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Foreword

The McNair Scholars Program was named for Ronald E. McNair, a man who overcame numerous obstacles to realize his dreams. Despite his lack of financial resources, McNair was just 26 years old when he earned his Ph.D. in laser physics. He went on to become a recognized expert in his field, as well as an NASA astronaut. His life exemplified dedication, academic excellence, and vision. Dr. McNair was a crewman on the last Challenger space shuttle mission. His legacy lives on in the program that bears his name.

The CSUS McNair Scholars Program is a federally funded, two-year program designed to prepare eligible CSUS students for admission to and study at the doctoral level. The program offers several benefits, including GRF preparation, faculty mentoring, and stipends for summer research projects.

Our McNair Scholars have received several awards, including the Sally Casanova Pre-Doctorate Award and the COMPACT for Diversity. They also belong to organizations, such as the Epsilon Phi Honor Society, that recognize their pursuit of academic excellence.

Our scholars embarked on their educational journey with expectations of receiving a baccalaureate degree. With the assistance of the McNair Scholars Program, these same acheivers are now planning to complete doctorate degrees in their chosen fields of study. The CSUS McNair Scholars Program is helping these students realize the next phase of their journey toward reaching their expanding dreams and realizing their full potential.

Chevelle Newsome, Ph.D.
Director
McNair Scholars Program
A Brief Study of Health and Disease within Two Native American Indian Populations in the State of California

Laura M. Rader

Abstract

When I first decided to make anthropology my major field of study, I was fascinated by the idea that it was possible to look at skeletal material and determine how someone had lived - what they ate, what diseases they had during their lifetime, and the type of environment in which they lived.

California has had a long history of indigenous populations, attributable to its mild climates, and the availability of rich food resources. The two populations of Native American Indians to be studied lived in the Central California Valley during the Early Middle Horizon (2900-1690 BP) and Late Middle Horizon (2800-1200 BP). The focus of this research is to determine, by studying the skeletal tissue of these two populations, the pathology and trauma evident at time of death; and also to determine what correlation these pathologies and traumas had to the subsistence strategies and sexual division of labor within and between populations. Deductions will then be made with regard to their environmental processes, religious practices, and lifestyles. These findings will then be added to, and in turn increase the database material available for study by future generations of scholars.

Introduction

Evidence of diet, health, and ecological conditions can sometimes be determined through the analysis of human skeletal remains. Learning from the bones of past inhabitants give more specific, less speculative information about the individual's health, particularly for periods of our history when historical documentation was not present. Studying the skeletal remains of our ancestors provides access to a window into the past -- depicting the daily activities of our predecessors. Through the examination of human skeletal remains we are often able to determine the subsistence activities, environmental processes, religious practices, and lifestyles of past peoples.

This researcher has long harbored an interest in the field of anthropology, especially physical anthropology. The main focus of this
interest has centered on the peoples of the North American continent; therefore, choosing this subject as a research project came about quite naturally. There is a solid foundation of previous research (focused on different ecological zones) that can be drawn upon for comparative information. Once the historic placement in time has been determined, all that remains to be done is to survey the skeletal material available for the research and then begin a critical analysis of the findings. Specific questions can be addressed, and hopefully answered, in the process of the analysis. New findings will be added to and, in turn increase the database material available for study by future generations of scholars.

The focus of the skeletal research for this project concentrates on all skeletal material both cranial (skull) and post cranial (neck to toes) anatomical paleopathologies (diseases) and traumas (stresses on bone tissue). Studying the appearance of skeletal remains may allow a determination to be made about the health of the individual. For example, if little or no dental caries (cavities) are present, this indicates that the individual was not consuming foods containing high levels of sugar. By categorizing the various bone anomalies (abnormalities), certain tentative conclusions can be reached regarding overall health, as well as prevalent diseases and stresses occurring within the lifetime of the individual.

Information from this type of research can be used to determine how these diseases and stresses may relate to the subsistence strategies (hunter gatherer, sedentary farming, herding, etc.) of these individuals. For the purpose of this research, Native American Indian peoples living in two dissimilar areas (called ecological zones) within the state of California have been chosen. The time period for these study groups lies within the early middle horizon (2900-1690 BP) and the late middle horizon (2800-1200 BP).

Prior research has speculated that the advent of agriculture brought to the hunter/gatherer societies an easier lifestyle. Perhaps it did, but with a trend toward more sedentary lifestyles it also brought a higher ratio of death and disease (e.g., Armelagos 1990, Hibbard, 1998). One of the reasons for this is the cultural change that takes place within a society when more sedentary lifestyles occur. They can produce stress on a population. For example, the shift from hunting and gathering to intensive agriculture increases the potential for nutritional deficiencies and infectious disease. These physiological disruptions to cultural norms are the primary cause for such diseases as porotic hyperostosis (iron deficiency anemia) (e.g., Martin and Armelagos, 1985).
Review of Literature

Historical Background

The two archaeological sites to be examined are CA-SAC-29 and CA-SJO-91. These two sites are located in the Delta regions of central California: CA-SAC-29 in the Sacramento Delta and CA-SJO-91 in the San Joaquin Delta (See Appendix 1). Background information for these two sites has been gathered, in part, from theses written by prior students of California State University Sacramento.

Before 1850, the Delta area of the Sacramento Valley region was covered with a freshwater marsh of tules. River channels, then as now, breached their natural levees to flood onto adjacent lands. Levees and natural ridges were covered in sedges (graisilike plants), reeds, and woody hydrophytes (water plants). It is these natural levees (high ground) that attracted the prehistoric inhabitants to occupy these sites (See Appendix 2). The people from CA-SAC-29 and CA-SJO-91 lived within this area and were within reach of several biotic zones. A biotic zone includes within its region various combinations of elevation, rainfall, climate, and certain plants and animals, all of which provided a diverse base from which to choose dietary resources (e.g., Hibbard, 1998) (See Appendix 3-7). The Native American Indian tended to set territorial lines within several of these biotic zones - thus achieving for the group optimal foraging throughout seasonal changes.

Archaeological Site Locations

CA-SAC-29 (King Brown Site)

Located at a bend of the Sacramento River on a natural levee with a slough on one side and the winter overflow from the river on the other, this marsh and river overflow area once retained standing water into the middle of summer. The site has been identified as belonging to either the Miwok or Nisenan cultures (e.g., Hibbard, 1998).

This site was first excavated in 1939, with a second phase of excavation taking place between 1954-1956, and a final excavation in 1967. The site contains the remains of approximately 30 individuals, and appears to have been settled comparatively early (2800-1200 BP carbon dated) with continuous settlement up to the historic period. Features include hearths, cooking stones, house floors, faunal remains of various mammalian bones, and the aquatic remains of fish, mussels, and waterfowl (e.g., Hibbard, 1998).
CA-SJO-91 (French Camp Slough Site)

This site lies on the southern bank of French Camp Slough, with the San Joaquin River ¼ mile away. As with CA-SAC-29 the site is on an elevated mound and close to adjacent waterways, between both river and slough (e.g., Hibbard, 1998).

This site also contains the remains of approximately 30 individuals, and was settled originally in the Early Horizon (4500-2800 BP). The skeletal samples to be examined, however, date from the Early Middle Horizon (2900 1690 BP). Features include a burned acorn cache, baked clay and rock, bowl mortar, and pestles polished by use with wooden mortars. Faunal remains include elk, deer, rabbit, beaver, fox, skunk, mink, porcupine and coyote. Aquatic resources are turtle and a variety of waterfowl and land birds (e.g., Hibbard, 1998) (See Appendix 8).

Ecology

During the Early Middle Horizon period a change in subsistence patterns occurred: an economic cycle of food storage in the form of acorn harvesting. This cycle can be compared to a semi-sedentary lifestyle, as it requires a certain degree of settlement patterning to accommodate the storage and use of geographically located resources. This semi-settlement patterning, in the form of storage economy, was a compromise to the health of the individuals. For example, dental caries result from intraoral fermentation of carbohydrates, which are the major dietary component of acorns. Thus, an increase in the number of tooth caries present within a population is seen in connection with changing from a meat to an acorn subsistence strategy (e.g., Schulz 1967, El-Najjar 1976, Eisenberg, 1991).

The change to a storage economy, although hazardous to the health of the individuals at these two sites, was not as detrimental, as compared to a full sedentary economy, because other means of subsistence continued to be paramount to their ecology.

Although the economic focus of the King Brown and the French Camp Slough sites was to an availability of food resources within the immediate biotic zone, additional resources were also available in adjacent biotic zones. These zones consisted of riparian woodland, valley grassland, and oak woodland (e.g., Schulz, 1981). These additional zones provided the iron-rich resources necessary to offset dependency on the acorn, and further provided almost year-round availability of food resources. Lean times for these individuals, though they did occur, were infrequent.
Technology

Technological assemblages (the tools of a culture) found at the two sites provide strong indications as to the types and quantities of food products consumed by the populations. For instance, the presence of mortars (a vessel or hole in a rock surface) and pestles (club-shaped, handheld tools), such as those found at the French Camp Slough Site (e.g., Hibbard, 1998), are evidence of grinding or mashing substances. Evidence of the burned acorn cache indicates the group's storage and preparation of acorns as part of their subsistence economy. Evidence of hearths (associated with burned mussel shell), cooking stones, steaming basins, four pestles, and faunal remains found at the King Brown Site (e.g., Hibbard, 1998) would indicate that the technology to prepare acorns was present, but that their main staple appears to have been in the form of meat products.

Resource Availability

California has a wide variety of resource availability particularly in the northern area of the state. The primary staple foods for the groups in this study consisted of acorns, fish (fresh and sea water), and large mammals (e.g., Anderson, 1994). To these were added a seasonal availability of seeds and berries of various and numerous kinds. Yearly rabbit and grasshopper hunts were also a major part of their seasonal foraging (called a seasonal round).

CA-SAC-29 (King Brown Site)

This site, located in the southern portion of the Sacramento Valley, had a very wide range of resource availability, so much so that there did not appear to be a heavy dependency upon an acorn subsistence economy. The site encompassed vast areas of both grassland and timberland, and was adjacent to oak woodland and chaparral. The grassland and timberland were instrumental for the growth of various vegetable resources and also provided a prolification of deer habitats. The grassland supported antelope and numerous small game. Along the Sacramento River and its tributaries could be found a large gallery forest of valley oaks with their attendant acorns (e.g., Anderson, 1994). The river also made possible seasonal salmon and steelhead fishing.

CA-SJO-91 (French Camp Slough Site)

The San Joaquin Valley lies at the northern end of the Sacramento Valley, just south of the Delta, and is at or below sea level. Tidal action in the Delta and seasonal flooding along streams produced vast wetlands. This type of ecological zone is conducive to lush swamp vegetation, such as grasses, rushes, and cattails. This, in turn, provides food and nests for
waterfowl and fish. Other seasonal resources included antelope, tule elk, and small game such as mink, weasel, river otter, raccoon, and beaver (e.g., Anderson, 1994). Gallery forests composed of cottonwoods, valley oaks, Oregon ash, and white alder lined the major rivers (e.g., Schulz, 1981), with the valley oaks supplying acorns in abundance.

Pathologies and Traumas

Paleopathologies are ancient diseases, which affect skeletal materials. These disease processes may indicate the nutritional status of the individuals, or may result from infectious processes. Traumas, such as fractures, as denoted within skeletal tissues, may reveal accidental occurrences, acts of aggression, and the repetitive daily activities of the individuals being studied (e.g., Lytle, 1995). The most common disease markers and traumas that may be present within these populations are as follows:

Porotic hyperostosis/cribra orbitalla

Porotic hyperostosis or cribra orbitalla are seen as symmetrically distributed cranial lesions. This creates a thickening of the involved areas of the skull by the expanded diploic (spongy, porous, bony tissue between the hard outer and inner bone layers of the cranium) layer. The outer table (surface) overlying the lesions becomes completely resorbed. This condition can be caused by an iron deficiency in dietary habits (more commonly known as iron deficiency anemia) (e.g., Aufderheide and Rodriguez-Martin, 1998).

Another possible cause, as noted by White and Folkens (2000), is the loss of nutrients associated with diarrheal diseases. Thus porotic hyperostosis, as found in the Native American Indian, may be the secondary consequence of infectious disease, not diet.

Treponematosis (Syphilis)

Syphilis is a chronic or subacute infection caused by a microorganism called spirochetes that is associated with distinctive geographic, climatic, and sociocultural features. Causal effects are: (1) tropical climate; (2) low hygiene level in humid areas; (3) temperate and subtropical nonhumid regions; and (4) urbanized populations in all geographic regions. This disease is fatal, however, if the individual lives long enough, it becomes visible in almost all portions of the skeletal anatomy (e.g., Aufderheide and Rodriguez-Martin, 1998). It primarily affects the cranium and fibulae (leg bones) and leaves a characteristic "worm-caten" or "snail track" appearance to the bones. The origin of syphilis is a long-running debate, which as yet has not been given a definitive answer, though there is speculation as to its
being endemic world-wide.

**Degenerative Joint Disease/Osteoarthritis**

This is a degenerative, noninflammatory, chronic, progressive condition characterized by the loss of joint cartilage and subsequent lesions resulting from direct interosseous (inner bone) contact within diarthrodial (point of bony contact) joints (e.g., Aufderheide and Rodriguez-Martin, 1998). The cause of this disease is usually directly related to stressful activities generated by the individual during his/her lifetime. An example of such activity would be a Native American Indian woman sitting on her knees and her flexed toes, constantly rocking back and forth as she grinds acorns on her mortar.

**Osteomyelitis**

Osteomyelitis is an infectious inflammation of bone and bone marrow caused by pus-producing bacteria. It has a high incidence of occurrence in debilitated individuals and those with injured bones. Mortality rates from this infection were more than 20% before modern curative techniques (e.g., Aufderheide and Rodriguez-Martin, 1998). It is found mostly on the long bones of the skeleton, and is more prevalent in males than females (probably due to greater traumatic stresses within the male populations).

**Periostitis**

Periostitis is the inflammation of the periosteum, which sometimes results from a compound fracture of long bones. Periosteum is a dense fibrous membrane covering the surface of bones, except at the joints, and serving as an attachment for muscles and tendons. Inflammation may be caused by several underlying reasons (e.g., traumas, or infection). This infection can cause the bone surface to appear irregular because of varying degrees of thickness, nodules and pitting on the bone surface (e.g., Aufderheide and Rodriguez-Martin, 1998).

**Fractures**

Evidence of healing is the most useful criterion for determining the ante mortem (prior to death) or per mortem (cause of death) nature of a skeletal fracture (e.g., Aufderheide and Rodriguez-Martin, 1998). Fractures can be the result of daily activities or the result of aggression. If the outcome of either is the death of the individual, the determination of probable cause (death by aggression or death by accident) remains unanswered.
Artificial Dental Modifications

Some cultural practices may impact an individual's dentition. People engrave, color, and even pull out their teeth for cosmetic purposes (e.g., White and Folkens, 2000). On some dentition, wear patterns (indentations) indicative of technological use can be seen. These wear patterns can be caused by holding material (such as deer hide) between the teeth while in the process of preparation.

Enamel Hypoplasia and Dental Caries

Transverse lines, pits, and grooves on the surface of tooth crowns characterize enamel hypoplasia. Dental caries are a disease process characterized by the progressive decalcification of enamel or dentine of a tooth.

Note: Enamel hypoplasia and dental caries will not be covered in this research, except in passing, because they have been more than adequately addressed in the prior research of Hibbard (1998), which covered both of the populations upon which this research is predicated.

Purposes and Objectives

The main purpose and objective of this research is to find, through skeletal analysis, the pathologies and traumas present in both populations of Native American Indians, and how they relate within the environmental setting, subsistence and sexual division of labor, religious practices, and lifestyles of the individuals being studied, insofar as these can be determined for the time periods in question.

Drawbacks to this study may be threefold: lack of enough variability in ecological zones, lack of pathologies and traumas within the population designated for study, and lack of viable population for the study of paleopathologies and traumas present. However, the limitations of the study may not be determined until such time as the material in question is examined under the proposed research conditions.

If there are not enough paleopathologies and traumas found within the groups designated for study, then additional groups will be added in an attempt to maintain the viability of the research. If it is not possible to substantiate the research question, then additional inquiries and/or populations will be used to do so.

Other sources are being contacted to determine the availability of additional skeletal materials from more diverse ecological zones within the state of California. If successful, the problem of diversity will at least be solved, and possibly that of paleopathologies/traumas and the numerical count as well.
Research Question

This research addresses the following questions:
1. What is the health status of two populations of Native American Indians from the state of California as evidenced by the frequency and type of pathologies and traumatic incidences in the skeletal remains?
2. What correlation do these paleopathologies and/or traumas have with the subsistence strategies and sexual division of labor of these individuals?
3. What deductions may then be made with regard to environmental processes, religious practices, and lifestyles found within and among these two populations?

In an attempt to address these posed research questions, this research will be performed through a theory-driven (deductive) approach. Answers to this research question, or many parts of it, already exist within numerous research documents on similar subjects. In addition to providing insight for the current research questions, the careful sifting of existing material, together with additional information gleaned from this research, will further enhance future studies within the same or similar realms of inquiry.

Methodology & Research Design

Intensive examination of two American Indian skeletal samples from California will be undertaken to determine the presence of health and disease as evidenced by skeletal tissues. The determining factors under consideration will be encompassed within criteria set for the ethnicity of the North American Indian.

Sample Size

Each of the two proposed populations contains approximately 30 individuals in adequate condition for study.

Skeletal Material

An attempt will be made, when available, to study as complete an individual as possible, both cranially and post-cranially. When the skeletal material is lacking, the remains that are available will be analyzed for pathologic and traumatic diseases and/or injuries. Emphasis will be placed, for the purposes of aging and sexing each individual, on the dental eruption pattern of the mandible, cranial suture closure, epiphyseal closure, pubic symphysis surface, parturition changes at pubic symphysis, and the ilium's auricular surface (described in detail below).

Determination of paleopathologies and traumas will be accomplished
through visual indices. Examination of the cranium; mandible (jaw); vertebral column, long bones (arms and legs); thorax (sternum and ribs); shoulder girdle (clavicle and scapula); and pelvic girdle (sacrum, coccyx, and os coxae); wherever present, will take place.

**Aging Techniques**

When the following information has been conjoined in chart form, a fairly reliable determinate of the approximate age of an individual at time of death can be reached.

**Dentition Estimates**

Sub-adult: Age may be determined within the parameters of permanent tooth eruption. There are specified times, within a given ethnic group, when tooth eruption occurs. By using the parameters given for dental development in Native American Indians as adapted from Ubelaker (1989), an approximate age at time of death can be determined.

Adult: Once all permanent teeth have erupted, the process of wear begins to occur. If the rate of wear within a population is fairly homogeneous, it follows that the extent of wear is a function of age and can be used in assigning dental age to adult specimens (e.g., White and Folkens, 2000). One drawback to this, of course, is if the individuals being examined used their teeth as part of their technology.

**Cranial Suture Closure Estimates**

Sutures between cranial bones tend to fuse progressively as the individual ages. One feature in particular, the sphenoccipital (sphenoid and occipital bones) synchondrosis (fusion by cartilage), is particularly accurate in that it tends to fuse in 95% of individuals between 20 and 25 years of age. Age estimates can also be accomplished through the use of Buikstra and Ubelaker Standards volume (1994) from White and Folkens (2000), using numerical scoring from 0 to 3, with 0 indicating minimal closure, 1 indicating significant closure, and 3 indicating completely obliterated closure.

**Epiphyseal Closure**

Subadult Age Estimates: An epiphyseal closure is the point at which the ends of the long bones of the leg and arm meet with the shaft of each bone, and upon cessation of the individual's growth fuse completely. This activity is greatest between ages 15 and 23. This fusion can be scored as unfused, ¼ united, ½ united, ¾ united, and fully fused (e.g., White and Folkens, 2000).
Public Symphysis Surface

Adult Age Estimates: The pubic symphysis is located where the two pubic bones (left/right) come together and meet in the midline. The surface of this bone is one of the more widely used determinates of aging. In the young adult the surface of the symphysis is more rugged in appearance and is transversely crossed by horizontal ridges and intervening grooves. As the individual grows older this surface gradually loses its relief pattern and is ultimately bounded with a rim by the age of 35. Todd (1920) used these changes to determine age. He recognized ten phases of pubic symphysis age, ranging from 18/18 years to 50+ years. His method was updated by Suchey/Brooks (1990) and, today, is used widely to age skeletal material.

Not only a fairly reliable indicator of age, the pubic symphysis can sometimes be a reliable estimate of the sex of the individual as well. Childbirth results in changes to the pubic symphysis (particularly pitting adjacent to the symphysis on the dorsal edge of the pubis) (e.g., White and Folkens, 2000).

Auricular Surface of the Ilium

Adult Age: The ilium is the uppermost and widest of the three bones constituting either of the lateral halves of the pelvis. The surface of the ilium is the site of regular changes corresponding to age. The Meindl and Lovejoy (1985) scoring system runs from Phase 1 through 7 for vault, and Phase 5 through 10 for lateral-anterior sites in a progressive pattern. It will be used to age the individuals used in this study. The auricular surface of the ilium is a particularly useful point of aging, in that the ilium is often one of the more completely preserved portions of skeletal materials (e.g., White and Folkens, 2000).

Sexing Techniques

Sexual dimorphism exists in humans and well as other primates, and is a major indicator of the sex of skeletal material. When the following information has been noted and placed side-by-side in chart form, the conjoined information becomes a fairly reliable determinate of the sex of an individual.

Sexing the Skull

Male crania tend to be more robust than female crania. Therefore, looking at areas of the crania, such as the nuchal crest, mastoid process, supra-orbital margin, supra-orbital ridge, and the mental eminence, can determine the sex of the individual. Using a scale (e.g., from Walker in Buikstra and Ubelaker, 1994) from 1 to 5 (with 1 indicating more female
and 5 indicating more male) a tentative conclusion can be made with regard to the sex of the individual (e.g., White and Folkens, 2000).

**Pelvic Sexing**

Female pelvic inlets are relatively wider than those of the male (for the purpose of birthing). The greater sciatic notch on female os coxae is also relatively wider than on the male. Females have relatively longer pubic portions of the os coxae, including the superior pubic ramus, than males. The subpubic angle, formed between the lower edges of the two inferior pubic rami, is larger in females than in males. Finally, the preauricular sulcus is present more often in females than in males (e.g., White and Folkens, 2000). Careful measurements of these areas, together with the use of scales will ultimately determine the tentative sex of the individual.

None of these techniques, taken by themselves, are determinate of the sex of the individual; however, when placed together, an overall consensus can be reached with a high probability of correctness.

Each individual will be sexed and aged according to the above criteria. Intensive examination of recovered remains will be carried out, and all pathologies and traumas will be recorded. Upon completion of the examination of these individuals, data will be analyzed according to sex and age group within and between both populations. An understanding of the pathologies and traumas discovered would allow for correlations and deductions to be made in relation to diet, health, and overall lifestyle of the individuals in the sample populations.

**Procedures**

The human bone collections for SJO-91 and SAC-29 are stored in archive boxes in the Institute of Archaeology and Cultural Studies Laboratory of California State University, Sacramento. These groups were chosen because they contain the greatest possible number of individuals available from the Early Middle and Late Middle Horizons. SJO-91, the Early Middle Horizon site, provided 31 individuals out of a total of 115 burials that were suitable (in a good state of preservation) for study. SAC-29, the Late Middle Horizon site, provided 15 individuals in a good state of preservation and seven individuals in a state of broken bone remnants, out of a total of approximately 200 burials. Each of these individuals, from both groups, were pulled from storage, the contents thoroughly studied for age and sex confirmation, and then for pathologies and traumas. Where pathologies or traumas were found photographs were taken of the areas involved and their burial number and pathology or trauma noted.

Forms, provided by Dr. Samantha Hens and Standards for Data Collection
from Human Skeletal Remains, edited by Buikstra and Ubelaker, were used for recordation. These findings were then recorded on spreadsheets that noted all burial sites from the two populations, age, sex, traumas, anomalies, and pathologies (See Table 1).

**Data Analysis**

Multiple 2x2 analyses of variance were conducted with geographical group (San Joaquin, consisting of 15 females and 16 males, and Sacramento, consisting of 9 females and 13 males) and gender of each population as the two independent variables. Each individual pathology and individual trauma, the total occurrences of trauma and pathology, and mean age at death made up the 23 dependent variables. Because multiple univariate analyses were used to test for significance, a corrected alpha level of .002 (.05 / 23) was used to determine significance, with results between .002 and .05 interpreted as trends. The results of all analyses are shown in Tables 2 through 7.

Geographical group, gender, mean age at death, and trauma and pathology anomalies were analyzed for two groups of Native American Indians with group SJO-91 N = 31 comprised of 16 males and 15 females, and group SAC-29 N = 22 comprised of 13 males and 9 females.

**Results**

Although no interaction between geographical group and gender was noted in any of the analyses, significant main effects and trends were noted. There was a significant main effect of geographical group on total pathology, $F(1,49) = 12.16$, $p = .001$, with the San Joaquin group having greater total pathology (M = 2.23, SD = 1.67) than the Sacramento group (M = .86, SD = 1.04).

There were several trends noted with regard to the independent variables of geographical group and gender. One trend regarding gender and mean age at death $F(1,49) = 8.08$, $p = .007$, suggests that females in both groups (M = 43.87, SD = 12.25) tended to outlive their male counterparts (M = 34.47, SD = 9.34). Another trend regarding gender and weight bearing thickening $F(1,49) = 4.09$, $p = .049$ suggests that males tended to develop traumatic weight bearing bone thickening (M = .24, SD = .44) more often than did their female counterparts (M = .04, SD = .20). Trauma totals also revealed a trend toward gender, $F(1,49) = 4.76$, $p = .034$, with males suffering more overall trauma (M = .69, SD = .76) than their female counterparts (M = .25, SD = .53).

Trends were noted regarding geographical group and osteoarthritis, $F(1,49) = 6.007$, $p = .018$ indicating that the San Joaquin group may have
suffered more incidents of osteoarthritis (M = .68, SD = .48) than the Sacramento group (M = .36, SD = .49). Additionally, a trend regarding geographical group and gum abscess $F(1,49) = 4.739$, $p = .034$ suggests that the San Joaquin group (M = .35, SD = .49) also suffered more incidents of gum abscess than the Sacramento group (M = .09, SD = .29).

**Conclusion**

With everything taken into account, both of these populations were fully able to fight off infectious diseases indicating a state of relatively good health. This is apparent through the several incidences of reformed bone where an infectious disease had been present.

The mean age at death across both groups was 38.72 years. Although this is not a long life span, consideration must be given to the simple fact that they lived 1,200 to 2,900 years ago under conditions in no way comparable to present day life spans. The women in both groups tended to outlive the men by as much as five to nine years. The women from SJO-91 lived to approximately 47 years of age and those from SAC-29 to around 39 years. The men from SJO-91 lived to approximately 35 years and those from SAC-29 died younger somewhere around 33 years (see Figure 1).

Both groups, particularly the SJO-91 population, were fairly tall and robust. The minimum male height is 164.66 centimeters, with the maximum at 190.82 centimeters and a mean of 171.57 centimeters. The female range extended from a minimum of 157.76 centimeters to a maximum of 171.69 centimeters, with a mean of 165.14 centimeters. Stature figures were calculated in several different ways. Those with no range were computer-generated and based on femur length only. Those measurements with a range were calculated from the most accurate bones available. In other words, if the femur was not present, the tibia was the next preferred bone, and so on (e.g., CA-SJO-91 Collection Catalog Verification Report, 1994).

Weight bearing bone thickening, called enthesopathy, is an anomaly peculiar to these groups. In most cases, it involved the clavicular ligamentous attachment that was observed as being very pronounced at the sternal end. The cause for this is occupational stresses to the ligament where it attaches to the costal tuberosity of the clavicle (e.g., CA-SJO-91 Collection Catalog Verification Report, 1994). When this weight bearing bone thickening was compared to gender, the results indicated that this anomaly was greater in the male populations from both groups (see Figure 2). It can be speculated that this anomaly occurred due to the greater strength required both for hunting and warfare (possibly in drawing a bow and throwing a spear). There is also more recent speculation that the
presence of enthesopathies has a relationship to injuries and the bone and ligament healing processes and also to aging (e.g., Jurmain, 1999).

Osteoarthritis is a common disease found throughout the world in modern times, and was certainly present in prehistoric times. Both men and women from SJO-91 had this disease in greater numbers than those from SAC-29. The men from both groups, however, tended to have greater instances of osteoarthritis than the women. This may have been due to climatic changes over time as well as biomechanical stresses on their bodies (See Figure 3). Although osteoarthritis is normally subscribed to the aging process where it appears that, with age (and/or biomechanical stress), osteoarthritis becomes increasingly common and more severe. The limitation of such an approach is the failure to appreciate the considerable capabilities of joints, including bone and articular cartilage, for repair (e.g., Jurmain, 1999).

Trauma totals indicate the males from both groups suffered greater trauma than did the females. Men from the SJO-91 population appear to have suffered more frequent trauma than did the men from SAC-29 (See Figure 4). This was due, for the most part, to greater incidences of conflict with the SJO-91 population (a greater number of projectile points were found among this group). The lack of equal trauma to the women from both groups, as compared to the men, indicates a sexual division of labor not conducive to armed conflict or hunting.

Of the two groups, the males from SJO-91 suffered greater pathologies than did those from SAC-29, while the females from both groups suffered fewer (See Figure 5). Again, for the most part, the sexual division of labor would appear to be more closely connected to the encampment for the women than for the men, therefore, possibly fewer incidences for disease.

All members of the SJO-91 group appear to have suffered from a greater number of abscesses than those from SAC-29. This has a direct bearing on the amount of acorn processing conducted by one group over that of the other. The SAC-29 group, as noted previously, appears to have had less reliance on the acorn as a staple food source.

In summation, it would appear that, regardless of the geographical location of the groups, women tended to outlive men in their respective populations. Males had more weight bearing bone thickening and more traumatic anomalies overall than their female counterparts. Members of the SJO-91 population suffered more osteoarthritis, abscessing, and more total pathological anomalies during their lives than members of the SAC-29 population, regardless of their gender.
The research question, for the most part, has been answered in that significant main effects and trends were present. The pathologies and traumas evident at the time of death were duly noted and recorded, and the age and sex of both populations were either affirmed, from prior research, or updated through this research. The question of how these pathologies and traumas correlated to the subsistence strategies and sexual divisions of labor within and between these two populations was not significant. Future studies with greater populations, however, may be able to find significance. Finally, deductions were made with regard to the groups' environmental processes and lifestyles. The remaining portion of the question as to what deductions could be made with regard to religious practices has to remain unanswered. Other than burial positions in both populations, and some evidence of red ochre included in the SAC-29 burials, there was little or no evidence presented with which to answer this portion of the question.

It must be noted, however, that future studies of this or similar realms of inquiry should take the following criteria into consideration:

1. The research would be better supported if the scope of study were to be narrowed to just one or two specific pathologies or traumas.
2. The application of the results should be applied with caution and awareness of research bias.
3. Additional time application for greater in-depth study of skeletal material should be accounted for.

During the course of this research several interesting points were noted for future study: There is little extant research on the subject of entheseopathies, a subject that should be addressed before the ability to read the bones in this area becomes more than speculative. The SJO-91 group in due to be returned for burial in the near future. It was also noted that the great reliance on osteoarthritis as age-related and a progressively incurable pathology might not necessarily be true. There is evidence to support the possibility of bone reconstruction by the living body. Both of these areas, if carried forward into newer realms of inquiry, will add a great deal to the store of knowledge necessary to "read the bones."

In moments of pure speculation as I looked at these long-deceased individuals, I realized that it was truly possible to read into the bones, at least a portion of, the lifetime of those who lived with them. It is so very easy to let your mind wander to see, in the inclusion of a fetus with a female burial, a death caused by childbirth; an arrowhead in a man's back indicating he was running away when he was shot; and tooth loss so great as to leave little or no means by which to chew food, but living on because someone cared enough as you got older and more infirm - to care for your needs.
Can we tell, by examining the bones, a tale of the life of these individuals? Yes we can, at least to some degree - and the stories we learn as to how these individuals lived and died, their diet, health, and overall lifestyles are truly a reading from the bones that tell of the lifetime of those who lived with them.
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Communicating the Concept of College To Mexican American Students and Its Impact on Their Final Decision to Attend College

Janeth Serrano

Abstract

This study looks at the many factors that influence Mexican American students to attend college. This study seeks to determine if, as established in a study by Gauvain & Hurtado (1997), parents, counselors or teachers are still the primary sources of information regarding college. The population was Mexican American students who were participants in the College Assistance Migrant Program at California State University, Sacramento. Using a questionnaire and in depth interviews with 10 participants, this study seeks to identify influencing factors that lead Mexican Americans to attend college. Influencing factors include level of parental education, availability of information about college, methods of financing their college education, obstacles encountered once in college and the main reason for having attended college.

Introduction

Predictions indicate that, with the current population growth, the total number of students enrolled in California's colleges will reach 2.2 million by 2007 (Dortch, 1997). As the number of Mexican American college-age students has grown in both California and the United States, many scholars have begun to look at the percentage of these same students who opt to obtain a higher education. A recent study found that out of 13.7% of Mexican students who are college-age, only 4.2% obtain a bachelor degree (Perna, 2000). The number of Mexican American students who choose to attend college will have an impact in this country as a whole. In the United States, upward financial mobility is sometimes limited, or characterized by, the level of education obtained by the individual. This being said, Mexican American students are still underrepresented in colleges compared to their college-age population. The number of Mexican American students who attend college is far below what it should be despite many efforts made by special programs - such as the College Assistance Migrant Program (CAMP), federal financial aid and Educational Opportunity Program (EOP) - and an increased awareness of the specific needs of individuals
from this cultural background.

Mexican Americans make up about sixty percent of what scholars like to refer to as Hispanics. According to Richard Verdugo, "the term 'Hispanic' refers to persons whose ancestry has origins in a Spanish-speaking country." For the purposes of this study, however, this researcher will refer to the chosen population as "Mexican Americans." The reason for doing this is because the students selected for this study are of Mexican descent by birth or culture. Even though some of the students might have been born in Mexico, they have lived in the United States long enough to be considered Americans. Also, for those born in the United States, it would be a misrepresentation to negate their culture of origin by not referring to them as "Mexican Americans." Simply put, when referring to either the students who were born in Mexico or in the United States, this researcher chooses to simply refer to them as "Mexican Americans." Note that current research on this topic usually refers to this population as either "Hispanic" or "Latino."

The changing demographics of Hispanic students suggest that despite the fact that their college enrollment has increased (Verdugo, 1995), "Hispanics continue to be underrepresented among both undergraduates (8%) and bachelor degree recipients (4.2%), relative to their college-age population (13.7%)" (Perna, 2000). Despite all of the numerical data, most of the studies done regarding Hispanic students are vague in that they do not ask why students choose to attend college; rather, they look at different variables that keep students from obtaining a college education. Some of the variables that affect college attendance among Mexican American students are the availability of financial aid, level of acculturation, parent's educational background, and the amount of time spent on college planning.

Despite the different variables that have been studied, there seems to be an area unexplored by many scholars. Very few studies have focused on the information available to Mexican American students regarding college. Although there is a lot of information about what keeps many Mexican American students from attaining a college education there is very little information about those who have already attended college. In short, most studies conducted regarding Mexican American students focus on the obstacles and not the opportunities. Although it is important to look at the reasons why students choose not to attend college, it is just as important to look at the reasons why they do choose to obtain a college education. By looking at the availability of college information to this population, we can gain a better sense of what needs to be done to increase the number of Mexican American students attending college.
Review of Literature

One of the most recent variables examined in research of Mexican American students is the level of acculturation, and its effect on college attendance. "The relation between acculturation and college planning is a topic that is largely ignored in research on academic achievement among Latinos" (Gauvain & Hurtado, 1997). Gauvain and Hurtado specifically looked at the planning behaviors of Mexican American and of European-American youth. When researching the planning behaviors of these two groups, Gauvain and Hurtado also decided to determine whether acculturation had an impact on how these students planned for college. The population chosen for this study was that of junior and senior high school students "who resided in a lower middle-class community in southern California" (Gauvain & Hurtado, 1997).

A college planning survey, acculturation rating scale and an after-high school survey were used. In essence, the researchers followed these students from high school to college. The overall results tended to show that, although acculturation did not play a role in college planning behaviors, it did play a role in determining whether or not the students attended college. One important finding that Gauvain and Hurtado identified was that college is a goal that most students strive for, yet the level of acculturation is a deciding factor in whether these students end up going to college or not. "Apparently, the desire to go to college and even engaging in some planning-relevant behaviors regarding college are not sufficient for helping Mexican American youth attain this goal" (Gauvain & Hurtado, 1997).

Although most of the information presented in Gauvain and Hurtado's study was very well thought out, this researcher found some weaknesses. No follow-up studies were done on the students who had decided not to attend college. Furthermore, although Gauvain & Hurtado did identify parental education as a factor in the college attendance of Mexican Americans students, they did not explore this factor deeply. For those students whose parents had a low level of education, Gauvain and Hurtado suggested more information be given to them in order to break the cycle of low college attendance. Finally, "the opportunities that are fostering their attendance" is another area that they mentioned needing more research for this population (Gauvain & Hurtado, 1997).

A study presented by the Journal of Higher Education, in December of 1995, suggests that one of the ways in which Hispanic students can be encouraged to enter and stay in college is through the use of role models. Specifically, Verdugo looked at Hispanic faculty as role models for Hispanic
students.

"The belief is that, if Hispanic students are able to see Hispanics in these kind of positions, it will not only motivate them to remain in school and achieve academically, but will also provide them with a group that is a natural sounding board for the many problems facing Hispanic students" (Verdugo, 1995).

By asking different Hispanic faculty whether they had to deal with many barriers, Verdugo planned to find out whether the achievement of higher education was perceived as attainable or not. Of those surveyed, the majority noted prejudice as one of the barriers that they had to deal with. Overall, Verdugo found that having Hispanic professors at their college institutions made current Hispanic students more likely to want to continue to be enrolled at that particular college. He also notes that "Hispanic role models can be very important."

This researcher found Verdugo's point of looking at Hispanic faculty as a predictor of college attendance by Hispanic students very noteworthy; however, there was not a strong correlation between the two. In sum, more research needs to be done in order to test whether Hispanic faculty members prove actual role models for Hispanic students. Additionally, there needs to be further research done to test whether or not Hispanic students choose to attend a college simply because of the presence of Hispanic faculty.

A study conducted by Hunziker (1987), about special admission students at the University of California, Davis, concluded that, out of those Hispanic students who were admitted through the special admission process, "about one in three Hispanic students graduated." Despite the special admission process - which lowers the standards of admission requirements in order to make it possible for targeted groups of students to attend college - and the growing number of minority students enrolled in college: "Hispanics still will be 550,000 seats short of a share of college seats equivalent to their share of the [college-age] population" (Manzo, 2000).

The impact that special admission processes have had on the admission of Mexican American students into colleges or universities, was demonstrated when "SP-1 (eliminating racial/ethnic preferences) was passed by the University California Regents in 1995" (TRPI, 2000). This decision (SP-1) had "undesirable results" throughout the whole University of California (UC) system. According to a policy brief released by the Tomas Rivera Policy Institute in February of 2000: "since the new standards were implemented, there has been a 39% increase in the rejection
of Latino freshman applicants" (TRPI, 2000). A study conducted by the Institute looked at the acceptance rates of Latinos, African Americans, and Whites at UC Berkeley, UCLA and UC San Diego over a three-year period (1997-1999). The study found that, in many cases, the number of Latino students applying to these institutions increased each year, while the number of these same students who were actually accepted decreased each year. In other words, the rejection rate of Latino students applying to UC Berkeley, UCLA and UC San Diego rose to 39%.

Another article, by Anneliese M Bruner, suggests that the number of Hispanic students obtaining a higher education is growing. Bruner points out that "minority graduate education plays a critical role in the continuing vitality of the U.S. economy and its educational system." Bruner also states the importance of higher education in achieving financial success. In addition, Bruner also suggests that the federal government must play a role in increasing graduate education obtained by minorities. Bruner's point makes sense. If we plan to live in a country that will be economically successful in times to come, we must look to the current population to carry us forward. And, as the "Hispanic population soars in the U.S." (Westphal, 2001), we are faced with a population that needs to be educated. If anything, Bruner establishes the reasons why we should focus on education as a basis for future economic well being.

In the study "Differences in the Decision to Attend College Among African Americans, Hispanics, and Whites," Perna tries to look at the reasons behind a student's decision to attend college. In her study, Perna states that "although more Hispanics are attending college and receiving degrees than ever before, Hispanics continue to be underrepresented among both undergraduates and bachelor degree recipients." Although the number of Hispanic students in colleges tends to be low, Perna also found that financial aid did not have "a positive effect on the probability of attending college," despite the fact that Hispanics were more likely to receive grants.

On average, Perna found that Hispanic students' parents were less likely to have obtained a higher education, and, furthermore, had a lower percentage of parental involvement in their children's education. Perna's findings are important because they lay the groundwork for the predictors of college attendance. More specifically, her study focuses on the different aspects that determine college attendance by Hispanic students. A very important result that came about in this study was that "financial aid alone is not sufficient to increase college access."
Purpose and Objectives

Previous studies have focused on the factors that keep Mexican American students from obtaining a higher education. This study, however, was based on looking at the factors that have helped Mexican American students make the decision to attend college. Specifically, this researcher wanted to look at how the concept of college was communicated to these students. In Gauvain and Hurtado's study, Mexican American students identified primary sources of information as being the major contributors of college attendance. They found that Mexican American students were more likely to attend college if they had heard about it from primary sources, such as their parents, a teacher, counselor, or their family.

Part of this study's purpose was to find out whether the findings of Gauvain and Hurtado's study are still true among Mexican American students. Furthermore, this study sought to identify the many reasons that Mexican American students have for attending college. By looking at the reasons behind the choice to attend college, this researcher endeavored to gain a better understanding of why Mexican American students have chosen to attend college in the first place. Overall, this researcher wanted to determine if there was a correlation between the sources that communicate the concept of college to Mexican American students and their motivation to attend college; and the sources of information regarding college were the same motivators for these students to attend college.

By testing whether primary sources (as identified by Gauvain and Hurtado) have an impact on the choice to attend college or not, this researcher was able to then focus on the contributing factors that aided in college attendance by Mexican American students.

This study was based on trying to identify the sources that Mexican American students have for obtaining information about college. This is important because if we know identify the best sources of information for these students, then these sources could become the focus of future studies to increase the number of Mexican American students who receive information about college. Also, by identifying the sources named as being the most influential, future research can place more emphasis on them to ensure that they work toward increasing the number of Mexican American college students.

The scope of this study was limited because of the time constraints. As it was a short-term study, there were many things that could not be accomplished in a period of two months. One shortcoming of the time limitations was that although this researcher would be able to survey Mexican American college students, there would not be any follow-up
study done to find out how many undergraduate students received their bachelor degrees. Despite this, this researcher still believes that the information obtained as a result of this study is important because getting Mexican American students to attend college is a worthwhile challenge. Since the time allotted for the study was short, it affected the type of methodology this researcher used. And, because time was such an important factor, this researcher decided to supplement the survey with the personal interviews of 10 participants.

Through interviews, this researcher was able to have a better insight into the data obtained from the survey. Interviews also allowed this researcher the opportunity to ask follow-up questions that were not possible in the survey. For example, if a participant's response was unclear, clarification could be obtained. The interview process also allowed this researcher to understand the true motivation for these students to attend college. Interviewing students also allowed for understanding regarding how communication about college affects the decision of Mexican American students to attend college.

Another limitation was the type of students who were available to participate in the survey. Because time was a critical factor, this researcher decided to work only with students who were or had already attended college. Specifically, the students obtained for the study were Mexican American students who had been part of the California State University, Sacramento (CSUS) College Assistance Migrant Program (CAMP). The program is designed to "help students from migrant and seasonal farmworker backgrounds succeed in college" (Yanez, 2001). A seasonal farmworker is defined as "someone who has worked in farmwork for at least 75 days or on a seasonal (not-year-round) basis" (Yanez, 2001). The CAMP program is set up to help students with the transition from high school to college by providing services throughout their first year in college.

Since the CAMP program is available only on six college campuses nationwide, and works with a specific group of students, the results from this study cannot be applied to the general population. Rather, this research is mostly introductory so that future areas of research on Mexican American students can be established.

Although those in the identified population who are currently not attending college are important, it would have been much more difficult and time-consuming to identify these individuals and attempt to study them. Also, just because these students may not currently be enrolled in a college or university, it did not mean that they might not be so in the future.
So, because of time limitations, this researcher chose to work with the population of Mexican American students at CSUS.

**Research Question**

The main purpose of this project was to find out whether or not the concept of college is communicated to Mexican American students more significantly through primary sources. And, if it was communicated to them through primary sources, were those the deciding factors that lead to the decision for that particular student to attend college? This study's hypothesis was that - although information about college is given to Mexican American students through primary sources, such as teachers and counselors - parents play a larger role in whether these students decide to attend college or not.

In sum, Mexican American students continue to grow in numbers but are still underrepresented when it comes to college attendance. This disturbing trend must be a wake-up alarm for those who see the future of this country in our children. The economic well-being of the United States depends on the education that the current population receives. If there is a part of that population that does not have access to information about college, we must work so that access to that information is available to them.

**Methodology**

The availability of information about college to Mexican American students is important because it can be the deciding factor that either leads students to attend college or not. The central motivation in conducting this research is to help increase the number of Mexican American students who ultimately decide to go to college. This can be accomplished by identifying the important channels through which communication about college is disseminated to Mexican American students. Identifying the sources of communication that are the most influential in getting Mexican American students to attend college was both a crucial and difficult process. Yet, this was very important because "Though the Hispanic population continues to grow, its educational achievement lags behind that of the United States" (U.S., 2000).

Besides establishing the need for this research, the methodology used to gather information was crucial to obtaining well-informed results. After speaking with Mr. Marcos Sanchez (the Director of the CAMP program) during the first week of July, this researcher was allowed to modify and use the survey he designed for his dissertation. This researcher made some revisions to reflect the information this study was intended to identify.
Along with the revised survey, a cover letter was sent containing details about the research and the purpose of the study. See Appendix A for a sample of the survey instrument. With help from Connie Ayala, the CAMP retention counselor, this researcher was also able to obtain a list of the first two hundred CAMP alumnae from the program's database. A copy of the survey was sent to the two hundred individuals, along with a self-addressed stamped envelope.

A couple of days later, an e-mail was sent to the same CAMP alumnae asking for volunteers to do an interview. These volunteers were then chosen and paid twenty dollars for their time. The recorded interviews were between thirty- to forty-five minutes in length. Each interview provided information that was not covered in the survey. For example, the interviews allowed this researcher to ask about where the student had first heard about the concept of college, and who was the person who helped them through the admissions process.

The main goal of each interview was to find out why certain sources were more influential than others were when it came to communicating the concept of college. This researcher expected to find that primary sources, such as parents, teachers, and counselors, had a bigger impact on the decision for these students to attend college. Most importantly, this researcher was able to determine whether or not Gauvain and Hurtado's study was validated. The interviews also enabled this researcher to have a better understanding of why these primary sources play such a big role in the decision-making process for Mexican American students.

Before beginning the study there were, of course, some variables that needed to be taken into account. The chosen population was Mexican American college students. The level of parental education is one variable that this researcher believes is a large factor in determining whether communication about college is taken into account. The education of Mexican parents tends to affect the level of education reached by their children. When a high level of education is not achieved, one can assume that the level of income for that individual is not the same as his or her educated counterpart. If Mexican parents have not obtained a high level of education, then we can conclude that their socioeconomic status is usually at a much lower level than of those who have obtained a higher education. The Mexican or Latino family is often very close knit, in fact, a 1994 survey done by Gonzales, Haro and Rodriguez of the University of California, and California State University Chicano/Latino Students found that:
It is important to note that the Latino family plays a key role in determining the successful matriculation and graduation of the Latino college student. Colleges and universities must recognize the role that the family plays in developing strategies to retain Latino students. (p. 8-9)

In 1982, the James Irvine Foundation also found that:
Although Hispanics perceive education as a key to social mobility, families of extremely limited financial means cannot afford to provide an environment that encourages students to pursue or complete education. In many cases, higher education is not seen as an option for young people, especially for women, approaching adulthood. For students, a strong sense of commitment to family and community frequently competes with academic responsibilities. Both men and women cited the need and desire to assist the family financially or to be at home during a time of family stress as reasons for dropping out or taking a break from school. (p. 8)

Another aspect that had to be taken into consideration was that gender might play a role in the sources that students identify as being more influential. The way this researcher controlled for gender was by separately analyzing the data collected from males and females. An additional variable that was taken into consideration was the availability of information in the student's particular high school. This factor was not tested due to a lack of time. The survey did, however, ask about the total number of students in the participant's high school graduating class. The assumption was that, if the students identified themselves as having attended a smaller high school, the availability of information would be greater based on the number of students served at the school.

Another variable considered was the economic background of the student. The economic background of the Mexican American student is a determinant of college attendance. And, in turn, this can affect the choices that this student makes in the future (i.e. college attendance). The survey addressed this problem by asking whether or not the students had worked in order to finance their college education. Also, because all the students were CAMP alumnae, this researcher knew that they had come from low-income families.

Finally, another variable that had to be considered was the birth order of the student. The student's place in the birth order of their families can affect the level of information received about college. For example, if a student is the fourth born child in his family, and his brothers or sisters have all attended college, he is more likely to know what college is and thus be influenced to attend college. Specifically, this researcher believes that more second- and third-born Mexican American students have been
exposed to the concept of college because their siblings have been in the U.S. for a longer period of time and thus have a higher propensity for hearing about the concept of college.

Gauvain and Hurtado's study allowed this researcher to come up with a hypothesis explaining why certain people are more influential than others are in the lives of Mexican American. This researcher knows from personal experience that, in the Mexican American culture, the family is seen as the central unit. Having a close-knit family is a large part of the Mexican culture. Because of the importance of family in this culture, this researcher expects to find one of the most important reasons why Mexican American students choose to attend college is, in a large part, affected by their family. As Gonzales, Haro and Rodriguez state:

For Latino students, their families are central to their lives, and the family shares the Latino student's educational experience. In other words, the experiences, emotions and decisions that a Latino college student makes are shared with her/his family. Likewise, the experiences of the family are shared with the college student.

Within the family unit, this study will likely find that parents have the highest amount of influence when it comes to Mexican American students choosing to attend college or not.

**Results/Findings**

The following is a discussion of the results and finding established from the survey and participant interviews.

**Survey Results/Findings**

Of the two hundred surveys mailed, a total of 39 responses were received within the two-week period following the initial mailing. Of those surveys received, twenty-seven were from females, and only twelve were returned from males. The ages of those surveyed ranged from 18-33. Of those students who responded, the size of their parent's household was between four and ten, with the majority stating that they came from a six-member household.

The results of the survey also indicated that fifteen out of the thirty-nine participants were first-born children, and, of those, only seven participants identified themselves as having siblings who had or were attending college. And, those students who identified as having siblings in college, the majority stated that they had two other siblings who had attended college, with only five reporting one sibling and six stating that three siblings had attended college. Also, the majority of those surveyed also reported being born in the United States (25 out of 39). For those
who identified themselves as being born outside this country, the total number of years that they had been in the United States was between 9-23.

When asked if they were bilingual, all participants, without exception, reported that they were. Furthermore, only one participant could not read Spanish; three stated that they could not write in Spanish; and all said they could speak Spanish fluently. This information proved important because, out of those surveyed, only two participants reported having problems with translation of the language when it came to naming a barrier they had encountered when pursuing their college education. Other barriers encountered when trying to pursue a college education included lack of familial support, time and academic preparation for college. The most common barrier, however, was financial instability. When asked about what factors had allowed these students to overcome barriers encountered while working to obtain a college education, the majority cited work, familial support and the desire to succeed as being the main reasons for pursuing their degree and overcoming any barriers.

The level of parental education from the sample of students surveyed was mostly elementary. Twenty-six out of the thirty-nine students listed their father’s education as being sixth grade or less, while twenty three of the students identified their Mother’s education as being sixth grade or less. Interestingly enough, the level of education achieved by both parents did not vary much, except that the only parent identified as having attended some college or vocational school was always the mother.

As for extra-curricular activity participation during high school, participants reported that they would often (16); seldom (16); or never (7) participate. When asked whether their parents attended meetings while they were in high school, 14 reported that their parents never attended meetings, 17 reported that they seldom attended, and eight reported that their parents attended meetings often. In the high school they attended, only three participants reported that they had counselors who were very encouraging about them attending college. Fifteen stated that their high school counselors were somewhat encouraging, and nine stated that their high school counselors were not encouraging at all. One of the students reported that her high school counselor had tried to dissuade her from attending college, suggesting instead that she join the Army because the counselor believed that she did not have the skills required to succeed in college.

The next question was aimed at testing the level of awareness participants had about the variety of college opportunities available to them while still in high school. Participants could either report that they were
very aware, somewhat aware or not aware. A follow-up question then asked whether or not they would have still attended CSUS had they known about all of the other college opportunities available to them (i.e. the University of California system, other California State universities, private universities, etc.). Nine reported being very aware, 20 were somewhat aware and 10 reported that they were not aware at all of the other college opportunities available to them. Furthermore, only four of those who reported that they were not aware at all indicated that they would not have chosen CSUS given the knowledge about other universities. The majority (24) reported that they would have still chosen to attend CSUS. The majority (21) of the students came from small high schools (less than 200 students).

The next set of questions was aimed at college preparation via academic courses. The students were asked whether they had taken courses in the following areas: college preparatory, vocational education, business or other preparatory classes. If they had taken classes in any of these areas, they were then asked to state how many years of instruction they had received in each area. The majority of students who had taken any type of specialty classes identified college preparatory courses as being the top choice of attendance. Very few students stated that they had taken other specialty courses, and if they had, it was only for a year or two.

When asked to check off the reasons they had for attending CSUS, the most popular responses were proximity to home and financial aid. The majority of the students reported being part of a special program as a major reason for attending college. However, this is not significant because the entire population used for this study came from CAMP. Furthermore, when asked about how they were financing their college education, the majority of participants reported state/federal grants, loans and part-time work. Only 11 participants reported working full-time, which indicates that the majority of participants worked part-time, if they worked at all (four participants reported that they did not work at all).

In-class interaction with professors was found to be helpful or somewhat helpful for the majority. As for out-of-class interaction with professors, only three students reported it as not helpful at all. For those students who sought out-of-class interaction with their professors, face-to-face meetings were reported as the most comfortable method for them to contact their professors, with e-mail being the second most popular of the choices. Very few students cited voicemail as a preferred method of contacting their professors outside of class.

Only six out of those surveyed stated that they had taken more than
two semesters off from school since starting their college education. The reasons given for taking time off from school were financial, medical, family or personal, with financial reasons being the most common. Reasons given for wanting to pursue an education were for financial mobility and personal satisfaction.

On average, the majority of the students stated that it had taken or would take five- to six-years to graduate with a bachelor degree. And, 64% of those surveyed identified that they planned to attend graduate school. Yet, the most interesting part of the survey responses came from the last question, which asked students to name the person or persons that had influenced them the most to attend college. Without fail, the majority of the students reported that either parents or other family members were the main influence for them to attend college. The only other sources identified by students as being influential in their choice to attend college were high school teachers or counselors.

*Interview Results/Findings*

In all of the interviews conducted, the person identified as being the source of information about college was very different from the person who had motivated respondents to attend college. The majority of those interviewed identified teachers as the main source for information regarding college. Teachers were identified as being the first person to ever talk to them about college. Yet when it came to the actual motivation, there was always someone else identified as being the main reason for their choice to attend college. For instance, one of the students stated that she had heard about college for the first time from her high school English teacher, but the actual motivators had always been her parents. Even though her parents did not have a high level of education, they always conveyed to her the importance of obtaining a higher education. When it came time to apply for college, her parents could not assist her with the process (being that they had not gone to college themselves); therefore a counselor was the one who assisted her with the application process. For most of the participants, this tended to be the case. The source of information regarding college (teacher, counselor, or sibling) was very often not the same person as the main influence in their final decision to attend college. In essence, someone had planted the seed of the concept of college, but it was through the help of different people that the participant was then able to attend college.

The results also confirm that birth order had a lot to do with who the main influence was, as well as the source of the information about college. For those participants who had siblings who had attended college prior to
them, the availability of information about college was much more prevalent because they heard about it firsthand from their sibling(s). And, although they stated that the sibling had not been the single motivator for their own desire to attend college, they did have an effect on where the participant attended college. In most of the interviews, the students who had siblings in college ended up attending the same college as their siblings had, and their main reason for doing so was a sense of familiarity.

Also, this study found that the reason for attending college changed depending on the participant's place in his/her family birth order. All of those interviewed who were first-born stated that their main motivation for having attended college was to provide a positive role model to their younger siblings. Of those that had had an older sibling attend college, the majority stated that they would have been less likely to attend college if their older sibling had not attended college. The main reason cited for this was the difficulty of going through the admissions process without the help of a sibling.

Another very important finding from the interviews was about how much information was readily available from the counseling staff in each of the participant's high schools. Overall, all of the students stated that, although they were aware that their counselors were possible sources of information about college, information was not made readily available unless the students themselves sought it. For example, one of the students reported that the only reason she learned about financial aid was because a teacher of hers had suggested she ask her high school counselor. The counselor, who was aware that she was from a low-income family and that she wanted to attend college, was not very forthcoming with the information until she asked him specifically about financial aid.

There seemed to be a pattern that was evident to this researcher after she had completed all of the interviews. Someone (parents or teachers) had been the source of the information about college in each of the lives of the students from the time that they were younger. The participants then decided that college was an option when someone (sometimes the same person who was identified as the source of information) encouraged them to pursue it as a possibility. And, finally, someone else usually helped with the admission process. In sum, findings from the interviews suggest that it is not just one person who aids in the college attendance of Mexican American students, but rather a group of people working together (whether they are aware of it or not).
Recommendations

From the interviews and survey results, this researcher has determined that there are many areas that need further study. The first of those being that this research needs to expand to include all students who come from low-income households. In the future, it would be beneficial to know if other students who come from low-income households experience similar barriers when trying to obtain a college degree.

Another area that needs further research is the level of college information available to all students prior to attending high school. This is important because if students are not aware of the courses they need to take in order to make a smooth transition into college, then it becomes very difficult for the student to be prepared, and, in some cases, to even be accepted into college. There also needs to be more research done on the amount of information given to teachers and counselors regarding college, and see whether or not this makes a difference in how many students opt to pursue a higher education.

Although the interviews revealed that there were several people involved in helping encourage Mexican American students to attend college, there needs to be further research done on the amount of communication that is taking place between the teachers, counselors and parents. This is a crucial factor because parents were found to be the main motivators for Mexican American students. If we can work to open the channels of communication between the parents and school staff (counselors and teachers), there might then be a better chance for students to gain exposure to the concept of college, and to learn about the requirements they will need to meet in order to be ready to pursue a college education.

Finally, when interviewing the students, there seemed to be a disparity of perceptions about the amount that it would cost to attend college. Most of the students reported perceiving the cost of college as being unaffordable for them. Because of a lack of information, they believed that college was financially inaccessible, partly because the only colleges that they had heard about were mainly Ivy League universities, which can cost hundreds of thousands of dollars to attend. Therefore, there also needs to be further research done to find out whether or not students understand the differences between the type of universities, and their respective costs.
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Narrative Mediation: A Communication-Based Approach to Problem Solving
Toni L. Behl

Abstract
Narrative mediation is a new approach to the practice of conflict resolution. It is a blending of traditional methods of mediation with the narrative theory of communication. A unique feature of narrative mediation is the concept of dissolving the conflict situation by externalizing the problem. Externalizing the problem is the first step in rewriting the conflict story through changed perceptions of the involved parties.

Narrative mediation is a departure from accepted methods in the field of mediation (Winslade, 2001). This departure from accepted methods and the newness of the concept of narrative mediation limits the areas of research. This study explores the emergence of the assumptions of narrative mediation from a communications perspective, and then seeks to identify the acquisition of new knowledge by the practitioners in the field of conflict resolution.

Introduction
The realization that conflict is inevitable lends creditability to the study of conflict resolution. From a communications viewpoint, a lack of communication skills can lead to conflict through a simple misunderstanding of words spoken. Thus, the need in our society for new approaches to resolving conflict within our homes and communities is great. In a conflict situation, the voice of the individual is often repressed and the problem has a way of saturating the mind and entangling one's freedom of thought. Narrative mediation changes the individual's perspective on the problem through a storied experience.

The concept of peace in one's family, community, and country creates common ground for learning about the various approaches to mediation and/or conflict resolution. A new approach to conflict resolution emerges when the framework of these problem-solving approaches is woven into communication theories. By externalizing a problem through storied experience, the narrative approach to mediation offers a refreshing communications-based approach to conflict resolution. This approach separates the person(s) from the problem while creating an alternate story using the individual's knowledge and power of his or her own life experience.
There is a broad base of literature on a variety of mediation approaches and communication theories. This wide range of writing illustrates that "there is an enormous interest in finding peaceful means to resolving human conflict" (Winslade and Monk, 2000, p. ix). However, the area of narrative mediation is relatively new so its exploration requires a survey of literature from various fields of study. The scope of this paper will review literature from the fields of mediation, conflict resolution, communication concepts, mediation as therapy, and narrative mediation.

**Review of Literature**

Mediation has emerged out of a growing need to resolve interpersonal, family, and community problems by means other than our legal system. Mediation is defined as the intervention of a third party who assists people in making informed decisions in order to resolve a conflict.

A classic model of mediation is found in Getting to Yes: Negotiating Agreement Without Giving In, Fisher, Ury (1981). This model begins with the basic assumption that

"Negotiation is a fact of life" (p. xi). This work represents one of the first books about dealing with the emergence of mediation as a discipline. Fisher and Ury introduce a framework for a universal model of mediation that they call "The Method of Principled Negotiation." This model includes a neutral third party whose function is to separate the people from the problem. This method is based on a problem-solving, interest-based approach for resolving conflicts. Fisher and Ury provide a "one-text type" of strategy. This model of mediation is useful for the professional mediator or the lay person who wishes to enter negotiations and/or gain a mutually acceptable agreement by focusing on the merit of the issue (p. xii).

Nearly twenty years later, William Ury (1999) goes a step further than the interest-based mediation model. Ury places an anthropological (cultural/community) aspect on the previous model of mediating conflict. This model proposes "the third side" (p. 7), which includes the surrounding community as a "single interacting and interdependent" agency (p. xiii). Thus, the community serves as a stabilizing factor, a container, which controls any undue escalation of a conflict situation through mediation (p. 7). This model illustrates the various reasons why conflict escalates, and offers strategies to transform conflict episodes/situations through the roles assumed by "the third side" (p. 191). Ury proposes that, if the hope of peace is to be developed and maintained within our complex society, then we must learn about conflict resolution. Some of the basic tools of conflict resolution are collaboration and agreement, which are based on a
mutual interest of the individual person(s) or the community (p. 2).

The term conflict resolution encompasses various approaches, such as mediation, arbitration, interpersonal conflict resolution, intergroup conflict resolution, and various other methods, which are used to resolve conflicts.

Isenhart & Spangle (2000) address the growing need for collaborative methods in the approaches to conflict resolution. They present an overview of the various schools of thought on conflict resolution. Isenhart and Spangle write about the significance of practice and theory in resolving conflict saying "The perspective we use will affect the claims and conclusions we make about conflict. In addition, the theoretical perspective we use will influence our choice of strategy" (p. 3). The researchers write about the nature of conflict, saying that although there are "differences in theoretical perspectives, there are principles that they share in common" (p.10). These principles are: conflict is an inevitable consequence of social life; patterns of conflict behavior tend to perpetuate themselves; although conflict may appear chaotic, many elements can be understood; conflict is maintained by a series of moves and counter-moves; conflict affects the relationship of the parties involved. These principles illustrate that communication plays a central role in the management of conflict (p. 12).

Kressel (2000) also addresses the emergence of mediation as a formal practice "at all levels of society." He writes that the systematic research of mediation is lacking, but the practice of "mediation in its myriad forms" has increased the understanding and knowledge of "mediation as a social psychological process..." This efficacy of mediation as a practice, over the past two decades, shows the emergence of a superior form of conflict resolution within the interpersonal and group context. Mediation is a practical remedy for conflict because "it is based on a model of cooperative conflict, rather than the win-lose orientation...and because" the conflicting parties are directly involved in seeking an agreeable solution (p.522-23). Coleman (2000) describes the nature, theory, and future of mediation as a practice in resolving conflicts:

> For more than seventy years, scholars and practitioners in the field of conflict resolution have been searching for a better way..., a great deal of progress has been made toward understanding conflict and resolving it constructively...a great deal of work remains to be done...there are no simple answers to complex conflicts, and...we must all keep striving to find a better way. (p. 592)
Elements of Communication Concepts

John Kelly (1983) writes that "communication is sharing meaning [and] meaning is very interior to a person..." (p. 57). Kelly's observations capture a basic assumption about the concept of communication. Weaver (1990) elaborates on this assumption in saying that the principles of communication are inherent within the very nature of humanity (24). Weaver lists other principle assumptions of the communications process, which are identified by Dean Barnlund. Communication can be viewed as a process that is circular and complex. It is irreversible, unrepeatable, and transactional (p. 31-38). These principles, along with the interacting contexts (psychological, physical, social, cultural, and, temporal), illustrate the multidimensional elements involved in a single communication event. According to Weaver, these concepts are essential in understanding that communication acts to define, create, and shape the meaning of our lives. It is through the principles of communication that human beings create their own unique reality (p. 31).

In describing the multidimensional aspects of communication concepts, Weaver (1990) writes from the works of Dean C. Barnlund (1968), and John Stewart (1972 & 1986):

Our whole being is involved in communication, not just our body or mind, reason or emotion. Just as every message we send reveals, in a way, where we are, how we have developed, right up to that point, so should we look at the messages we receive from others as revealing the same things about them. From the various cues that others give us we construct a total picture of them. Whether or not the image is accurate does not matter as much as the fact that it is our configuration and we use it when we respond to them (p.35).

Weaver also writes that the act of creating meaning from the transactional viewpoint is considered an ongoing process that includes the past, present, and future. Again, Weaver interprets the works of John Stewart, saying:

The transactional viewpoint is essential to a clear understanding of interpersonal communication [and/or conflict resolution]. It suggests that when you engage another person through communication, you create a relationship that is totally unique, difficult to observe or describe because of its many facets, and, although changeable, likely to endure (and affect future encounters) forever. Relationships seldom cease to exist. They may change in how they are defined, but they do not end. (p. 38)
Narrative Perspective of Communication

Holligan (1988) writes of the emergence and influence of the narrative perspective in various disciplines. He writes that the scholars in studies of human communication have been especially drawn to narrative theory, because the narrative is communication. Holligan writes that "[the] narrative perspective holds that human beings are first and foremost storytellers, and that it is through shared stories that people give order to their personal experiences and shape collective social action" (p. 47).

Littlejohn (1999) credits Walter Fisher with "the most comprehensive narrative theory in the communication field," stating that "Fisher believes that human rationality in all its forms is based essentially on the narrative. Consequently, communication in all its form can be understood as narrative" (p.169). The uniqueness in narrative theory is that it builds on traditional rationality by adding the story or narrative of the individual as a form of common reasoning that, (as quoted from Walter Fisher) "is grounded and shaped by human personality." Narration is descriptive in its nature of describing the interaction of human communication. It does not dictate a prescribed course of action, as does traditional logical reasoning. The criteria for a narrative is that the story makes sense and rings true to a person's own knowledge of how things are - the story is believable (p.169). Littlejohn further clarifies the concept of narrative theory, in writing that the universality of the narrative approach is what makes it truly liberating and empowering. This approach liberates because the concept of story is innately born within the "reason, emotions, sensation, imagination, and values" of the human soul. Narration is empowering because it allows the voice of the individual to emerge through the knowledge born of the story (p. 169).

Fisher (1985) writes about the power of language in the form of logos or word. Fisher believes that the power of language is reflected through words or logos and that the original meaning given to logos was/is "story, reason, rationale, conception, discourse and /or thought." Therefore the words of language embody "all forms of human expression and communication from the beginning of time" (p. 75). The narrative paradigm offers a holistic perspective to human reasoning and communication by incorporating the knowledge of the ages through lived experience expressed in story (or the narrative). Fisher's viewpoint (1985) encompasses the knowledge of all disciplines, including religion, philosophy, science, and human reasoning, also known as "common sense" (p. 1-3).

In his article On Limiting the Narrative Paradigm, Rowland (1989)
writes that a valuable approach of the narrative paradigm is in its
type of application "as one among many modes of discourse and epistemic
instruments" (p.53). He concludes that the narrative paradigm is one of a
number of good communication theories. In this viewpoint, depending on
the scholarly perspective one takes, the narrative perspective can be
understood as a theory or as a communication paradigm.

Elements of Narrative Mediation

A.J. Lock (2000), writes of using the narrative perspective as a tool in
the therapeutic process, and describes a blending of the narrative
perspective with the mediation process. He writes that "Narrative ...
[mediation] is built on the notion that people are not the problem, but the
relation a person has to a set of resources for making sense of his/her
situation can position people 'in' problems" (p. 1). Narrative mediation
looks at the elements surrounding the problem, which include past and
present perceptions and future implications of the individual perceptions.
This aspect of applying narrative theory to mediation will inadvertently
incorporate the basic concepts of communication into the mediation
process.

Narrative mediation views conflict as the presence and/or
"performance of [an] oppressive, dominant story or knowledge" in a
person's life. This solution to conflict is constructed toward "opening
space for the authoring of alternative stories" (White and Epston 1990,
p.6).

The idea of "opening space" to create a new story is a unique
component of the narrative approach that is found in the works of Michael
White. This concept is further clarified through an understanding of
White's explanation of "externalizing the problem" (p.vii). The aspect of a
person having influence or power over the problem becomes plausible
when: "The distinction of the problem can be clearly separated from the
distinction of the person." This separation or "externalization" creates the
possibility to "carefully examine the dynamics and direction of the
interaction between the person and the problem" (p.viii). The possibility of
externalizing the problem is accomplished by looking at a person's self-
identity (agency), which is gained through one's life experience and then
separating it from the problem (viii). Separating the person's life experience
from the problem is the beginning of "opening space" for new perceptions
to emerge. These changed perceptions lay the foundation for a new storied
experience in the lives of the participants.
Theory in Practice

The emergence of mediation as a practice has raised some questions for Winslade, Monk, and Cotter (1998), about the fidelity of the problem-solving approach. These researchers address issues within the traditional models of conflict resolution, and apply a narrative approach to the process of mediation as a way of "stretching the boundaries of problem-solving" (p. 21). One of the assumptions of the problem-solving approach concerns the assumption that people are driven from self-satisfaction and need-based goals. This focus creates a search for solutions known as a collaborative or "win-win" type of problem-solving orientation.

According to Winslade, Monk, and Cotter:

This way of thinking emphasizes the pleasure-seeking principle as a driving force in human decision-making. It also directs us to focus on individual needs ahead of cultural, collective, or relational aspects of personhood. Conflict is understood to happen because individual needs are not being met (p. 22).

To contrast this approach, in A Narrative Approach to the Practice of Mediation, Winslade, Monk, and Cotter (1998), write of the narrative approach to mediation as a new field of practice:

Thinking in narrative terms is proving useful in a number of disciplines... Here, we seek to demonstrate the usefulness and the applicability of the ideas developed by Michael White and David Epston (among others) to the practice of mediation. Distinctions are drawn from the problem-solving approach with regard to both basic theoretical assumptions and method... (p. 21)

According to these researchers, the "collaborative problem-solving approach" to mediation defined by Fisher and Ury (1981) and "elaborated by other writers has contributed much to the growth of a field of professional mediation" (p. 21). The concept of the narrative approach constitutes a "stretching of the boundaries" of traditional mediation approaches. To illustrate this "stretching" Winslade, Monk, and Cotter give a seven-point summary of the features of the narrative approach to mediation. Some examples are:

- **Listening to the stories.** Traditional approaches to mediation begin with a hearing of the problem and establishing factual information, positions and interests of the parties involved. The narrative approach is interested in the timeline of the events leading to the conflict - the way in which the individuals create meaning to make sense of interconnected events - and the effect of the conflict on the lives of the individuals. Thus, the narrative
approach views the lived story as created from the implicit/explicit meanings and the persuasive discourses of a person's whole life experience.

- **Deconstructive inquiry.** Traditional mediation separates the people from the problem. The narrative approach tends to loosen the individual's attachment to the conflict 'by initiating a deconstructive inquiry into the background narratives that might be informing the meaning that the parties have been making in the story of the conflict.' An externalizing conversation is used in the deconstruction inquiry to speak of the problem as an eternal, separate entity, that 'does not internalize blame in either party.'

- **Searching for unique outcomes.** This aspect of the narrative approach continues from the deconstructive inquiry, and is a method of writing an alternate story through understanding and cooperation. The components of an alternate story are gleaned from looking for stories within the conflict story that will illustrate the qualities of the relationship, aside and separate from the conflict.

A unique feature of the narrative approach is that it works toward solving problems by dissolving them. The narrative approach seems to contain an inexplicable element of "truth" that results in resolving the problem through detachment. The dissolving and externalizing of the problem results in a new story or a re-storying of the conflict experience through changed perceptions of the individuals involved.

**Narrative Mediation**

The book *Narrative Mediation: A New Approach to Conflict Resolution* (Winslade and Monk, 2000), constitutes literature that breaks new ground on the emergence of narrative mediation as a discipline. This new discipline incorporates basic concepts of communication, which broadens the boundaries of traditional mediation approaches through the application of narrative theory. Narrative mediation views the mediator as an integral part of the mediation process. The narrative approach starts with a basic assumption that people "construct conflict from narrative descriptions of events" (p. xi). Through the narrative approach, new perspectives are brought forth from the storied experience of each individual's life.

The narrative approach takes into account the content and relational dimensions of relationships by concentrating on the development of "a relationship that is incompatible with conflict and that is built on stories of
understanding, respect, and collaboration" (p. xi). The narrative approach takes a systemic view of looking at, and addressing, the effects of the conflict story on the individuals, and upon the people connected to the individuals. For example, the wants, desires, and opinions of children involved in a custody dispute would be taken into account during the divorce mediation process (p. 9, 20-21). Narrative mediation also makes room for the understanding of social/cultural contexts to conflict. The complexity of the social context of human beings can be understood through the "cultural narratives that form around ethnicity, gender, class, education, and financial wealth" (p. xi). These cultural narratives open room for the concept of an individual's empowerment, which is gained through the knowledge of his/her language. These elements of the individual perspective create the storied experience of an individual's life, and result in giving narrative mediation an "outside-in" perspective to problems. Concerning this feature of narrative mediation, Winslade and Monk write:

At the risk of oversimplifying the mediation process, we compare narrative mediation with other approaches to mediation as an 'outside-in' phenomenon rather than as an 'inside-out' phenomenon. For example, the outside-in perspective looks at conflict as produced in the sociocultural milieu, where meanings are contested within the social fabric of community, while the inside-out perspective looks at conflict as created within the so-called natural desires, interests, and needs emanating from the individual. This approach is built on the assumption that the individual is unitary and context-independent. (p.xi).

Littlejohn (1999) gives further credibility to the "outside-in" approach proposed by Winslade and Monk: "The exploring of a person's storied experience 'empowers' by looking at the self as a 'performer' of knowledge through the power of story." The lived story includes interrelated cultural constructs of gender, expectations, values, beliefs, etc. (p. viii). Littlejohn further clarifies the concept of the narrative, as a lived experience of the individual, in writing that the universality of narrative is what makes it truly liberating and empowering. The narrative approach liberates because the concept of story is innately born within the "reason, emotions, sensation, imagination, and values" of the human soul. Narration is empowering - allowing the voice of the individual to emerge through knowledge born of his/her own unique story.

Theoretical Concerns

The application of communication concepts to conflict resolution, in the form of narrative mediation, is entering the theories of postmodernism
and social constructionalism (Personal correspondence with John Winslade, 2001). This is a departure from accepted clinical and structuralist theories. To avoid an assumed commonality with or carryover from paradigms (Winslade) this study will look at conflict from a process-orientated viewpoint. The prospect of looking at conflict resolution as a process means accepting that it occurs over time, and is built upon the change and growth of events within the dynamics of the relationships of human beings (Stockard and Lach, 1989). Thus, in this paper this researcher will examine current practices of conflict resolution to study current acquisition of knowledge toward a communications approach to problem solving.

**Purpose and Objectives**

This study is undertaken with the assumption that in any mediation setting the skilled practitioner uses different methods or tools, independently or combined, that result in bringing about a peaceful resolution. The purpose of this research is to:

- gain an overview of narrative mediation as an emerging practice
- illustrate the transformative nature of narrative theory when applied to traditional methods of mediation
- explore how current practitioners learn of new methods or new theories in conflict resolution

The objective of this paper is to illustrate the distinct elements of the narrative approach to mediation, and to highlight its uniqueness as an approach emerging from traditional mediation styles. For example, according to Winslade, Monk, and Cotter (1998), narrative mediation takes into consideration a person's whole life experience as created from implicit and explicit meaning (p. 38) that develops over the life span of the individual. In contrast, traditional mediation practices view conflict as a problem to be solved through the hearing of facts and the establishment of positional interests of the parties involved (p.38). To further clarify these distinctions, Winslade and Monk (2000) suggest that the narrative mediation process is an "outside-in approach" to phenomena, while the traditional viewpoints on mediation work from principles based on a "inside-out perspective (p.xi)."

**Hypothesis and Research Questions**

As a student of communication, this researcher is interested in the practical application of communication to real life. The application of narrative theory to traditional mediation creates a communication approach to conflict resolution that is applicable to the individual's real life experience. The objective of this study is exploratory in nature - to explore
the distinct elements of narrative mediation as an emerging practice, within the sphere of community and family mediation. The purpose of this study is to explore the acquisition of current knowledge by mediation practitioners in the field of conflict resolution. This research is based on two hypotheses:

1. Less than 20% of current mediation practitioners are familiar with the narrative approach to mediation.

2. A greater percentage of practitioners gain new knowledge first and foremost through books and/or professional journals.

Summary

During the past two decades, mediation has been emerging as a superior approach to conflict resolution within our communities and families. Narrative mediation is a concept that blends narrative theory with traditional mediation practices. This blending makes narrative mediation a distinct communication-based approach to conflict resolution. The result of this unique application of narrative theory to mediation practices achieved by dissolving the problem by changing the story through externalizing the problem. This is accomplished when the external elements of the problem are separated from the individual's relationship to the issue at hand. This occurs through generating a storied history of the problem, and then a re-storying or re-writing process concerning the events preceding the conflict situation.

The different approaches to resolving conflict are all valuable tools with a great potential for creating peace within our society. The need for learning, teaching, and practicing effective conflict resolution strategies within our communities and families is great. The narrative approach to mediation addresses this need in a way that gives the individual authorship over his/her own life experience. Thus, a future study that looks for the distinctions of narrative mediation, within the practices of conflict resolution, would prove a worthwhile inquiry. However, in this study, this researcher will look only at how current practitioners acquire new knowledge that emerges in the field of conflict resolution.

METHODOLOGY

The practice of mediating conflicts is well documented within the history of our world. However, mediation as an emerging practice has only been recognized in the past two decades. The application of narrative theory to mediation is unique if one considers that the concept of narrative goes back to the beginning of time. Narrative theory intersects with the beginning of humanity, for without language there would be no history of
the times of peace/war within the story of our world.

Every human being has a story, a narrative of their life experience. The application of narrative theory to mediation practices has an inherent potential for connecting the shared human experience through story. The capacity to connect during or after a conflict is made possible because elements of the narrative theory parallel elements of communication theory. These theories make a natural blending that - when applied to mediation - are a blending that dissolves problems through the storied experience, and creates an alternate story.

This approach of looking at mediation from a narrative perspective is relatively new and has been emerging through research in a variety of disciplines. There are numerous challenges to exploring the distinctive elements of narrative mediation. There is little research on the subject, and practitioners of narrative mediation are difficult to find. Then there are the ethical aspects of case studies. There are also accepted theoretical concepts to consider and to respect the boundaries of, because they are much larger than the scope of this paper. However, there are distinct elements of narrative mediation that make up a valid communication-based approach to problem solving. By examining it as a separate entity, the elements of communication have the potential to bring change for the person in conflict through the externalizing of the problem. The concept of externalizing the problem is an aspect of narrative mediation that liberates persons through their own knowledge of having power to change the conflict story.

In viewing traditional methods of mediation blended with the narrative theory, this researcher became curious as to the current methods or models of problem solving used by practitioners. This researcher was also curious about how traditional methods change and or merge with new methodology. How do mediators learn about new concepts/ approaches to resolving conflict? This study illustrate the current methods of mediation, and classify the methods by which mediators gain new knowledge in their discipline.

**Description of Methodology**

The method of study will be a survey that explores current approaches to mediation practices. The survey will use yes and no questions, five-point response questions, and opened-ended questions. The survey is formulated to find current methods used in mediation, to determine if practitioners are familiar with the concept of narrative mediation, and to find out how practitioners gain new information in their discipline. The survey will be distributed to practitioners of conflict resolution/mediation by e-mail.
Research Design

- **Population/Sample Size**: 100 individuals who are mediators in the practice of family and community mediation/conflict resolution
- **Sampling Frame**: A list of 750 practitioners of mediation found on the Internet
- **Sampling Method**: The systematic random sampling method was used. Beginning with the first name on the list, this researcher will contact the first 100 mediators who have e-mail addresses and work in the area of family and/or community mediation/conflict resolution
- **Data Collection Method**: A survey that uses a five-point response scale, yes and no and open ended questions will collect data for the study (Appendix). It will be sent via e-mail to practitioners worldwide. The e-mail addresses will be numbered from 1-100, in case the survey must be resent to participants to ensure responses are received.
- **Methods of Data Process and Analysis**: To evaluate current knowledge of narrative mediation and the acquisition of new knowledge by mediators, the survey responses to the question concerning the acquisition of new knowledge will be counted. On this particular question, this researcher will count the response as to which of the five methods the practitioners' use as their primary method of gaining new information. The combined score will then be totaled to obtain the percentage of practitioners who either use books, professional journals, the Web, or attend seminars and/or conferences as a primary source of learning new information emerging about conflict resolution. The percentage of positive responses by mediators who are familiar with the concepts of narrative mediation will also be calculated. The variables include:
  1. Mediators as practitioners of family and/or community conflict resolution
  2. Mediators' methods of acquiring new knowledge of conflict resolution.
  3. Mediators' areas of discipline, length of practice, and methods used.

Summary

The practice of conflict resolution/mediation is broad because of the range of disciplines in which its practitioners are grounded. The theoretical framework of these various disciplines is also of a broad scope. The commonality of these practitioners is found in their skills as mediators
of conflict situations.

The emergence of narrative mediation as a new practice has raised questions for this researcher about how skilled practitioners acquire new and emerging knowledge in the area of conflict resolution. The theoretical base used by conflict resolution practitioners makes for a potentially interesting study of the schools of thought shaping the profession, and the common ground its practitioners manage to find. However, the scope of this paper will focus on the practitioners acquisition of new knowledge, and whether or not the concept of narrative mediation is yet known by current practitioners of conflict resolution.

Results/Findings

The response rate for returned surveys was 70%. A second and third mailing were required to obtain this rate. The results of the survey confirmed the hypothesis that reading books (48%) and professional journals (30%) are the primary methods used by mediators to acquire new and emerging knowledge about the discipline of conflict resolution. At 34%, the survey results also confirm that, well beyond the original 20% estimate, practitioners are aware of the concept of narrative mediation. These results show that the communication concepts imbedded within the narrative mediation approach are gradually emerging in the practice of conflict resolution. The results of this survey also show that current practitioners actively learn about the new concepts being taught in their various disciplines of conflict resolution.

CONCLUSION

The validity of a survey that is conducted via the Internet was taken into account by this researcher. Asking for professional titles, length of time in practice and methods/approaches used in resolving conflicts checked the legitimacy of the responding practitioners. These responses validated the purpose of the survey, and showed the broad spectrum of practitioners' disciplines. For example, licensed mediators ranged from lawyers and social workers to pastoral counselors. The responses also illustrate the many approaches used in the practice of conflict resolution by practitioners who have been in their chosen field from four to twenty-five years.

The common ground found among the diversity of the surveyed mediators and their approach to conflict resolution was the desire to bring about peaceful resolutions to current conflict situations using a variety of different approaches. This finding affirms Coleman's (2000) statement about the scholarly and professional search for a better way to bring about
peace through successful resolutions of conflict (592).

With the discussion of conflict resolution literature, this researcher has attempted to establish a foundation for a different or better way of resolving conflict in our homes, society, and nations. This framework is built by illustrating the transformation of the traditional approaches to conflict resolution that is achieved when communication theories, particularly narrative, are blended with the traditional approaches to problem solving.

This study sought to explore the awareness and use of emerging discipline of narrative mediation, by current mediation practitioners, as a communications-based approach to problem solving. The body of literature reviewed for this study establishes the emergence of narrative mediation as a new discipline in our society - one that blends with and transforms existing schools of thought.

The concept of narrative mediation is relatively new and its built-in assumptions break from traditional approaches to resolving conflict, assumptions such as the problem being the problem verses the person being the problem. Practitioners responding to this study's survey wrote lengthy answers to the questions posed. The obvious time committed to the volunteered information, and the curiosity expressed about narrative mediation confirms that practitioners of mediation are genuine in seeking new and emerging knowledge in the field of conflict resolution. This researcher believes that learning is a lifelong experience, and that practitioners of conflict resolution who have a willingness to learn new concepts bring a hope that peaceful resolutions will one day be commonplace in our society.

Considering the simplicity of the research questions the survey method used was appropriate. However, this researcher realized that a better type of Internet survey would be one in which the respondents could simply click a chosen response, and then select a return option that would send the survey back to the researcher. Also, the design of the research project could use some refining, such as a simpler survey format and more concise survey questions.

The future holds much in the way of research on how the concepts of narrative theory are applied to mediation. Narrative mediation concepts are empowering in the sense of allowing the individual to realize that he or she has a choice to resolve conflict in a different way. However, in the process of studying communication and conflict resolution, this researcher has wondered how often the option of mediation is utilized in our society. This question leads to another suggestion for further study: mediators
should be surveyed to determine whether or not they feel that the services that they provide are used to their fullest potential.
Appendix

Survey Instrument

Toni L. Behl ntwoods@foothill.net
Major: Communications
California State University Sacramento
McNair Scholar Summer Research Project

I am doing a survey of current methods in mediation, could you please take a few moments and fill out this questionnaire for my research project. Thank you for your time. Toni Behl

1. What is your professional title?

2. How long have you been in the practice of mediation?
   Less than 1 year  1 to 3 years  4 to 6 years
   7 to 9 years    10 years

3. What methods of mediation do you employ in your practice?
   • Why do you employ this/these methods?

4. Are you familiar with the concepts of Narrative Mediation (Winslade and Monk, 2000) as a method of mediation? Yes   No
   • If so, do you employ this method in your practice? Yes   No

5. How do you gain new information in your field?
(Please rank 1 to 5, with 1 being the most useful.)
Professional Journals
Books
World Wide Web
Seminars
Conferences

6. Have you had college courses in communication?
(Please check courses you have taken)
Conflict Resolution
Persuasion
Interpersonal Communication
Family Communication
Cultural Communication

7. Do you look at the background history of a current conflict?
   Always  Rarely  Sometimes  Never  Does not apply

8. Do you look at the personal experience of the individuals?
   Always  Rarely  Sometimes  Never  Does not apply

9. Please include any additional experience of your mediation practice.
References


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12-step Programs: Does Participation Improve Patient-Doctor Communication?
Connie Reisenweber

Abstract

Introduction Today, more than 2 million members of Alcoholics Anonymous (AA), in 150 countries, hold meetings at all hours of the day and night. An estimated 3% of Americans will attend an AA meeting at some point in their lives. Alcohol addiction affects many of the patients entering the offices of traditional health professionals, and their recovery is impacted by what goes on in those offices (Steigerwald and Stone 1999). Many studies have been conducted - with varied and conflicting results - to assess the effectiveness of 12-step programs in the recovery from alcoholism. To date, no studies have been done to assess how participating in 12-step programs influence patient-doctor communication. This study seeks to address that issue by testing the hypothesis that participation in 12-step programs improves participants' general communication skills and leads to improved communication between them and their doctors.

Methodology Sixty-one participants in the AA 12-step program, from multiple groups in the Sacramento area, were recruited for this study. An 11-question survey instrument was used to gather demographic information and included questions about: participants' perceptions about alcoholism as a disease; whether or not they believe participation in a 12-step program helped control their alcoholism; whether their communication with doctors had improved as a result of participating in a 12-step program; and how they rated their own communication skills.

Data Analysis Survey responses were analyzed, and some interesting trends emerged that suggest further research would prove worthwhile. Because this study included only 61 participants, the sample size is too insignificant to generalize findings to a larger population. However, the findings support the need for future research on this topic.

Results/Findings Of those surveyed, 93% reported that they feel alcoholism is a medical problem with physical symptoms. Over half of the participants (57%) were not currently under the care of a doctor for treatment of their disease, and a little less than half (49%) had been referred to AA by their doctors. Regular participation in a 12-step program reduced the physical symptoms of alcoholism/addiction for 59% of participants. The majority (85%) reporting feeling that participation in a 12-step program improved their communication skills with others. However,
only 65% reported that participation in a 12-step program improved their communications with their doctors. Most participants reported feeling that they possessed better communication skills than their doctors did.

**Conclusion** Participation in 12-step programs lead to more effective communication with others, including doctors, by promoting active listening skills and teaching members how to give confirming responses. These programs provide modeling and mentor-type relationships that can also improve communication skills. Additionally, the program's format offers opportunities for learning how to effectively express emotion, take ownership of feelings (by using "I-statements") and eliminate blaming types of messages - all useful skills for learning to improve interpersonal communications. Future research will reveal a better understanding of the role of self-help groups in the development and improvement of individual communication skills.
Classical Music's Effect on Biofeedback and Voluntary Heart Rate Reduction
C. Makena Hightower

Abstract

Introduction Although classical music's influence on biofeedback have not yet been documented, biofeedback has been reported as being able to reduce one's heart rate after the resting heart rate has been increased. The objective of this study is to determine classical music's effect on biofeedback while trying to reduce heart rate. Methodology Residents of the city of Sacramento and surrounding areas (10 women), aged 18-35 years were included in this study. Each subject was tested in a single 40-minute session. Subjects were assigned to one of four task groups (two subjects per group): (1) control group, (2) conscious heart rate reduction group, (3) music only group, and (4) conscious heart rate reduction plus classical music group. Findings/Results The study supported the null hypothesis. It demonstrated that there was no significant difference among the heart rates of the four groups during the stressor period, the assigned task period, and the post task resting heart rate period. Conclusion Heart rates remained relatively the same through the three examined timed periods. These results suggest that music does not have a significant positive effect on biofeedback and voluntary heart rate reduction.

Introduction

Biofeedback training is a psychological method used to control problems, such as high blood pressure and migraine headaches, through conditioning (Gray, 1999). The conditioning requires the subject to focus his or her mind. The more focused the mind the faster the subject may be conditioned, and the more likely it is that the subject will have an easier time using his or her conditioning in the future. To gauge the patient's level of focus, the brain's activity is measured using an electroencephalogram (EEG), which records the brain's electrical activity as waves. Recently, engineers have begun to study biofeedback and its use of EEG waves. The limited knowledge about and ability for nerve regeneration in lost limbs of patients using prosthetics has been a hindrance in this area of engineering. Engineers are trying to find new pathways by which the brain could control a prosthetic limb while bypassing motor and sensory nerves. Current
research involves developing devices to control prosthetic limbs that are manipulated by EEG waves produced through biofeedback. In order to control the device, the user of the prosthetic limb must first be able to focus and concentrate his/her brain waves. Focusing brain waves is a hard task. Before one can construct an outside device to be manipulated by brain waves, it must be known if brain waves can manipulate the body's natural functions.

Past experiments have shown that humans have some ability to control functions thought to be strictly involuntary processes. Bouchard and Granger (1977) reported voluntary heart rate reduction without exteroceptive feedback (a visual monitor showing the subject's progress in heart rate reduction). In another study, noticeable reduction in migraine headache pain or blood pressure was noted when the patient was trained in biofeedback techniques, or was unknowingly conditioned to use biofeedback techniques in response to a stimulus (Gary, 1999). Training or conditioning involves a stimulus such as a light or a sound. The subject is told that the selected stimulus will be turned on only when the patient gives the desired response. For example, if the subject's task is to lower his/her blood pressure, a light will come on or pleasant sound will play when his/her blood pressure is lowered. With training, the subject is eventually able to lower his/her blood pressure consciously, without the stimulus. These past experiments assessed mainly biofeedback's ability to be taught and examined how people learn differently.

Research on biofeedback's use as a tool in prosthetics is yet to be completed. Biofeedback is mainly used as a psychological tool to control behavior. Behavior, according to some theories of psychology, is controlled through our perceptions and actions. If certain perceptions and actions were consciously controlled, instead of allowing instinct to take over, the behavior would be controlled. So, if a person knows how to control his/her heart rate he/she will be able to do so in any type of emergency situation. For example, firemen are trained to stay calm even when working in a burning building. After a fireman has been trained to handle different fire situations he is able to maintain a relatively normal heart rate when putting out a fire. If the trained fireman were instead asked to chase an armed criminal, his heart rate would likely be elevated. With conditioning, a normal heart rate can be maintained throughout any kind of emergency situation. Recently, biofeedback has been used to control children with attention deficit disorder (ADD), and is coming to be used as a tool for controlling processes of the body, once thought to be involuntary, such as heart rate, migraine headaches, and chronic pain.
Review of Literature

The connection between music and the way the brain works is a recent topic in research. In the past, research has been done on the calming and pacifying effects of music on the body. It has long been known, from the bible times of David and King Saul, that music seems to "soothe the savage beast." From this connection between music and emotion come research on musicians and their emotions. Researchers have examined this connection by comparing musicians' responses before and while playing their instruments. The connection between music and intelligence has also inspired many research projects.

Cash et al. (1997) found that 19 of their subjects who listened to highly structured music scored higher on standardized tests than 15 other subjects who had listened to music that was less structure than that of the first group. They found that the structure of some musical pieces might be the reason for enhanced cognition. However, the statistical significance was not high enough to exclude other undetermined factors. A major weakness in this experiment might have been the fact that the subjects were not exposed to the music for a long enough period of time to exclude other factors, such as stress and anxiety.

A Newsweek (2000) article about Dr. Sandra Trehub's lab and her experiments on six- to nine-month old babies suggests that the brain is prewired for music, and that some forms of intelligence are enhanced by music. Dr. Trehub's experiments found that babies can detect changes in pitch, tempo, and melody. She also found that music containing mostly perfect fourths and fifths is perceived as pleasant, and music that contains mostly tritones, notes separated by six half steps, as unpleasant. Her research is currently on going.

The same article also talks about the study conducted by Gordon Shaw, of the University of California, Irvine, and Frances Rauscher at the University of Wisconsin. Shaw compares three groups of second graders: one group received piano lessons, the second group English tutoring and the third group was the control group. Each group received equal practice time with a math video game. The researchers found that the group who received piano lessons scored higher on a test of ratios and fractions than the other two groups. This experiment concluded that music influences and even enhances arithmetic intelligence, but has little or no effect on other types of intelligence.

Rauscher et al. (1993) found that after taking three standard IQ tests - each followed by either 10-minutes of listening to Mozart's Sonata for two pianos in D major, or listening to a relaxation tape, or silence - students
who listened to the Mozart scored 8-9 points above the IQ test scores of the other students. They also found that the enhancing effect of the music condition was temporal and did not extend beyond the 10-15 minute period during which the subjects were engaged in each spatial task. The researchers concluded that complex music enhances one’s ability to complete spatial tasks. Two weaknesses of the given results may be that the histogram is drawn over only part of the range of experimental values, and that the calculations are full of assumptions.

Doug Elliot (1994) found that there was no significant difference between using muscle relaxation techniques or music to reduce the anxiety of patients in a coronary care unit. Elliot found that neither music nor muscle relaxation techniques reduced anxiety in patients when either one was used in two or three 30-minute sessions, over a 24-hour period. He concluded that his results differed from similar studies, and the results reported to be viewed with caution. One weakness in this experiment might have been that the patients used were not amenable to the types of intervention used. The researcher suggests that if another study is conducted, a subset of patients amenable to the reported types of interventions be used.

An article in US News and World Report (2000) reported on the use of biofeedback at Columbia Hospital in Milwaukee. The report was about a program started to help people who have chronic pain, and have not been able to get relief. The program uses both drugs and biofeedback to help relieve and control chronic pain symptoms. Biofeedback is used as a relaxation technique. New research has shown that chronic pain comes from both a patient’s body and mind. Agony from the pain creates stress, and that stress then magnifies the pain. When this cycle continues, the patient is left to live a life of pain. Using biofeedback the patient learns to relax and soon the pain can decrease and sometimes go away completely. In cases where nerves have been damaged and the pain cannot completely disappear, the pain is reduced to a minimum and the patient can resume the activities he/she once enjoyed. This type of rehabilitation has been successful for over 3,000 patients who were enrolled in the program.

A case study done by Robert Gatchel (1977) used biofeedback training to try to reduce the heart rate of the study’s subject. The subject was experiencing panic attacks and sought help though biofeedback. He was trained to use biofeedback to voluntarily reduce his heart rate during an attack. The reduction in heart rate would in turn relieve the symptoms of the panic attack, allowing the subject to regain control. Gatchel’s analysis indicated a significant reduction in the number and severity of the attacks.
Biofeedback was successful in this case study.

Malcuit and Beaudry (1980) conducted an experiment to assess the effects of biofeedback-assisted voluntary heart rate reduction following a task intended to induce cardiovascular activation. Twenty-seven male subjects were randomly assigned to three groups. All subjects were submitted to the task and, depending on their group assignment, the task was either followed by biofeedback-assisted or unassisted heart rate lowering or a relaxation period. The researchers concluded that, in assisting heart rate reduction, biofeedback was not more effective than were instructions to relax. One weakness could have been that the amount of subject training could was too limited.

Pollard and Ashton (1982) compared visual feedback, auditory biofeedback, combined visual and auditory biofeedback, instructions to decrease heart rate without biofeedback, sitting quietly, abbreviated relaxation training, and a group of 10 experienced meditators. The meditators were subjects in the study, and their group assignment was meditation. The researchers concluded that for a heart rate decrease task, there was no significant advantage to subjects receiving visual, auditory or combined biofeedback. All the groups showed a decrease in heart rate over the session.

John Allison (1970) investigated the respiratory changes that take place while a person is practicing transcendental meditation. Three small thermistors were suspended from a light plastic headband. One thermistor was placed in front of each nostril and the other was placed in front of the mouth. The temperature of the thermistors was related in a nonlinear way to the velocity of air passing over it. The subject was asked to read a book for some minutes then meditate for 30 minutes, and then return to reading the book for some minutes. Allison found that as soon as the meditation began the respiratory rate decreased. When the meditation was stopped, the rate increased to the same level as before the meditation had begun. Meditation, like biofeedback, is a mental technique. Allison concluded that profound change in physiological events accompanies the mental activity of meditation.

Clemens and Shattock (1979) tested the hypothesis that voluntary heart rate control is possible with simultaneous muscular effort. Eight male subjects received biofeedback training to both raise and lower their heart rates. They also practiced handgrip exercises that required different levels of effort. The men were told to either raise or lower their heart rates while simultaneously performing muscle contractions. The researchers found that the men were able to both raise and lower their heart rates during the
muscle contractions. The muscle contractions simply increased the subject's baseline heart rate. Because the subjects were able to voluntarily control muscle contractions, Clemens and Shattock concluded that biofeedback therapies might be used clinically in real life.

A study on whether music will affect biofeedback's ability to control heart rate has yet to be done. Studies were done to see if different types of bodily functions would decrease biofeedback's ability to control heart rate. Most other biofeedback research was done to prove the effects of the technique or to prove that the technique does indeed work. Experiments done about the effects of music on cognition show that it does enhance the brain's cognitive function and spatial task performance.

**Purpose and Objectives**

The relevant variables being tested in this experiment are the effects of classical music (an environmental aspect) on biofeedback and, to some extent, biofeedback's ability to reduce heart rate as compared to other techniques. Not many tests have been done on environmental aspects that may or may not influence a subject's effectiveness when using biofeedback to control body functions, such as heart rate.

Finding environmental aspects that may indeed enhance the ability of the brain to focus EEG waves may potentially benefit those trying to engineer highly functional prosthetics. Classical music may have pacifying affects on humans. It has also been shown to enhance cognition (Cash et al, 1997), perhaps enhancing the brain's ability to focus on concentrating EEG waves to control prosthetics or the body's natural functions.

This study was limited because it used only one specific type of environmental aspect. There is a chance that many other environmental aspects of the testing room may effect the outcome. This possibility will be reduced as much as possible by trying to contain the room in exactly the same manner for each subject.

**Hypothesis**

This researcher hypothesizes that classical music will greatly enhance the brain's ability to focus and concentrate its waves to reduce heart rate voluntarily.

In order to use biofeedback techniques to control external devices, its ability to control internal bodily functions must first be determined. Many experiments have shown that biofeedback does, in fact, work to control internal functions, such as heart rate. With this result, the effect of both internal and external techniques on the usefulness of biofeedback should also be assessed. The enhancing affect of music on cognitive brain function
and spatial task performance has been proven. The effect of music on biofeedback has not yet been tested, however the following methodology provided a means to do just that.

**Methodology**

The lack of evidence in support of whether music may or may not have an effect on biofeedback has created a hole between music and biofeedback. Biofeedback is a mental process that, so far, is used to control internal functions of the body. Music has been shown to improve the brain’s cognitive ability. The mental process of biofeedback may be enhanced through music. This purported relationship might be demonstrated through the following methodology.

Twenty- to twenty-five female subjects between the ages of 18-35, who report they enjoy classical music, will be divided randomly into groups of five. The five groups will be: the control group, the classical music only group, the conscious heart rate reduction group, the conscious heart rate reduction plus classical music group, and the relaxation group. Further explanation of the groups will be presented later in this paper.

Each subject’s heart rate will be taken throughout the experiment. Depending on the group to which they are randomly assigned, each subject will be given a task.

Subjects will be seen in single, individual sessions lasting no longer than 60-minutes. All subjects will be given the same general instructions, and then each subject will be given specific instructions according to which group they are assigned. For a general timeline of events see Figure 1. Each subject will sign a consent form before the experiment begins. Their heart rates will be continuously monitored and recorded (an electrocardiogram [ECG]) using a standard limb lead II that is attached to a Biopac student Lab Pro data acquisition system. The ECG picks up the electrical signals that the body produces each time the heart beats. Online analysis will provide continuous heart rate measurements. Rubbing alcohol will be used to clean the skin on the inner part of both wrists and the left ankle. A self-adhesive recording electrode containing electrode gel will be applied to the cleansed areas. The non-toxic gel enhances the sensitivity of the electrode, allowing for better reception. After the electrodes are placed in the proper position, subjects will asked to remain motionless for a five-minute period. After five minutes have elapsed, a baseline heart rate will be recorded for one minute. The table on which the subjects will lay is a standard metal examination table. The subject’s head will be propped up at a slight angle with a standard pillow.

A stressor (mental arithmetic) will be used to arouse and raise the
subject's baseline heart rate. Each subject will be instructed to solve, as quickly and precisely as possible, arithmetic problems given orally during 10 periods of one-minute each. The mental arithmetic tasks, similar to those used by Malcuit and Beaudry (1980) will consist of a list of problems that are to be completed during the one-minute period. The problems given orally will be a mixture of both addition and multiplication problems, and consist of mixed difficulty. Subjects will be asked to verbally give the solution to each problem before being given the next problem. Immediately following the mental exercise period, the subject will be instructed to perform a group specific task for two minutes, with as little physical movement as possible. After the two-minute period, the subjects will be told to stop the task and wait while their heart rates are recorded for an additional one-minute. Following is a description of each group's two-minute task:

- Group one/Control group will be instructed to wait.
- Group two/Classical music only group will be instructed to wait while classical music is played.
- Group three/Conscious heart rate reduction only group will be instructed to consciously try to lower their heart rates.
- Group four/Classical music and conscious heart rate reduction will be instructed to consciously try to lower their heart rates while classical music is played.
- Group five/Relaxation group will be instructed to try to relax. This group will be tested only if enough subjects are found to fulfill the requirements of the four other groups. This group will be compared to the biofeedback groups to see if biofeedback is the superior method of the two.

The stress given to increase the baseline heart rate should be effective enough for the intended purpose, which is to increase the heart rate by about 4-5 beats. However, the stressor is not strong enough to be considered a risk. There may be a slight, temporary psychological discomfort associated with the stressor, similar to that brought on by a midterm. Subjects will be informed of the test prior to signing the consent form.

**Data Analysis**

This researcher will use one-way ANOVA to analyze the mean heart rates of the different periods in the four groups. The null hypothesis to be tested is that there will be no significant differences among the increased heart rate of the groups due to the stressor, the heart rate during the
assigned task, and the post-task resting heart rate. The significant difference in the results will show that one method is better at reducing heart rates to baseline after each period of stress.

The method used to test the relationship between biofeedback and classical music is relatively simple. Four to five groups of subjects will be tested in one session lasting about 60 minutes. After the subjects' baseline heart rates are increased using a mental arithmetic task, each group will test a different way to reduce heart rate. As stated previously, the five groups will be:

- control group
- classical music only group
- conscious heart rate reduction group
- conscious heart rate reduction plus classical music group
- relaxation group

Note: The relaxation group will only be tested if enough subjects are found for the other groups. Heart rate will be continuously recorded using an online analysis system. Data will be analyzed using a one-way ANOVA.

Results/Finding

Ten subjects completed the study. The four groups - the control group, the classical music only group, the conscious heart rate reduction group, and the conscious heart rate reduction plus classical music group - had two subjects each. Two subject's results were not included in the calculations due to either a timing error or because the subject was unable to lie relatively motionless throughout the session. The average age of the subjects was 21.5 years. All of the subjects were either current college students, entering students, or had graduated from college within the past six months. All of the subjects listen to music frequently and reported listening to a wide variety of music, including classical. Of the subjects who listened to music during their sessions only one stated a dislike for the chosen piece. Another stated that she had enjoyed the piece, while the others stated no preference.

None of the subjects remained completely motionless through each session. Many subjects complained about the discomfort of having to lie motionless for a period of 40 minutes. Various irritations arose, such as itching body parts and tearing eyes, and caused subjects to move. Most of the subjects took care of the problem without notifying the researcher first, which caused disruption in the ECG recording of the heart rate. For those subjects who did notify the researcher before moving, the ECG recordings
of the heart rates were disrupted very little, if at all.

The null hypothesis of this research is that, for each of the four groups, a one-way ANOVA on the mean heart rates showed no difference during the:

- stressor period and the task period
- stressor period and the post-task resting heart period
- task period and post-task resting heart rate period

The null hypothesis was supported. There were no statistically significant differences among the groups for mean heart rate between the stressor period, task period, and the post-task resting heart rate period (P > .05 for each compared group).

**Discussion**

The major finding of this study was that the use of classical music as biofeedback intervention did not significantly reduce the heart rate of the subjects; no measurable benefit was evident when music was used alone or in conjunction with biofeedback techniques to reduce heart rate.

Results from the study show some reduction in the heart rate between the stressor period to the assigned task period. However, the reduction is similar through all four groups studied. The nonsignificant task effects are in agreement with some previous studies (Elliott and Pollard and Ashton), but seem to be in contrast to other studies (Rauscher and Malcuit and Beaudry). The reason for only a slight decrease in heart rate from the stressor period to the task period may have been caused by an inability of the stressor period to cause a significant heart rate increase. Without a significant increase in heart rate it would be hard to significantly decrease a resting heart rate without formal biofeedback training or conditioning sessions.

The fact that all of the subjects were young and either in college or recently graduated may have acted as an unaccounted for independent variable in the inability of the stressor period to work as proposed. The subjects, used to taking tests that cause greater anxiety, may have unknowingly conditioned themselves to maintain a low heart rate for situations such as the one presented in the stressor period of this study. Nearly 38% of the participants majored in subjects that require high levels of arithmetic study, including biological science and electrical and computer engineering. This factor was not taken into account when the simple addition and multiplication problems were constructed for this study.

Another factor that might have affected the results is this researcher's relationship to the subjects. The only subjects who responded to this
study's advertisement for participants were coworkers, friends, or family members of this researcher. This might have decreased the level of anxiety the subjects experienced during each session. This preexisting relationship may have created an environment that was too relaxed. Also, measurements, such as heart rate, may not be precise enough to detect changes in biobehavioral interventions, especially in subjects with low levels of anxiety (Elliott, 1994).

**Conclusion**

This study indicates that the use of classical music, specifically the piece Moonlight Sonata by Beethoven, proved to be no more beneficial than the other methods tested. Classical music did not significantly influence biofeedback during voluntary heart rate reduction by subjects in the study. The null hypothesis was supported. No statistically significant reductions in heart rate were achieved for the three experimental groups when music and/or biofeedback were used in one 40-minute session. Findings should not be viewed as definitive. Further research needs to be conducted to test the reported trend of this study. It would benefit future researchers to find subjects who are unknown to the research facilitator, and who will lie completely still for a period of no more than 60 minutes. It may also be beneficial to select fewer study participants.
### General Timeline of Events

<table>
<thead>
<tr>
<th>Wait Period</th>
<th>Resting HR</th>
<th>Stressor</th>
<th>Assigned Task*</th>
<th>Resting HR</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5 minutes</td>
<td>1 minute</td>
<td>1 minute</td>
<td>2 minute</td>
<td>1 minute</td>
</tr>
</tbody>
</table>

*There are several different tasks, each assigned by group.*
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Parent and Peer Attachment during Adolescence: Their Impact on the Initiation of Sexual Activity
Ana Orozco

Abstract
A study was conducted to examine the relationship between parent and peer attachment and sexual activity among adolescents. Participants consisted of teenagers from Sacramento, California (16 males and 9 females, ages ranged from 15-19 [M = 16.92, SD = 1.15 years]). Participants completed the Inventory of Parent and Peer Attachment, the Parent and Peer Influence Scale, the Rosenberg Self-Esteem Scale and a dichotomous item regarding sexual activity. This researcher was hypothesized that strong parent and peer attachment would be positively correlated with self-esteem and associated with late onset of sexual activity. Results indicated that participants with strong peer attachment had greater self-esteem than that of participants who did not have strong peer attachment (r (25) = .41, p < .05).

Introduction
Parent-child attachment, particularly mother-child attachment, engenders a lasting impression in a child's life. Attachment is characterized:
"...as a relatively long enduring tie in which the partner is important as a unique individual and is interchangeable with none other...a seeking of closeness that, if found, would result in feeling secure and comfortable in relation to the partner...security and comfort [are] obtained from the relationship with the partner, and yet the ability to move off from the secure base provided by the partner, with confidence to engage in other activities" (Ainsworth, 1989).

A sound parent-child attachment is the foundation for the successful formation of future relationships, as well as for successfully transitioning through life's stages, particularly adolescence (Armsden & Greenberg, 1987; Mullis, Hill, & Readdick, 1999).

Adolescence is a pivotal period in a child's life. It is comprised of hormonal changes, a search for self-identity, and a desire for autonomy. During this period, adolescents seek to maintain a relationship with their parents and simultaneously branch out in order to form new relationships with peers (Dekovic & Mceus, 1997; van Beest & Baerveldt, 1999). Strong parental attachment during adolescence facilitates the formation of positive relationships with peers and provides adolescents with emotional support, a positive self-identity, and a general sense of well being (Armsden &
Greenberg, 1987; Dekovic & Meeus, 1997; Field, Lang, Yando, & Bendell, 1995; Greenberg, Siegel, & Leitch, 1983; Paterson, Pryor, & Field, 1995). Conversely, low parent-adolescent attachment is associated with depression, misconduct, and resentment and alienation toward parents (Armsden & Greenberg, 1987; Raja, McGee, & Stanton, 1992). Multiple studies reveal that adolescents form stronger attachments with their mothers than with their fathers (Ainsworth, 1989; Field, Lang, Yando, & Bendell, 1995; Miller & Lane, 1991; Mullis, Hill, & Readdick, 1999). In addition, mothers more so than fathers, have been found to contribute to greater adolescent happiness, satisfaction, and psychological health (Miller & Lane, 1991). Few studies have disclosed a greater attachment to fathers than to mothers (Dekovic & Meeus, 1997). Thus, the extent to which adolescents form greater attachments with one parent as opposed to the other is one of the questions this study seeks to investigate.

In addition to parental attachment, peer attachment is also a crucial factor during adolescence. Sound peer attachments enable adolescents to develop social competence, awareness for leisure activities, and awareness for age-specific norms (Paterson, Pryor, & Field, 1995; van Beest & Baerveldt, 1999). In their study about adolescents' perceptions of their intimacy with parents and peers, Field, Lang, Yando, and Bendell (1995) found that intimacy with friends was associated with lower levels of dangerous behavior for adolescents. Granted that strong parent and peer attachments are independently beneficial to adolescents, parental attachment has been identified as more significant than peer attachment during adolescence (Armsden & Greenberg, 1987; Field, Lang, Yando, & Bendell, 1995; Greenberg, Siegel, & Leitch, 1983; Paterson, Pryor, & Field, 1995). Research reveals that peer-adolescent attachment is greater when parent-adolescent attachment is low (Dekovic & Meeus, 1997). The degree to which either parents or peers have a greater influence on adolescent behavior is a secondary factor this study seeks to examine.

Strong parental attachments have been connected to higher levels of self-esteem for adolescents (Armsden & Greenberg, 1987; Colarossi & Eccles, 2000). McCormick and Kennedy (1994) conducted a study in which college students were administered questionnaires regarding their degree of attachment to parents and their levels of self-esteem. The researchers found that securely attached students had greater self-esteem than students who were insecurely attached to their parents. Although peer attachments are an integral element of adolescence, peer-adolescent attachment has not been found to be associated with higher levels of self-esteem for adolescents (Field, Lang, Yando, & Bendell, 1995; Giordano, Cernkovich, Groat, Pugh,
& Swinford, 1998).

Sexual activity is another major factor in the lives of adolescents. Increasingly, adolescents are engaging in sexual intercourse at an early age. Although there are many factors that influence the onset of sexual activity during adolescence, parent and peer attachment have been associated with the onset and delay of adolescent sexual intercourse. Research regarding adolescent attachments and the onset of sexual activity is controversial. Whitbeck, Yoder, Hoyt, and Conger (1999) examined the relationship between sexual activity and parental relationships for eighth through tenth graders. The results revealed that parental influence was instrumental in delaying sexual intercourse only until the ninth grade. Similar research reveals that strong parent-adolescent relationships and interactions delay the onset of sexual intercourse regardless of the adolescent’s age (Watts & Nagy, 2000; Whitbeck, Hoyt, Miller, & Kao, 1992). Conversely, Taris and Semin (1997) revealed that sound parent-adolescent relationships are connected with early initiation of sexual intercourse. Minimal research has been dedicated to peer-adolescent attachment and the onset of adolescent sexual activity. However, research discloses that positive peer-adolescent relationships are associated with delayed onset of sexual activity. These issues will also be investigated in this study.

The purpose of this study is to analyze the relationship between parent and peer attachment, self-esteem, and sexual activity among adolescents. In the context of the present study, parent and peer attachment is defined as the adolescent’s perception of his or her affective attachment to his or her parents and peers. Self-esteem is defined as the adolescent’s evaluation of his or her current self-esteem. Lastly, sexual activity is defined as whether or not the adolescent has engaged in sexual intercourse.

This researcher hypothesizes that strong parent and peer attachment will positively correlate with self-esteem and will be linked with late onset of sexual activity.

**Methodology**

The study consisted of 25 adolescents from Sacramento, California. The participants, who were required to be between the ages of 15 and 19, were obtained from the North Area Teen Center, and a local mall in Sacramento. Of the participants, 16 were male and nine were female, ages ranged from 15-19 years of age (M = 16.92, SD = 1.15 years). For their participation, participants received either a soda or a gift certificate to Tower Records.

The *Inventory of Parent and Peer Attachment* (IPPA) (Armsden & Greenberg, 1987) was used to measure participants’ perception of their
affective attachment to their parents and peers. The scale consisted of two parts. The first section pertained to parental attachment and consisted of 28 items, ranked on a five-point scale with anchors 1 - Almost Never or Never and 5 - Almost Always or Always. This portion of the scale was modified so that participants evaluated their attachment to their mother and father individually. The second portion of the scale pertained to peer attachment. This section consisted of 25 items, which were ranked on the same five-point scale as the first section of the questionnaire.

The Parent and Peer Inventory Scale (PPI) (Werner-Wilson & Arbel, 2000) was used to examine whom the participants perceived as a greater influence on their behavior: parents or peers. The scale consisted of 17 items, ranked on a seven-point scale with anchors 1 - Disagree very much and 7 - Agree very much.

The Rosenberg Self-Esteem Scale was used to assess participants' current level of self-esteem. The scale consisted of 10 items, ranked on a four-point scale with anchors 1 - Strongly agree and 4 - Strongly disagree.

The sexual activity of the participants was examined with the single dichotomous question, "Have you ever had sexual intercourse?" In addition, participants were asked to disclose the age at which they first had sexual intercourse.

Participants were obtained from the North Area Teen Center and a local mall in Sacramento, California. All participants received the Inventory of Parent and Peer Attachment, the Parent and Peer Inventory Scale, the Rosenberg Self-Esteem Scale, and the two questions pertaining to sexual activity. Participants were asked to complete the questionnaires honestly, and were informed that their answers would be kept confidential. Participants were allotted the time necessary to complete the questionnaires and were, upon completion, awarded with either a soda or a gift certificate to Tower Records.

Results/Findings

A discriminant analysis was conducted to examine the relationship between the independent variables of:

- self-esteem
- adolescent influence
- attachment to mother
- attachment to father
- attachment to peers

and the dependent variable of whether or not the participant had engaged in sexual intercourse. The discriminant function for sex was not
significant at an eigenvalue of 0.398, p > .05.

Pearson product-moment correlations for all variables were analyzed at an alpha of .05. The results indicated that participants with high self-esteem tended to have greater attachment to their peers than did participants with low self-esteem (r (25) = .41, p < .05). In addition, participants with high self-esteem tended to engage in their first sexual intercourse experience at a later age than participants with low self-esteem (r (25) = .53, p < .05). Lastly, the results indicated that females tended to be more attached to peers than males, r (25) = .40, p < .05).

Discussion

This researcher's hypothesis that high self-esteem would be positively correlated with strong peer attachment was supported. The results disclosed that adolescents with high self-esteem were more attached to their peers than adolescents with low self-esteem. However, the results did not support the hypotheses that strong parental attachment would be correlated with high self-esteem, and that strong parent and peer attachment would be correlated with late onset of sexual activity.

The results are consistent with past research by Armsden and Greenberg (1987), which reveals that, for adolescents, sound peer attachments are associated with greater well being, self-esteem, and life satisfaction. Strong peer attachments provide adolescents with feelings of belonging and approval that in turn allow adolescents to feel confident about themselves overall.

The findings of this research are also congruent to that of Raja, McGee, and Stanton (1992) who found that female adolescents have greater attachment to peers than male adolescents. Females are largely perceived as being more emotional than males, thus having the need to form more intimate relationships than do males.

Subsequent research should utilize a larger adolescent population with an equal number of males and females. Future research should also explore adolescents' attitudes regarding sex, in order to gain insight into their perceptions and feelings on the topic.
References


