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1st Annual UIW Research Day

February 29, 2008 - Marion Hall Ballroom



University of the Incarnate Word
4301 Broadway San Antonio TX 78209

EVENT PROCEEDINGS

Sponsored by:
UIW EARDA Project [Funded by the National Institute of Health]
UIW School of Graduate Studies and Research Office of Research Development [ORD]
UIW Office of Instructional Technology



Dear Colleagues,

With great pleasure I welcome you to the University of the Incarnate Word's First Annual Research Day. Today we establish a new tradition in celebration of academic accomplishment by showcasing the UIW faculty research enterprise which contributes so much to our classrooms as well as to the world. We are indeed fortunate to be a community of educators and scholars seeking to advance our disciplines and help shape the broader community.

Elements crucial to the pursuit of academic excellence include a central place of reasonable and transparent discussion, where the path forward is determined by a critical examination of the past; a focus on reliable interpretations of the natural and moral world; the application of consistent standards of accomplishment; and the inclusive nature of truth-seeking, where insight is prized from commentators of all backgrounds. The relationship between these elements and the pursuit of knowledge remains even as disciplines change form and degree programs come and go. Today, more than ever, the world community must rededicate itself in support of academic environments which nurture this relationship.

As a result of a broad spectrum of work in higher education and by the significant achievements of faculty and students, University of the Incarnate Word enjoys a special place in the world of academe. The research presented today not only showcases disciplinary accomplishment in the art and practice of discovery, but serves to illustrate UIW's commitment to academic excellence.

Research Day would not be possible without the support and effort of many individuals. The list is too long to recount here in full, so instead I will simply indicate the groups that participated in organizing and sponsoring Research Day. These include the UIW EARDA project (sponsored by the National Institute of Health), the members of the Faculty Research Advisory Group, the administrators and staff of the Office of Instructional Technology, and the School of Graduate Studies and Research Office of Research Development. To each individual who contributed to the planning and success of today's event I offer my sincere thanks and gratitude. To all presenters and attendees, please accept my best wishes on this special day.

Sincerely,

A handwritten signature in cursive script that reads "Kevin B. Vichcales".

Dr. Kevin B. Vichcales, Dean
School of Graduate Studies and Research

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WORLD BANK TAX ADVICE: DOES IT OBSTRUCT EQUITABLE DEVELOPMENT?

J. Michael McGuire, Ph.D., David Mitchell, Ph.D., Sister Luz Romay, Ph.D., Nursen Zanca, Ph.D.

Purpose

The purpose of this paper is to explore the role of progressive taxation that falls relatively heavily on the wealthy in generating an equitable development process.

Research Hypothesis

Progressive taxation enhances the satisfaction of basic needs and increases production

Rationale

Progressive taxation leaves more money in the pockets of the poor with which to purchase basic goods and services. The consumption of basic goods and services enhances productivity and participation in the development process. Enhanced productivity increases national production.

The World Bank issues tax advice to developing countries which is often a condition for developing countries to receive loans at preferential rates.

The tax advice issued by the World Bank contains significantly regressive elements. If progressive taxation contributes to the satisfaction of basic needs and to development, the World Bank should revise its advice.

Methodology

Part I of the paper describes the tax advice.

Part II of the paper conducts an econometric analysis that relates the satisfaction of basic needs and tax progressivity to the level of national production.

Preliminary Findings

Preliminary findings are that both the satisfaction of basic needs and tax progressivity increase the level of national per capita income. A one unit increase in the satisfaction of basic needs increases annual per capita income by \$166. A one-unit increase in tax progressivity increases annual per capita income by \$23.

Discussion/conclusions

Additional research must include additional variables in the model and test the form of the equation that was used.

If the conclusions hold, the policy recommendation is for the World Bank to recommend to developing countries more progressive taxation.

DIFFICULTY IN DEFINING AND EVALUATING CREATIVE SCHOLARSHIP AS PART OF THE TENURE AND PROMOTION PROCESS

Melinda K. Adams, Ph.D., Sonya S. Meyer, Ph.D.

Introduction

Defining creative scholarship and evaluation criteria for creative scholarship has been virtually ignored in research even though it has traditionally been given some respect by others outside the design field, especially during tenure and promotion consideration. A definition and criteria were developed to begin to provide an understanding of creative scholarship.

Statement of the Problem

After reviewing the literature in aesthetics, textile and apparel design, and education as well as several tenure and promotion documents, a definition of creative scholarship was not found. A universal definition was needed to provide guidance to professionals within and outside textile and apparel design.

Methodology

The primary purpose of this research was to gather opinions of professionals in textile and apparel design about the definition of creative scholarship. Gathering opinions about the criteria to evaluate creative scholarship was the secondary purpose. The Criteria for Creative Scholarship Survey, which was developed in prior research, was used to meet the goals of this research.

Results

One purpose was to compare respondents' opinions of the definition of creative scholarship with the opinions of the experts. Overall, the majority of the respondents agreed with the definition of creative scholarship. The majority of respondents agreed with the definition, but expressed concerns about aspects of the definition.

The second purpose was to compare means between respondents and experts on the criteria statements. All 15 statements were considered as criteria to evaluate creative scholarship. Means for the respondents were lower than those for the experts. Respondents only identified five statements as critical to the evaluation of creative scholarship.

CONNECTIONS BETWEEN NAMES OF NUMBERS AND STUDENT PERFORMANCE IN MATHEMATICS

Judith E. Beauford, Ph.D.

Purpose

Studies from the last decade and before have indicated a strong correlation between the level of explicitness used to name numbers and children's understanding of place value (Cotter, 2000; Fuson, Grandau, & Sugiyama, 2001). The purpose of this project is the study of language influences on the cognitive understanding of the numeration system and mathematical achievement.

Research Question

Does the use of explicit number names influence development of number sense?

Significance

International comparisons of children show America far from the lead in mathematics and science. Improvement will come only as the teaching and learning of mathematics improves.

Methodology

Since the fall of 2004, we have been working in a full year pre-kindergarten and a kindergarten class in San Antonio, Texas, where we use the tens-and-ones scheme to name numbers in the full year in the pre-kindergarten class and for the first three months kindergarten class. During this time the children are introduced to the numbers from 1 to 100, using otherwise traditional methods and materials. Measures of results include personal interviews conducted by the researchers to assess place value performance with manipulatives, oral, and paper and pencil tasks. The mathematical progress of these children is tracked through elementary school.

Findings

Students evaluated through Spring 2007 used problem solving to move from one decade to the next. Four-year olds correctly identified place value and successfully read and modeled two digit numbers. They were less likely to confuse numbers with letters or to reverse digits. The students have a better grasp of zero as a place holder. Further study will evaluate whether these children approach higher levels on Jones, et al. (1996) hierarchy.

BOTTOM-UP APPROACH FOR REDUCING MALNUTRITION BY CREATING ECONOMIC SUSTAINABILITY IN THE BUKOBA RURAL, KAGERA REGION, REPUBLIC OF TANZANIA

Neeta Singh, Ph.D.

Purpose

The United Republic of Tanzania has abundant land, livestock, and natural resources, which could enable it to achieve faster and more diversified agricultural growth and to raise household income through increased production of both food and cash crops thereby creating economic sustainability. The first Tanzania Mainland Nutrition Survey on children under five and mothers of child-bearing age reports high severity of malnutrition, in the Bukoba rural district, according to the criteria established by the World Health Organization. This project addresses the problem of malnutrition in the Bukoba rural region of Tanzania, and proposes a pilot project that uses existing land and farming skills-set of women to grow soybean to improve diets and create economic sustainability of women and their families in the region.

Methods

Initially, focus group of 42 women representing 220 members of the Bukoba Women's Empowerment Association (BUWEA) was conducted to assess local diet and nutritional knowledge of commonly consumed foods. The focus group's outcome led to a bottom-up solution: creating an infrastructure to cultivate soybean to improve the quality of the existing diet and create economic sustainability among the members of the cooperative and their families.

Results

Initially, BUWEA members were provided financial resources and technical expertise to grow soybean on 10 acres. After harvesting the first crop, the group attended 4 days of workshops and demonstrations on several related topics such as the benefits and the uses of soy in local diets. The workshop also helped the BUWEA seek the local market such as schools and health care facilities for the harvested crops as well as planning the next crop, while increasing knowledge, confidence, and continuity of the project.

Conclusions

The soybean cultivation pilot project presents a need based, bottom-up approach to the problem of malnutrition in the rural areas, with replicability and continuity.

DEVELOPING A COMPETENCY-BASED GRADUATE PROGRAM IN HEALTHCARE ADMINISTRATION: IS IT TIME TO REINVENT THE WHEEL?

Daniel G. Dominguez, Ph.D., Eugenio Fernandez, M.S., FACHE, D. Christine Garcia, Ph.D., FACHE, Kevin LaFrance, Ph.D., FACHE, Alan Preston, MHA, D.Sc., Connie Green, Ph.D., Mark Teachout, Ph.D.

Purpose

The purpose of this study is to determine the competencies critical to managerial effectiveness in early-career healthcare administrators in San Antonio and South Texas in order to develop a competency-based graduate program in healthcare administration.

Research Question

Is the Healthcare Leadership Alliance (HLA) competency framework (HLA, 2007) of sufficient comprehensiveness and specificity to serve as the foundation of a competency-based graduate program in healthcare administration?

Study Significance

The administrative costs of the U.S. healthcare system are estimated at 31% of total costs (Woolhandler et al., 2003). Much has been written about the inadequacy of healthcare administration graduate programs to produce administrators with the knowledge, skills and abilities necessary to manage efficiently and effectively (IOM 2001; Griffith, 2001). Leaders in the field have called for significant reform of existing course-based graduate programs in favor of a competency-based approach (Calhoun et al. 2002; Shewchuk, et al. 2005). As South Texas Baby-Boomers begin to age and require increasing amounts of health related services it is imperative that these services be administered as expertly as possible in order to control costs and assure timely access to quality care.

Methodology

The methodology for this study is a modified Delphi technique that will use senior San Antonio MSA healthcare executives to evaluate the comprehensiveness and specificity of the HLA competency framework. Using an iterative process, executives and academic subject matter experts will identify HLA competencies most critical to success for early careerists. Selected competencies will be organized into an integrated graduate curriculum.

Preliminary Findings

Review of the HLA framework by academic subject matter experts suggests that it is of sufficient comprehensiveness and specificity to serve as the basis of an integrated competency-based graduate program that will meet the professional needs of early-career healthcare administrators in San Antonio and South Texas.

OUTCOMES OF THE *ENFERMERAS DE LOS PIES* PROJECT: PHASE I

Annette D. Etnyre, MSN, RN, Lillian Tilles, MSN, RN, FNP,
Sara Kolb, Ph.D., RN, and Jean Deliganis, Ph.D., RN

Purpose

To evaluate the initial phase of the *Enfermeras de Los Pies* (Foot Nurses) project at the *Ministerio de Salud* (Health Ministry) a partnership of UIW's School of Nursing and Health Professions and St. Philip of Jesus parish.

Background

The increased incidence of diabetes among Mexican Americans and the resulting risk for peripheral neuropathy leads to a high incidence of foot ulcers and preventable lower extremity amputations.

Discussion

The expected outcomes of the project are to: 1) provide access to no-cost foot screenings and appropriate referrals; 2) provide no-cost basic foot care and teaching; and, 3) increase knowledge and skills about self foot care.

Population, sample, and setting

Participants are primarily Mexican American elders. The first 97 individuals who have received initial screenings and care comprise the sample. Eighty nine (92%) were women. The mean age was 73 with a range of 35-95. The screenings were held in Senior Nutrition Centers and in the homes of elders residing near the parish.

Methods

A review of existing records was conducted to evaluate the outcomes. In addition the record review identified the characteristics of the populations served and the incidence and type of foot problems in this population.

Findings

Fifty-one (53%) participants had diabetes and 62 (65%) had arthritis which can be a barrier to self care. Seven (7%) reported a history of ulceration and 10 (10%) had a current impairment in skin integrity on a lower extremity. Calluses were observed in 50 (52%) participants and dystrophic or mycotic nails were present in 52 (53%). Only one fourth of participants had a current podiatrist. Referrals were required for 26 (27%). The most frequent responses to a question asking if the participant learned anything new were as follows: how to do foot exercises (25%); dry between the toes (20%), apply lotion, but not between toes (10% and 20%); and how to massage feet (17%).

Conclusions

Data from the records reveal that the expected outcomes have been met during this initial phase. The review raised additional questions regarding participant perceptions of barriers to foot care. The record format was edited to gather this data during Phase II.

Acknowledgement

This Project is funded through grants from Kronkosky Charitable Foundation and Baptist Health Foundation.

VALIDITY OF A SET OF CULTURAL IDENTITY SCALES AMONG ADULT LATINAS

María Félix-Ortiz, Ph.D., Mario de la Rosa, Ph.D., Patria Rojas, Ph.D.

Purpose of Study

In this study, we attempt to replicate the factor structure and examine other psychometric properties of the Cultural Identity Scales (CIS) in a validation study using a sample of Caribbean Latino mothers and daughters.

Rationale and Significance

The CIS was developed as an alternative measure to traditional unidimensional acculturation scales that fail to measure both Latino and American dimensions separately, and capture various bicultural identities. The CIS also measures this across various domains (e.g., values as well as behavior and language) yielding a “profile” of cultural identity rather than a global acculturation score. Although the CIS showed satisfactory psychometric properties with adolescent and young adult samples, it hasn’t been validated in older adult samples.

Method

We recruited 156 mother-daughter pairs (312 Latinas). Most were foreign-born (70%), and from the Caribbean; about 40 years old on average; and 30% earned about \$5000 a year annual income. We administered the CIS along with validation questions in a face-to-face interview as part of a larger health and drug use study.

Findings and Conclusions

CIS items were submitted to a factor analysis (orthogonal Varimax rotation and ML estimation), reliability analysis (Cronbach alpha), and correlated with several criterion variables (e.g. times visited country, years attended U.S. school, and Marin Short Acculturation Scale) to evaluate CIS psychometric properties in this adult sample. Eight of the ten CIS scales emerged in the adult sample similar to the factor structure in two other younger samples: English and Spanish Language Proficiency scales, Familiarity with American and Latino Culture scales, Preferred Latino Affiliation, Perceived Discrimination, Feminism, and Respeto. All scales showed satisfactory reliability or better, and significantly correlated with several criterion validity variables in the anticipated directions. This study further supports the validity of a multidimensional, multi-domain conceptualization of cultural identity.

DESCRIPTIVE STUDY OF HEALTH INDICATORS OF COMMUNITY RESIDING MEXICAN AMERICAN ELDERS

Sara Kolb, Ph.D., RN, Eula Pines, Ph.D., RN, Jolynn Lowry, MSN, RN, Jean Deliganis, Ph.D., RN

Purpose

The purpose of this descriptive study was to assess learning needs of community residing Mexican American elders living in south central Texas.

Research Question

What are the learning needs of community residing Mexican American elders living in south San Antonio?

Rationale/Significance

In San Antonio, Texas, the Hispanic population is the majority population. Population projections indicate that in the year 2020, 47% of the total San Antonio population aged 65 and over will be Hispanic. As a group, this vulnerable population experiences economic, employment, educational and health disparities.

Methodology

Surveys were completed by a convenience sample during health screening activities at three Senior Nutrition sites in South San Antonio. The survey was designed to address areas of health where nursing interventions of education and health promotion could influence self management. Survey questions were read to the participants in their preferred language. The survey included information about health and self management knowledge and learning needs.

Findings

Ninety community residing Mexican American elders completed needs assessments. All participants were over the age of 50, 83% were female and 17% male. Eighty-seven percent self identified as Hispanic. At first glance, health problems look similar across the three outreach sites, closer examination of assessment data reveals subtle differences. For example, site 2 had a significantly larger proportion of respondents taking medication for arthritis, also had a higher percent of respondents requesting education about arthritis. At Sites 1 and 3, less than 2% requested education on stress management, while at Site 2, 25% of respondents wanted stress management education.

Discussion/Conclusions

When working with community residing Mexican American elders in group settings, assessment data is essential for planning meaningful health programs. Assumptions made from existing literature may not be accurate for subgroups within a larger population.

Acknowledgement

This project is funded by DHHS Grant D11 HP05196

DIFFERENTIAL RESPONSES TO HIGH VOLUME TRAINING IN FIRST YEAR HIGH SCHOOL SWIMMERS

Tim Henrich., Ph.D., Brandon Wang, Ph.D., Robert Pankey, Ed.D., Bill Carleton, Ed.D.

Introduction

Competitive swimmers in elite training programs are challenged with High Training Volumes (HTV) characterized as excessive, energy depleting and detrimental to performances.

Purpose

The purpose of the study was to test the hypothesis that following a period of high volume training; a reduction in volume would result in improved swimming performances.

Methods

Informed consent was obtained from 12 female high school freshman swimmers age (13.9 \pm 7 y.) with documented training of 3 years (315 \pm 23.5 min x wk⁻¹). Following 6 weeks of pre-season training, the program began with HTV increasing from (6 to 13 k x d⁻¹) over 6 weeks, followed by Peak Training (PT) of 10 weeks (11 to 13 k x d⁻¹) followed by 3-4 weeks of decreased training (DETR) to pre-season volumes.

Data Analysis

The swimmers' 50, 100 and 200 yard Freestyle best times were recorded from the previous season's meet results and from results following DETR and transformed to average velocities per lap (m x sec⁻¹). Significant correlations among the velocity measurements requiring a Bonferroni correction factor with dependent sample t-tests to determine if there were swimming performance improvements. The Size Effect (ES) was calculated to determine if the hypothesized improvements were meaningful.

Results

Significant and meaningful differences were found among all comparisons. Correlations (Pearson r and Spearman rho) indicated that the swimmers improved differentially. Improvements in the 50 and 100 yard events bore little relationship to the 200 yard event improvements that resulted from a HVT.

Conclusions

There were substantial benefits from HVT followed by DETR and the HVT permitted swimmers with greater potential in the longer event to gain competitive advantage over swimmers who were more successful in the shorter events. These benefits are attributed to 3 years of adequate preparation, HVT followed by DETR.

LEARNING STYLES ASSESSMENTS: CAN THIS KNOWLEDGE HELP STUDENTS ACHIEVE A HIGHER LEVEL OF SCHOLARSHIP IN CLASSES AT THE UNIVERSITY OF THE INCARNATE WORD

Sally M. Baynton, D.M., Ph.D., Kristy Baynton, Christine Grishom

Purpose

The purpose of this qualitative study was to determine if students enrolled in a Composition Bridge English and a United States History Learning Community during the Fall Term, 2007, benefited from an understanding of their personal learning styles using the Kolb Learning Styles Inventory Assessment.

Research Questions

One reason for this study was to ascertain if students believed assessment results were appropriate. Another purpose was to determine if students could predict two of their instructors' learning styles. Finally, students were asked to articulate whether this information was useful in classes where a teacher's learning style varied from the student's learning style.

Rationale/Significance

This information is important to current and to future students at UIW because, if students understand how they learn, they think of alternative ways to assimilate information when instructor's delivery methods do not match their individual learning style.

Methodology

The population for this study included first-semester students enrolled in a Learning Community consisting of Composition Bridge course and a History of the United States course. The Kolb Learning Styles Inventory Assessment was administered to the students during the Fall Term, 2007. They were asked to prepare group presentations according to learning styles to ensure subject mastery. The students were asked to respond to ten questions, both demographic and learning styles-oriented, to understand if this knowledge empowered students to achieve better results and higher scholarship in their individual classes.

Findings/Conclusions

The qualitative results indicated students benefited from this knowledge. Students understood how they learned best and under what circumstances they learned best. They were able to predict the learning styles of their two teachers. Additionally, they also enunciated that this information could help them in classes where their teachers do not conduct the classroom in manners that coordinate and/or are compatible to the student's personal learning style.

BEGINNING TEACHERS, RESILIENCE AND RETENTION

Linda A. Malcom, Ph.D., Jovita Ross-Gordon, Ph.D.

Purpose

This qualitative study was to examine how beginning teachers with one, three or five years of practice developed resilience and how it impacted their retention.

Research questions

(1) How do beginning teachers develop resilience? (2) How does resilience contribute to beginning teachers' retention?

Significance of research

The attrition of beginning teachers (50% by the 5th year of practice) is a costly phenomenon for taxpayers and students (Texas' cost around \$502.5 million a year [Combs, 2006]).

Methodology

Collective case study methods in the phenomenological tradition were used to study 14 teachers from 5 different districts around San Antonio and Austin. Peers nominated participants as representative of resilient teachers on their campus. Data were collected through nomination forms, in-depth semi-structured interviews, critical incident reports, and e-mail journaling. These items constituted 14 individual data sets which were analyzed using open coding procedures revealing themes of resilience and environmental contexts. Matrices were also constructed to facilitate cross-case analysis. Peer debriefing and member checks were used to enhance validity.

Findings

These teachers were very clear that to persist they needed a positive environment with good relationships in their educational communities. Their ability "to stick around" was built through the development of internal resilient resources that the literature states are inherent in all of us. The driving force for these participants seemed to be "know one's self and one's passion or purpose".

Conclusions & Recommendations

(1) for practice- to apply resilience theory to the educational work environment and for administrators to create a positive and respectful work environment; (2) for teacher preparation programs - to address students' resilient attributes and create more realistic activities; (3) for future research - to investigate the impact of a nine-month long internship as compared to a semester long practicum and examine how schools promote the building of relationships.

EXAMINATION COLOR-CODING VERSUS STUDENT ACHIEVEMENT IN COLLEGE MATHEMATICS COURSES

Paul F. Messina, Ph.D., Flor de Maria Garcia-Wukovits, Ph.D.,
Sue E. Stankus, M.Sc., James D. Stamey, Ph.D.

Purpose

To test the common myth of color bias in college level testing.

Research Question

Is there a difference in student achievement based solely upon the color of an individual examination instrument at the collegiate level of instruction?

Rationale/Significance

Student achievement in College Geometry, Pre-calculus, and Probability and Statistics based upon the color-coding of the final examination was examined. Multiple class sections taught by the same teacher were utilized to minimize possible confounding variables. This study supports as well as expands the results of recently published articles concerning the phenomenon of color bias in testing in the collegiate environment. It differs significantly from previously published results as we analyzed small enrollment classes versus large enrollment classes, free response test items versus multiple choice test items, multiple subjects, and the inclusion of a white examination sample to serve as a control group for the study, thereby making a contribution to the current body of knowledge.

Methodology

Our research used an ex-post facto design and the Kruskal-Wallis Rank Sum Test.

Findings/Conclusions

Based upon the examination color, there is no significant statistical relationship between the means of the examination scores ($p \geq 0.05$). This conclusion directly counters the common myth of color bias often encountered in the classroom.

AN EXPLORATORY STUDY OF CARDIAC HEALTH IN COLLEGE ATHLETES

Laura R. Muñoz, Ph.D., RN, Gary Norgan, Ph.D., RN, Maureen Rauschhuber, Ph.D., RN, David Mitchell, Ph.D., Cynthia Richardson, MSN, RN, David Allwein BSN, RN, Suzanne Beltz, Ph.D., RN, Jennifer Cook, MSN, RN, Annette Etnyre, MSN, RN, Irene Gilliland, MSN, RN, Marveen Mahon, BSN, RN, Vanessa Mikan, Jolynn Lowry, MSN, RN, Brent Powell, M.A.A., Renee Sethness, Ph.D., RN, Mary Elaine Jones, Ph. D., RN

Purpose

The purposes of this exploratory study of college athletes were to: 1) identify the objective and subjective indices of cardiac health, and 2) determine the relationship of these indices to physical fitness.

Hypothesis

There will be a relationship between objective and subjective indices of cardiac health to physical fitness in college athletes.

Rationale & Significance

College years are frequently a transition time as young adults gain increased control of their lives. Researchers have documented several risks for cardiac disease among college students (Hlaing, Nath, & Huffman, 2007; Sparling, Snow, & Beavers, 1999; Spencer, 2002). College athletes are assumed to have higher levels of fitness than non-athlete counterparts, but little research about the relationships among objective measures of health and physical fitness exists.

Methodology

Using a descriptive correlational design, a convenience sample of 140 athletes from a private, Catholic university in the southwest United States (US) was screened. Objective measures of cardiac health included a physical fitness measure, blood pressure, height, weight, body mass index (BMI), hip and waist circumference, blood lipids and glucose.

Findings

A majority of subjects were single, White or Hispanic freshmen or sophomores born in the US with a mean age of twenty years of age (range = 17-25). The mean BMI was 23.5, with 29% in the overweight/ obese categories and 20% in prehypertensive category. A logistic regression revealed that an increased waist circumference was associated with increased blood pressure levels among females.

Conclusions

This study went beyond previous studies by examining objective indices of cardiac risk and measuring physical fitness. Although most athletes in this study had few objective cardiac risk factors, a proportion were overweight, had elevated blood pressures and BMIs. This finding has implications for health assessment of college athletes and supports the need for physical fitness among all young adults.

NAVIGATING BARRIERS: AN ASSESSMENT OF BACCALAUREATE STUDENT SUCCESS

Maureen Rauschhuber, Ph.D., RN, Jennifer Cook, MSN, RN, Julie Nadeau, MSN, RN

Background

Although state governing bodies and community agencies have requested increased enrollment of students in nursing and athletic training education (ATE) programs, many students in such programs leave college before fulfillment of their educational goals.

Purpose of the study

The purpose is to determine characteristics of successful nursing and athletic training education students after admission to their major at the University of the Incarnate Word.

Discussion of the issue

Padilla's (1999) Expertise Model of Student Success focuses on the knowledge that successful students possess and the actions they take to overcome barriers in order to attain a college degree. Successful students take effective actions to overcome each specific barrier that they face, and such actions are based on specific knowledge that is relevant to the problem at hand.

Methods

Seventy-four nursing and 14 ATE students were interviewed and audio-taped during one of seven scheduled focus group meetings. Padilla's (1997) Unfolding Matrix was used to acquire data regarding student perceived barriers, knowledge and actions students utilize to negotiate the barriers, recommended program changes, and speculation about potential problems that could result from the changes.

Findings

Seven themes of student perceived barriers were identified: clinical rotations, courses and faculty, overall academic and skill preparation for the program, financial aid, student specific preparation, program and university barriers. Nursing and ATE students experienced difficulties juggling family and work obligations with rigorous academic expectations and program inflexibility. Successful students negotiated the barriers by readjusting their personal schedule and commitments and by independent problem solving.

Implications

All successful college students experience barriers and identify mechanisms to circumvent them. Faculty notification of study findings may foster greater understanding of contemporary college student experiences. Incoming student notification of findings may facilitate their transition to the major.

NEARNESS SPACES AND ITS APPLICATIONS

Zhou Yang, Ph.D.

Purpose of the Study

To study the properties of Nearness Spaces and its applications in digital topology and image processing algorithms.

Research Question

What type of results in classical topology can be migrated into the theory of nearness spaces? What kind of new results can be developed within the framework of “nearness spaces” that did not exist in classical topology? What kind improvement can be made to the existing image processing algorithms by the application of the “nearness” concept?

Rationale/Significant of the Research

Herrlich introduced the concept of “nearness” space in 1974 as a generalization of the concept of Topology and to be used as a unifying framework to include a number of other topological-like structures. Recently, the notion of “nearness” in a number of different variations has found new applications in digital topology, image processing and pattern recognition areas. Existing literature also suggests that it is possible to introduce a nearness relation that can be used to determine the “nearness” of sets of objects that are possibly spatially far away and, yet, “qualitatively” near to each other, which opens the door to the field of pattern recognition.

Methodology

Migrating existing results in classical topology, developing new theorems in the framework of nearness, apply theoretical results to develop new algorithms for image processing.

Findings and Conclusions

Established a direct embedding functor constructively from the category of Proximity Spaces to the category of Nearness Spaces. Studied the properties and behavior of Nearness Subspaces. Defined the concept of point-wise convergent nearness structures and generalized two Ascoli-Arzelà type of theorems from topological spaces to nearness spaces. The last theorem linked the compactness of the function spaces into the compactness of the cross-sections at a fixed point.

PERCEPTIONS ABOUT BLOOD PRESSURE AMONG MEXICAN AMERICAN ELDERS DIAGNOSED WITH HYPERTENSION

Sara Kolb, Ph. D., RN, Jean Deliganis, Ph. D., RN, Perla Zarate-Abbott, MSN, RN, Maria Gillespie, MSN, RN, Monica Ramirez, MSN, RN, Gary Norgan, Ph.D., RN

Purpose/Aims

The purpose of this descriptive pilot study was to explore the perspective of Mexican American elders with hypertension about their disease.

Research Question

What are the perceptions of hypertensive Mexican American adults about their hypertension using Kleinman's Patient Explanatory Model as a framework?

Rationale/Significance

Hypertension affects 65 million Americans. Control of high blood pressure can be accomplished by clients and health care providers working together, and control can help prevent life-threatening illnesses. Mexican Americans with hypertension are less likely to have their blood pressure under good control (<140/90). Clients served by the *Ministerio de Salud*, have a high incidence of diagnosed hypertension which is not well controlled.

Methodology

A convenience sample of 11 Mexican American elders who are under treatment for hypertension participated in the study. A structured interview guide was developed using Kleinman's (1978) Patient's Explanatory Model as the frame. Questions about self-care and education were included. The interviews were tape recorded, and transcribed with no identifying information included on the transcripts. The researchers read the transcriptions individually, followed by collective discussions to extract major themes.

Findings

9 females and 2 males, ages 52 to 86, completed the interviews. They had been under medical treatment for hypertension for between 1 ½ and 30 years. Education level ranges from 7 to 14 years. No one subject had a view of hypertension that would totally match the biomedical model. Common themes included: hope that hypertension would have a short course; belief that taking medications was sufficient, nothing else was needed; incomplete pictures of the cause and treatment of hypertension.

Conclusions/Implications

This small sample of Mexican American elders had inadequate information about their disease process, consequences and treatment. Their understanding of the condition was not derived from health care providers. Knowing patient's personal perceptions of their medical diagnosis is valuable in planning self-management educational programs.

Acknowledgement

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STABILIZATION OF THE RAPTOR 50 LPV MODEL BY PSO PREDICTIVE CONTROL

Michael T. Frye, Ph. D.

Purpose of the Research

A collaborative program with the University of Kansas, Department of Aerospace, the Raptor 50 Program examined the feasibility of using a real-time Particle Swarm Optimization-Predictive Control (PSO-PC) technique to stabilize a 6 degree-of-freedom simulation of the Thunder Tiger Raptor 50 V2 remote controlled helicopter.

Research Question

The addition of predictive control to the problem of negating the effects of model uncertainty will add robustness to the flight handling qualities of the Raptor 50 helicopter.

Significance of Research

Due to the changing dynamics of the helicopter, the problem of developing a controller that was robust to model uncertainty needed to be addressed. The Predictive Control technique was chosen due to its ability to change the control law gains which ameliorates the handling qualities of the helicopter in a simulation environment.

Methodology

The Predictive Control technique is developed using an evolutionary algorithm called Particle Swarm Optimization (PSO). PSO is a non-gradient stochastic based optimization method that is inspired by the search techniques of bees. Individual particles search for either a minima or maxima based on a chosen cost function. A swarm behavior is exhibited due to a sociability gain among the individual particles. The PSO algorithm is capable of finding multiple control law gains quickly and without the need of an equation. Furthermore, due to the fact that PSO is a parallel process, the optimal control solution can be found very quickly.

Findings and Conclusions

The PSO-PC formulation allowed for a tractable solution in computer-time. While the goal of stabilizing the helicopter was met in various flight conditions, the issue of real-time implementation will need to be further addressed and is currently being investigated.

FACTORS ASSOCIATED WITH PERCEPTIONS OF DESTINY FOLLOWING THE AFTERMATH OF HURRICANE KATRINA

Sarah Williams, Ph.D., RN, BC

Purpose

The purpose of this study is to describe perceived level of control, overall reactions, and sources of support of survivors. The study sought answers for the following research questions: (1) What was the perceived level of control in rebuilding lives? (2) What were the overall reactions of displaced survivors? (3) What sources of support were received and for what reasons?

Rationale and Significance

Over 15,000 people were displaced following one of the most devastating disasters which occurred in the southern U.S. and along the Gulf Coast. Lives were complicated by feelings of hopelessness and uncertainty. Much of the success of rebuilding lives and communities depends on survivors' attitudes and perceptions.

Methodology

Using a phenomenological design and a descriptive survey method, 15 subjects 18-75 years participated. A standardized personality survey was used to gather data pertaining to survivors' perception of their own locus of control (LOC). Interviews were used to gather data pertaining to overall reactions and perceived support systems.

Findings

Data collected indicated that there were no significant differences in scores based on age, ethnicity, educational background, or religion. Essential themes emerged related to overall reactions to the hurricane were: (1) fear and disbelief, (2) disrespect and abandonment, (3) uncertainty, (4) emotional stress, (5) grief and loss, and (6) hope and faith. Overriding themes emerged which related to sources of support received were (1) financial assistance, (2) employment agencies, (3) health services, and (4) housing assistance.

Conclusions

The majority of this sample had a sense of survival and a desire to help them selves move on with their lives. Findings further proved that there are needs of this population that provides health care providers with knowledge and understanding for planning future programs to assist disaster survivors.

JAMMING DURING SOCIAL INTERACTIONS IN *EIGENMANNIA VIRESCENS*

Sara K. Tallarovic, Ph.D., Erica Alfaro, Brad Wisdom, Eleanora Garcia

Purpose

The purpose of this project was to investigate whether glass knifefish, *Eigenmannia virescens*, electrically jam each other during social interactions.

Research Questions

Is jamming an aggressive behavior used to establish social dominance, and will *E. virescens* jam each other during social interactions?

Rationale/Significance

In any animal communication system there is a sender that transmits information through the environment to a receiver. Communication is typically considered as beneficial to both parties. If signals from two different senders interfere with each other, then jamming occurs. Most animals observed avoid jamming by modifying their communication behaviors. South American knifefish transmit a weak electrical signal into the environment used for their own navigation and for communication with conspecifics. Almost all electric fish species are thought to avoid jamming situations in which their electric organ discharge (EOD) frequencies might overlap and interfere with another fish or playback signal by performing the jamming avoidance response (JAR). JAR studies are typically performed using restrained fish, however. Recently we demonstrated that free-swimming brown ghost knifefish (*Apteronotus leptorhynchus*) actively jam rivals during certain social interactions, and furthermore will actively jam a playback signal mimicking a rival. Furthermore, the jamming behavior co-occurs with aggressive actions such as biting. We continued jamming studies using glass knifefish, *Eigenmannia virescens*, since adults are known to produce poor JARs in laboratory studies involving playbacks.

Methodology

Our study used free-swimming glass knifefish paired with a novel tank mate in a neutral territory. Behavior was recorded electrically and analyzed using an FFT to produce a spectrogram.

Findings/Conclusions

Most fish in our study changed their EOD frequencies to become closer in frequency to the fish they were paired with, although only several reached a jamming range. Those who did actively jam each other appeared to be mature males and displayed other aggressive behaviors (biting and chasing) during the interaction. These findings support our hypothesis that intentional jamming behavior may serve an aggressive function, and that it is more wide-spread in electric fish than previously thought. This study also underscores the importance of behavioral studies that allow for more natural interactions.

STUDENTS AT RISK FOR CARDIAC DISEASE: A PILOT INTERVENTION STUDY

Maureen Rauschhuber Ph.D., RNC, Sarah Williams, Ph.D., RN, BC, Jolynn Lowry, MSN, RN, Irene Gilliland, MSN, RN, Mary Elaine Jones, Ph.D., RN

Purpose

The purposes of this project are 1) to describe objective and subjective health risks for heart disease among college students participating in a required wellness course; 2) to describe the relationship between identified health risks, anger and spirituality, and 3) to determine whether interventions of anger management and spirituality reduce cardiac disease risk compared with students who receive the usual wellness curriculum.

Rationale and Significance

Risk factors for cardiovascular disease, now the leading cause of death in the United States, begin in youth. College students demonstrate an understanding of cardiac disease but lack insight into specific strategies that could modify their risk.

Methodology

Using a quasi experimental design with repeated measures, 165 (81 in study group; 84 in comparison group) fasting student volunteers completed the Self-Assessment of Health Risk Appraisal, the State-Trait Anger Expression Inventory, and the Spiritual Well-Being Scale. Objective measures included height, weight, body mass index, waist-hip ratio, blood pressure, and blood glucose and lipids. Data were collected near the beginning and end of the course and five months following course completion. Beginning in week 5 and continuing until week 13, the study group received information about metabolic syndrome, lifestyle issues, and anger management utilizing a cognitive behavioral approach.

Findings

Most of the students were single females of Hispanic background, with a mean age of 21 years. Half of subjects were overweight or obese; almost one-third had hypertension and 22% had cholesterol levels greater than 200 mg/dL. Groups did not differ at post measurement on levels of anger or spirituality. No significant differences between groups on subjective or objective measures due to class participation were found. Significant decreases occurred within groups over time for diastolic blood pressure, glucose, triglycerides and LDL. Scores on anger management indicated 41% required referral for anger management.

Conclusions

Lifestyle modification information for cardiac risk reduction is needed for young adults.

CATHOLIC SOCIAL TEACHING AND SEXUAL ETHICS

Julie B. Miller, Th.D.

Purpose

The purpose of this study is to explore how three historical shifts in the Catholic Church's teachings on sexual ethics have set a precedent for the possibility of a new, yet still Catholic, teaching on sexual ethics to be developed.

Research Questions

The question that will be explored is whether there exists a possibility of interweaving traditional, Natural Law sexual ethics with the principles of Catholic Social Teaching in order to create a new, contemporary Catholic sexual ethic that meets the needs of a world characterized by global climate change, HIV/AIDS, sexual violence against women and poverty.

Rationale/Significance

There is much evidence for this need. Catholic ethicists have done great work detailing an ethic concerned with social justice in the economic and political realms; protestant scholars have made great strides in elaborating the components of a sexual ethic which take issues of power and justice seriously. The challenge now is to find a way in which the best of both traditions can be utilized to define a specifically Catholic ethic of sexual justice, but one which also incorporates the best of the traditional, Natural Law ethic which has grounded the church's teaching for centuries.

Methodology

This study will utilize a methodology which investigates the issues of power, injustice, gender and sexuality in the current teaching on sexual ethics and how these limitations can be mitigated by the integration of principles of Catholic Social Teaching into it.

Findings/Conclusions

Preliminary work suggests that the way forward requires a thorough examination of what is meant by the concept of "human dignity" in regard to sexuality. It is only by fully exploring this concept of dignity—a concept upon which both Natural Law and Catholic Social Teaching rely—that we be able to develop a fully Catholic ethic of sexual justice.

IMPACT OF A PHYSICAL SCIENCES PROFESSIONAL DEVELOPMENT PROGRAM ON TEACHERS' CONTENT ENHANCEMENT AND CLASSROOM PRACTICES

Alakananda Ray Chaudhuri, Ph.D., Edward Gonzalez, Ph.D.

Purpose

The purpose of this study was to investigate the impact of UIW professional development program on engaging K-12 teachers in content-based critical thinking and problem solving activities in physical sciences and their constructivist teaching approaches in their classrooms.

Research Question

The research question that guided this study was to investigate how inquiry based professional development program impacted the extended inquiry instruction of science teachers in San Antonio area public schools by providing information that can be used both to improve the program during its implementation, and to judge the effectiveness of the program.

Rationale/Significance

Although the need for evaluating professional development programs is receiving increased attention, little has been done to examine the effectiveness of current practices. This study evaluates the UIW professional development program designed to improve student achievement by enhancing the content knowledge and instructional skills of the teachers.

Methodology

Qualitative and quantitative research methods were used to evaluate the program and comprised of three important components: analysis of content knowledge testing, classroom observation, and participant assessment of the program. The evaluation instruments include pre-post tests, journals, portfolios, group presentations, classroom observations, students' test scores, and participant assessment of the program.

Findings/Conclusions

One of the most significant findings of this study was the strong correlation between teachers' reported implementation of new knowledge and skills in the classroom and the impact on student learning outcomes. The comprehensive information obtained from participant test results, classroom observations, and participant program assessment show that this effort has had a profound affect on the teaching of physical sciences in middle schools. The assessment results clearly indicated participants' efforts to adapt new/alternative pedagogical strategies in their teaching to create a student-centered classroom.

CHEMICAL ANALYSIS OF MEDICINAL PLANTS USED IN THE TREATMENT OF TYPE II DIABETES

Alakananda R. Chaudhuri, Ph.D., Roel O. Flores, Edward E. Gonzalez, Ph.D.

Purpose

To study the chemical composition of medicinal plants used in folk medicine for the treatment of diabetes II.

Hypotheses

Medicinal plants that reduce blood sugar levels have the same chemical compounds.

Rationale

This research project aims to study the chemical composition of three commonly used plants for treating diabetes. The rationale is to determine chemical similarities between them in an effort to identify the active chemical components responsible for reducing blood sugar levels.

Methodology

Three anti-diabetic plants from Mexico were selected for study: *Cnidioscolus aconitifolius* (Miller), *Cecropia obtusifolia* Bertol (Cecropiaceae), and *Brickellia ell*, (Asteraceae), commonly known as "Chaya," "Changarro," and "Diabetina," respectively. The plant leaves were pulverized and 30 - 50 g samples were placed in cellulose thimbles and extracted successively in a Soxhlet apparatus with solvents of increasing polarity; (1) petroleum ether, (2) anhydrous diethyl ether, (3) chloroform, and (4) absolute ethanol, according to the Rosenthaler method. A 500 ml round bottom flask containing 320 ml of each solvent was attached to the Soxhlet apparatus for extraction. The solvent extractions were continued for twenty-four hours or until the solvent extracts were colorless. Separate plant samples were also extracted non-successively with dichloromethane (HPLC grade) and 320 ml of de-ionized water. All extracts were evaporated to dryness and the residues dissolved in anhydrous dichloromethane. Samples were concentrated, filtered, dried with anhydrous sodium sulfate and analyzed with a GC-MS.

Findings and Conclusions

Results of the GC-MS analysis indicated that Chaya and Changarro were more similar in composition than Diabetina. A recurrence of bicyclic compounds in the nonpolar extracts of Changarro and Chaya, but not Diabetina, indicate greater similarity between the two former plants. Chaya and Changarro had about seven times as many similar compounds than did Chaya and Diabetina or Changarro and Diabetina.

IRAQI REFUGEES IN JORDAN AND THE “CREATING ART, CREATING FRIENDSHIP” EXCHANGE

Sister Martha Ann Kirk, Th.D.

Purpose

This study sought information on why Iraqis are fleeing their homes and becoming refugees, the quality of life of the refugees, particularly the children, and what might be one to assist them.

Rationale/Significance

Catholic social teaching stresses the dignity of each human being, their basic human rights, and the importance of caring for the vulnerable. As we seek better relationships with other peoples of the world, especially peoples of the Middle East, we need to better understand their realities, enter into dialogue with them, and work for mutual respect.

Methodology

Before going to the Middle East, I read background on Iraqi refugees, and through groups and individuals got possible contacts in Jordan. In Amman, Jordan, we spent time with three church groups assisting the refugees, got information from the leaders, and saw and heard the refugees and photographed the children. This was integrated with reports on the situations of the refugees published by UNESCO, various NGO's, and aid groups.

Findings and conclusion

Over four million Iraqis are refugees and about half of them are children. This study gives some stories of the refugees' lives and their needs and hopes. They basically seek the necessities of life, respect, and safety from violence. Church groups assisting the refugees and parents of the children want the larger global community to know of their realities, and challenges. If we the people of the U.S. wish to develop good relationships with the Iraqi refugees, we need to listen to them more, and develop positive interchanges. One small way to develop better relationships is through exchanges of art and letters between children and youth. We have been developing means for these exchanges and invite participation.

COMPATRIOTS, FRIENDS AND BROTHERS: ROLE OF NETWORKS IN NEPALI MIGRATION TO SOUTH AND SOUTHEAST ASIA, 1900-2000

Lopita Nath, Ph.D.

Purpose of Study

The purpose of this study is to assess the role of migration networks in the continuing and sustained migration from Nepal to countries of South and Southeast Asia in the twentieth century. It also examines the role of these networks in encouraging migration flows, settlement and community formations in the country of destination.

Hypotheses

The hypothesis in this study rests on two points. First, Nepali migration in the twentieth century depended entirely on the networks established by the Gurkhas settled overseas which provided the migrants with support at various stages of their migration initiative. Second, these networks founded on the support of compatriots represent institutions of local origin, beyond caste and class barriers, which results in an enlargement and enrichment of the networks, as well as increasing migration flows.

Rationale and significance

This research raises important theoretical and methodological issues and also policy questions pertaining to the study of labor migration in the Asian context. The formation, role and the dynamics of the migration networks and their institutionalization underlines the importance of the historical analyses of the migration phenomenon.

Methodology

This study has been conducted using primarily the qualitative methods of historical research. Intensive participant observation and interviews have been used to study the community formation and settlement patterns of the migrants in the destination countries. Sample size and data have been used sparingly to support the qualitative evidence where necessary.

Findings and Conclusion

The Gurkha link has emerged as one of the strongest institutional networks in the countries of South and Southeast Asia. These networks enable adjustment in a new environment and a way out of their marginality. The dependence of the migrants on their networks for entrepreneurial support shows how these networks perpetuate migration and also create employment. Overall, the success of these networks can be evaluated by the continuation and sustenance of this movement for the past 200 years now.

FAMILY HISTORY: A VALUE ADDED PREVENTION AND SCREENING MEASURE FOR CARDIOVASCULAR DISEASE

Jeanette A. McNeill, Ph.D., RN, Jennifer Cook, MSN, RN, Marveen Mahon, RN, BSN,
Maureen Rauschhuber, Ph.D., RN, Mary Elaine Jones, Ph.D., RN

Purpose

To describe family health history profiles and objective indices of cardiac health among a sample of ethnically diverse working adults.

Significance

Family history (FH) of disease is an important predictor of individual health and may be one of the most cost-effective genetic assessments for health promotion/prevention for cancer and heart disease. Public lack of knowledge of FH and low clinician use prompted the US Surgeon General's Family History Initiative. Most study of FH knowledge has examined white populations; diverse populations have not been studied.

Methods

Descriptive design. Volunteers were recruited from staff in a private facility caring for elders. "My Family Health Portrait", a web-enabled program organized family history into a printable graphical representation. Blood pressure, height, weight, waist, hip measurements, as well as subjective measures of anxiety, spirituality and health status appraisal were obtained. Descriptive and correlational statistics were used in the analysis.

Findings

Of 44 participants, representing 52% of the employees, 89% were unaware of at least one piece of health/mortality data for the three generation pedigree. Over 25% had one or more first degree relatives (FDR) with cardiac disease, and in over half of these the heart disease was manifested at a younger age. Over two thirds had FDRs with diabetes. A large proportion of the sample exhibited objective indices of diabetes and cardiovascular risk including BMIs in the overweight or obese categories and BPs in the pre-hypertensive range.

Conclusions

Family history information was feasible to incorporate into health screening. Knowledge of their FH information coupled with objective risk factor information, enabled more appropriate health counseling for these employees.

Implications

More study of the effect of knowledge of family history is needed with diverse populations, as well as the professional use of this tool for health promotion/risk factor reduction in primary health care settings.

INTEGRATING THE QUALITY SAFETY EDUCATION FOR NURSES COMPETENCIES INTO A BACCALAUREATE NURSING CURRICULUM

Maria Gillespie MSN, RN, Julie Nadeau MSN, RN, Jeanette McNeill, Ph.D., RN, AOCNS, ANP-C

Purpose of study

The purpose of this project is to examine strategies to incorporate the QSEN competencies into a baccalaureate nursing curriculum.

Research Question

The research question that guided this study was “What is the students’ current knowledge and understanding of the QSEN competencies?”

Rationale and Significance

The Quality and Safety Education for Nurses (QSEN) project recommends six competencies, adapted from the 2003 Institute of Medicine recommendations for health professional education that entry-level nurses should possess in order to deliver safe, quality patient care. The competencies are patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics. The challenge to nursing programs is to analyze if and how we are teaching the knowledge, skills, and attitudes (KSAs) required for each competency, to develop strategies for teaching, and to share our findings (Cronenwett, et al., 2007). While faculty perceive that most competencies are taught, the students may not make the connections between the specific KSAs and the competencies. Faculty can teach the six competencies in a more effective and dynamic way.

Methodology

A pilot project evaluated students’ current knowledge and understanding of the competencies in third and fifth semester clinical courses through reflective journal assignments. Competencies were then incorporated into the student outcomes in the syllabi and clinical evaluation tools.

Preliminary Findings

Student acquisition of the KSAs for each competency was evaluated. Students easily identified safety and patient-centered care issues. Faculty assistance was required when examining aspects of the other competencies. This study is ongoing. Future recommendations include integration of the competencies throughout the curriculum and investigation of innovative methods by which to incorporate interprofessional education to promote teamwork and collaboration.

INTERLEUKIN-2 INDUCES THE ACTIVITIES OF DNA TOPOISOMERASE I AND DNA TOPOISOMERASE II IN HUMAN T CELLS

P. David Foglesong, Ph.D.

Purpose of study

To measure the activities of DNA topoisomerases in extracts prepared from human T cells after treatment with the growth factor, interleukin-2 (IL-2).

Hypothesis

IL-2 induces the activities of DNA topoisomerase I (Topo I) and DNA topoisomerase II (Topo II).

Rationale and significance

IL-2 is a protein growth factor that binds to a receptor on the surface of certain human white blood cells, the T lymphocytes. This binding activates biochemical pathways that result in increased gene expression and DNA replication, processes in which DNA topoisomerases are believed to be required.

Methodology

T cells were treated with IL-2, and extracts of the cell nuclei were prepared at various times after treatment. The extracts were assayed for the activity of Topo I by relaxation of supercoiled DNA and for the activity of Topo II by unknotting of knotted DNA. The concentrations of protein in the nuclear extracts were determined, and the specific activities of Topo I and Topo II were calculated.

Findings

The specific activities of both Topo I and Topo II increased 10-fold to 20-fold after treatment of cells with IL-2.

Conclusions

IL-2 dramatically induces the activities of both Topo I and Topo II. The times of increased specific activities of both enzymes coincide with periods of increased gene expression (0.5 – 4 hours) and increased DNA replication (12 hours) in HuT 78 cells following treatment with IL-2. These results suggest that Topo I and Topo II function in both gene expression and DNA replication in IL-2-activated human T lymphocytes.

THE TRAGEDY OF THE RIVERS: BUILDING AUTHORITY OVER THE BRITISH WATER ENVIRONMENT

Kevin B. Vichcales, Ph. D.

Purpose

The study investigates the problem of rivers as common public resources.

Research Questions

a) How does an advanced industrial society respond to the challenge of providing a healthy water environment to their citizens; b) What are the primary factors leading to success or failure; and c) What does the British experience suggest for other nations?

Rationale/Significance

Viewed historically, the problem of environmental water pollution control in Britain has been the establishment of regulating authority over aspects of nature that are regarded simultaneously as economic resources, public utilities, and public amenities. Legislators, subject to pressure from industrial polluters, political parties, and advocates for environmental quality, sought at different times to locate authority at local, regional, national and extra-national levels. However, each effort failed to resolve the issue of authority over the environment, because administrative solutions merely shifted the pollution elsewhere.

Methodology

Historical method analyzing primary and secondary sources.

Findings/Conclusions

Three themes are evident from the study: a) the struggle to define the appropriate level at which authority over the water environment was vested; b) the structural failure of multi-purpose regional water authorities, whom were both regulator and polluter, to effectively protect the river common; c) how advocates used scientific and technical knowledge as a “neutral authority” to bolster their positions, even though such knowledge is tentative, conditional, and subject to change. Lastly, natural ecosystems (river basins/watersheds) provided a geographical and regulatory framework for integrated resource management and pollution control. However, the British experience suggests that such natural frameworks must be matched with regulatory bodies imbued with sufficient powers to effectively protect common resources. For Britain, this remained a challenge for the future.

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