Colorado. Each verb represented an activity the family engaged in while on the vacation. I made cut-outs again for a poster board and, as a result, I could remember the verbs by picturing the poster.

Another story line that worked well for me was an assignment to write my own French fable. We wrote the story line, condensed it to verse, illustrated it, and then I set my verse to music. This worked well for me because it used several mediums together: writing, art, and music.

Combining Practical Experience and Research

Using these visual aid memory devices worked well for me in learning French. I found supporting evidence in research that confirmed what I had discovered in my personal experience. Additionally, the research articles contained other concepts I found especially insightful.

Schlick-Renner and Truscott (1994) wrote about their use of suggestopedia to help adult students learn French. Suggestopedia emphasizes a stress-free learning environment and advocates incorporating poetry, art work, and song in the learning process. Stress-free classrooms and assignments such as writing a French fable and a French poem worked very well for me.

Palmunen (1995) discussed her success in teaching students by using the *French in Action* video series. The FIA series is like a sophisticated Sesame Street for adult students. The videos depict real people in lifelike situations in France and use a variety of learning tools such as art, music, and cartoons. The videos are helpful to students who are self-directed and motivated to learn.

Finally, in their article about how to increase teaching effectiveness, Dudney (1995) and associates said, "Any change of status concerning independence can become a significant psychological problem for an adult" (p.2). I found this to be all too true in my experience as a returning student. Because I was so uncertain of my abilities to learn French and had not attended school for 30 years, I became like a child totally dependent on others for a time. For me to succeed in French, I had to put my pride in my pocket, learn from others, and just have fun in French class.

Summary

Students learn best in their own way. I really struggled in French class until I discovered the methods and techniques that worked best for me. It is important for adult learners and instructors of these learners to understand the unique strengths and challenges that are carried into the classroom. Identifying strengths and interests helps to design an experiential learning program for students, so even if their whole first year in French class is spent with tears running down their face, they, too, can learn to succeed.

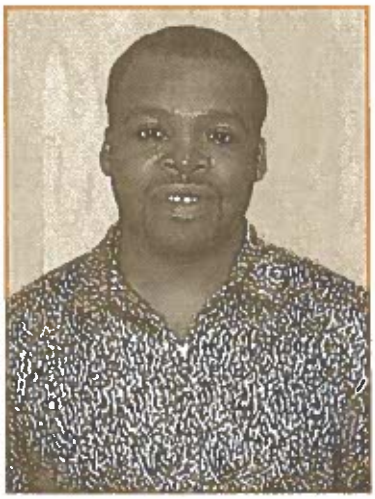
Bonne chance!

References

Dudney, G., Funke, M., & Kynast-Funke, R. (1995). *How to increase your teaching effectiveness immediately—no joke!* Paper presented at the annual Meeting of the American Council on the Teaching of Foreign Languages, Anaheim, CA.

Palmunen, K.F. (1995). From dependency to self-directed learning: Implementing an elementary French program for adults in the weekend college. *Foreign Language Annals, 28,* 348-359.

Schlick-Renner, M., & Truscott, S. (1994). Accelerated learning, suggestopedia and the adult student. *Language Learning Journal, 10,* 52-54.



Jimmy Walker
WSU McNair Scholar

Reimbursement for Long-Term Health Care

Jimmy Walker
WSU McNair Scholar
James Swan, PhD, Associate Professor of Public Health Sciences
Bonnie Holaday, PhD, Professor of Nursing
WSU Faculty Research Scholars

According to the U.S. Bipartisan Commission on Comprehensive Health Care, long-term care refers to any array of services required by individuals who have lost some capacity for independence due to a chronic illness or condition. Long-term care consists of assistance with basic activities and routines of daily living such as bathing, dressing, meal preparation, and housekeeping. These services can be provided in a variety of settings (the individual's home, the community, or an institution), and regardless of the diagnosis, the need for long-term care can be measured by assessing limitations in an individual's capacity to manage tasks of daily living.

Between 9 million and 11 million Americans of all ages are chronically disabled, dependent on others for help in the basic tasks of daily living. As many as 4 million people are so severely disabled that they cannot survive without substantial help from others. If disability rates remain the same as they are today, the number of elderly persons needing help with basic tasks is expected to double by the year 2030, increasing from about 7 million to 14 million. The number of elderly requiring nursing home care will more than triple, rising from about 1.5 million to 5 million. Growth in these numbers makes the nation's financing of this care imperative for the well-being of all Americans.

Yet despite the enormous efforts of disabled individuals and their families to manage at home, sometimes long-term care such as nursing home care becomes inevitable. At that point individuals and families face not only emotional but also financial devastation. However, two government programs, Medicaid and Medicare, are expected to help ease the financial burden that is associated with long-term care. Unfortunately these federal programs have various guidelines and restrictions that prevent them from being much help to many individuals.

Medicare, the federal health insurance program for the elderly, contributes a negligible amount toward the cost of long-term care. Medicare protects the elderly and some non-elderly—those disabled people fighting against financial loss when they need hospital or physician care—but does little to help with long-term care such as nursing home expenditures.

The largest single source of government support is Medicaid. Medicaid accounts for 90% of all public spending for nursing home care and more than 60% of the public dollars expended on home health care. Medicaid is the primary source of nursing home financing, but it does not protect people from impoverishment; it finances their care only when impoverishment occurs. Almost 45% of the elderly's out-of-pocket health costs goes for insurance premiums, including Medicare.

Health care is a business. And much of what that business is reflects health care and its cost. Researchers have examined the correlation between the reimbursement methods and long-term care expenditures and have found that reimbursement mechanisms have an enormous impact on long-term care expenditures.

Reimbursement mechanisms refer to those methods used by Medicaid and Medicare programs to pay for care. Several payment method categories are used: a retrospective method in which payment is the traditional manner of reimbursement based on costs determined after care provision; a prospective method, or flat-rate, in which rates are set for types of facilities in a state; a prospective, facility-specific method in which rates are set by facility, generally based on cost reports from early rate periods; a combination method in which rates are based on cost centers that are either reimbursed prospectively or retrospectively; and an adjusted method in which rates are set prospectively, as well as routinely, to allow for upward adjustments in the rates during or after a rate period.

In states with either retrospective or prospective facility-specific reimbursement, routine nursing home operating costs tend to be higher; in states with prospective-class reimbursement, these costs tend to be lower with more Medicaid patients. Class reimbursement methods may be adopted by states with historically higher nursing home costs or with higher nursing home costs outside the Medicaid market. It has also been found that higher coverage of Medicaid nursing home patients occurs in states with prospective facility specific systems; however, states with prospective-class methods have lower Medicaid proportions of nursing home patients, compared with retrospective Medicaid methods. Compared with retrospective methods, prospective-class methods are associated with greater difficulty of admitting Medicaid patients; whereas prospective payment generally appears to make it harder to admit higher acuity patients. Prospective reimbursement systems allow greater control of increasing rates. There is also evidence that adjusted systems (those setting prospective rates but allowing upward adjustments during the rate period) show greater control over rates than do retrospective systems.

The major thrust for many state Medicaid nursing home reimbursement methods has been oriented primarily to keep rates low in order to contain expenditures. However, rates and methods appear to be more reflective of state budget balances and overall state resources, which may vary with times of scarcity and abundance, than tied to the actual costs of providing nursing home care. Failure to reform the system will not only abandon today's elderly and disabled but will also condemn growing numbers of Americans to inadequate access to care in the future. More work is needed on the design of a payment system for nursing home care.

WICHITA STATE UNIVERSITY

The Metropolitan Advantage

Notice of Nondiscrimination

Wichita State University does not discriminate in its programs and activities on the basis of race, religion, color, national origin, sex, age, or disability. The following person has been designated to handle inquiries regarding nondiscrimination policies: Director, Office of Equal Employment Opportunity, Wichita State University, 1845 Fairmount, Wichita, Kansas 67260-0145; telephone (316) 978-3371.

Produced by the Office of University Communications 10/98