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# *Sabbatical Proposal*

## *Greg Crow, Ph.D.*

### *Proposed Program of Study*

The Church of the Nazarene faces challenges maintaining a qualified ministerial corps. The factors that contribute to the persistent service of ministers in our congregations deserve thorough study and cannot be adequately addressed with one or two simple questions, although the central research question of this proposal frames the challenge as follows:

#### **What are the major risk factors for attrition among ministers serving in the Church of the Nazarene?**

The search for these risk factors will be done within the data maintained by the General Secretary of the Church of the Nazarene. The local church database and the pastors' database will be combined in order to perform several types of multivariate analysis. The central research question can be answered if a useful mathematical model can be constructed to predict retention rates for individuals possessing a certain constellation of risk factors.

### *Interest*

As a mathematician, my interest in this work lies in the Linear Algebra that gives the foundation to multivariate statistical analysis. This project does not propose to add any understanding to the field of pure mathematics, nor to the field of statistics.

My need for further formal training and experience as a statistician becomes more and more apparent to me as I continue to teach statistics courses to mathematics majors and to students in the social sciences and nursing. I have been asked to serve on three

Research that has been performed on the pastoral data set suggests that educational preparation may be a potential factor. Other factors may include the pastor's income, number and ages of children, size of the congregation and growth patterns in the church. The variables stored in the databases are too numerous to list, but part of the sabbatical will involve a review of the literature to narrow the scope of the investigation to a manageable level.

Conventional wisdom supposes a typical career path for pastors. Such wisdom supposes a successful pastor will advance to larger churches based on the ability to increase the numerical membership growth in each church assignment; conversely, individuals who fail to experience growth in their churches eventually opt out of the field. While this may or may not be true, I contend that such experience certainly does not constitute the whole story of pastoral success or failure.

graduation with distinction projects which had a heavy statistical component and to give statistical help to two faculty members and one faculty spouse on their doctoral dissertations. In these instances, I have desired more extensive practice and background in statistics.

As an active member of the Church of the Nazarene, I am interested in the wellbeing of pastors and of the church.

### *Benefits*

The benefits of work resulting from this sabbatical study will include my professional development as outlined above, a closer link with the church on the issue of training ministers, and perhaps a contribution to the field of Sociology of Religion. The direct

benefit to my teaching will be in the courses *Introduction to Statistics* MTH 203, *Mathematical Statistics* MTH 364 and *Linear Algebra* MTH 404.

## **Larger Long Term Study**

The Church of the Nazarene, through its Church Growth Division, is engaged in a number of ongoing research agendas. My proposed study, while not yet part of any larger study, meshes well

with their interests in ministerial preparation and with the needs of the local church.

## **Schedule**

Spring and Summer of 1999:

Two to three weeks spent doing the literature review for this project.

Spring of 2000:

I will begin the tedious task of cleaning up and linking the two databases using ACCESS, EXCEL, and SPSS. If time permits, ArcView geographical information will be folded into the merged database. The next step is to begin the analysis using SPSS.

Concurrently, I will be reading portions of the theoretical statistics books listed in the bibliography.

The final task will be to write a brief paper to explain the SPSS output.

Spring 2001

I plan to present the results at the March meeting of the Association of Nazarene Sociologists of Religion (ANSR).

## **Proposed Course Work**

No formal course work is envisioned.

## **Foreign Languages**

Fluent in ACCESS, EXCEL, and SPSS, I have more than 15 years of experience in the latter. The ability to converse well in all three

languages allows me to transform data in ways that most users cannot.

## **Academic Goals**

This project is an exact fit with one of the two academic goals listed in my tenure portfolio:

I have participated in data gathering and analysis within the field of sociology since college and I am interested in the theoretical and practical side of statistical analysis. The lectures that Steve Hobbs has been giving to the

math faculty have whetted my appetite by giving a glimpse of the Linear Algebra that underlies linear regression and will lead to ANOVA. I suspect that my first sabbatical proposal will involve this area.

Becoming a more well read scholar, the other goal listed in my portfolio, continues, alas, to be a slow process.

## **Foreign Travel**

I plan to travel to Europe during the sabbatical, despite the fact that I cannot concoct any way in which it could plausibly

be related to this project. The cover sheet does not request financial support for this travel.

## **Bibliography**

### **Mathematical Statistics Books**

Anderson, T. W. *An Introduction to Multivariate Statistical Analysis*. New York: Wiley, 1984. (519.535 A5511)

Fahrmeir, L. *Multivariate Statistical Modeling Based on Generalized Linear Models*. New York: Springer-Verlag, 1994. (519.535 F158m)

Harville, David A. *Matrix Algebra From A Statistician's Perspective* New York: Springer-Verlag, 1997. (512.5 H342m)

Rao, C. Radhakrishna *Linear Models: Least Squares and Alternatives*. New York: Springer-Verlag, 1995. (512.5 R215L)

Ryan, Thomas P. *Modern Regression Methods*. New York: Wiley, 1997. (519.536 R989m)

Scheffe, Henry *The Analysis of Variance*. New York: Wiley, 1959 (519.9 S316a)

Seber, G. A. F. *Linear Regression Analysis* New York: Wiley, 1977. (512.5 S443L)

Seber, G. A. F. *Nonlinear Regression* New York: Wiley, 1989. (519.536 S443n)

## **Papers**

Association of Nazarene Sociologists of Religion Archives  
<http://www.olivet.edu/Church/Growth/author.html>

*United Methodist Clergywomen Retention Study*

Lynn Scott, General Board of Higher Education and Ministry

## **Databases stored in the Lilley Endowment's Archives**

<http://www.arda.tm/>

A study of the careers of Presbyterian Seminary Graduates

<http://www.arda.tm/archive/APTI.html>

## **Books on Clergy Retention**

Jackson W. Carroll: *Too Many Pastors? The Clergy Job Market*  
(Being extended by Patricia Chang, University of Notre Dame)

Paula D. Nesbitt: *Feminization of the Clergy in America: Occupational and Organizational Perspectives* (ISBN: 0195106865)

Candace Reed Benyei: *Understanding Clergy Misconduct in Religious Systems: Scapegoating, Family Secrets, and the Abuse of Power* (ISBN: 0789004526)

## **Software Manuals**

Getting to Know ArcView® GIS: the geographic information system (GIS) for everyone™ (ISBN 186242019X)

SPSS-X User's Guide, 3<sup>rd</sup> edition (ISBN 013177817X)

# **Curriculum Vitae**

## **Education**

**Ph.D.** University of Notre Dame (South Bend, IN)  
"Some Results on Complete Minimal Surfaces"  
Pure Mathematics (Differential Geometry) — January, 1990

**M.S.** University of Notre Dame  
Pure Mathematics — May 1986

**B.A.** Mid-America Nazarene College (Olathe, KS)  
Mathematics and Computer Science — May 1984

## **Academic Honors**

### **University of Notre Dame**

Arthur J. Schmitt Foundation Dissertation Year Fellowship  
First year fellowship  
(Both included full tuition and a stipend for living expenses)

### **Mid-America Nazarene College**

Valedictorian  
Summa Cum Laude  
Phi Delta Lambda (Nazarene Honor Society)  
American Heritage Award (The highest non-academic award given to a graduating senior. The award, made by faculty election, was based upon campus citizenship, spiritual vitality, and all-around contribution to the College. – MANC Catalog)

## **Presentations and Publications**

Paper (with Ron Benefiel)  
"Beliefs, Attitudes and Norms of Students on Nazarene College and University Campus: Then and Now"

Annual Meeting of the Nazarene Sociologists of Religion  
<http://www.olivet.edu/Church/Growth/ansr3-98a.html>

*Faculty Demonstrations of Teaching Applications*  
ICCUFA at Biola University

Abstracts  
Eight reviews of research articles published in  
*Mathematical Reviews*.

### Journal Article

"On a Conjecture of Nitsche,"  
*Proceedings of the American Mathematical Society*

### Colloquium Talk

*On Minimal Surfaces*  
Cleveland State University

## **Employment**

### **Point Loma Nazarene University**

Associate Professor 1995 to Present  
Assistant Professor 1992-95  
Tenured 1998

### **John Carroll University** (Cleveland, OH)

Assistant Professor 1989-92

### **University of Notre Dame**

Teaching Assistant/Fellow 1984-89

## **University Committees**

### **Committee on Committees** (Chair)

Jointly restructured the committee system and helped guide it through the faculty and the cabinet.

### **Computer Committee**

Served on the sub-committee that created the policy that software with a 1/3 market share may be supported by ITS.  
(i.e. WORD and EXCEL were welcomed and supported.)

Served on the sub-committee that supervised the design of the PLNU home page and the hiring of the web-site coordinator.

### **Professional Development** (Faculty Council Representative)

Helped design new faculty evaluation forms.

### **WASC Committee on Library, Computer, etc.**

Performed a statistical analysis of PLNU departmental holdings versus course hours offered.

Compared PLNU library expenditures to other schools based on the "Survey of Academic Libraries" compiled by John Minter and Associates based on the IPEDS data.

#### **Sub-committees**

Various formal and informal assignments usually dealing with technology issues.

### **Departmental Responsibilities**

Each year responsibilities change, but over the years my involvement has included:

- editing, scoring and distributing the results of the math placement test
- organizing the departmental chapel programs
- working on departmental review including curricular revision
- leading the charge on pedagogical changes in teaching calculus and statistics
- lecturing in our weekly faculty mathematics seminar
- drafting new floor plans for the proposed Rohr Science 2<sup>nd</sup> floor south remodeling

### **Inter-departmental Activities**

#### ***Participant in***

Social Science Research Group

This group is concerned with research methodology, research literature, question design, and statistical analysis.

Science and Theology Discussion Group

We have read Polkinghorne, Murphy, Dennet, Behe, Ferris, Barth, and others.

#### ***Guest lecturer in***

PSY 101 Psychology of Personal Development  
"Who Writes Your Story?" (8 semesters)

BIO497 BIOLOGY SEMINAR

"The Nature of Chance"

POL345 THE MODERN STUDY OF WAR

"Analyzing the Correlates of War Data using SPSS"

BIO 300 Biomathematics and Bioinformatics

Possible future lectures and/or team teaching.

Seminar on Wesleyan Theology for the 21st Century  
*Integration of Faith and Learning in Mathematics?*

Board of Trustees–Academic Affairs Committee  
A Tour of the Web

### **Creative Endeavors**

The Forms Central Project  
Blue Academic Year Calendars  
Advising Guides for Several Departments  
Class Lists and Advising Information on the Web  
Spreadsheet for the Registrar to Assign Rooms  
Automation of the Survey for Committee Assignments  
Documentation on operating a list server  
Documentation on SPSS for a History class

### **Church and Community Service**

I summarized the statistical findings of a paper from *The Journal of Economic Entomology* that was distributed to all homeowners in our complex. The Board of Directors invited me to give a presentation to the homeowners in our 220-unit community. The ballot measure passed and the CC&R's (covenants, codes and regulations) now include termite eradication as a homeowners' association responsibility.

I serve on a national subcommittee of the MAA that creates, reviews and edits an extremely challenging 30 question test for high school students. More than 400,000 students take the test every year. It is the first rung in the selection of our national team for the International Mathematics Olympiad. My second three-year appointment ends in the Spring of 2001.

I analyzed the data from the "Congregational Worship Survey" at Mission Valley Church of the Nazarene.

Teen Bible Quizzing on the Southern California District:

Official for monthly district contests (4 years)

Co-director for district contests (2 years)

Regional Activities Days (RAD) Quizmaster (3 years)

I have been an usher for 4 years (Team leader)

I served on the Pre-school Study Committee.

I give statistical advice to our pastoral staff. They are now convinced that they cannot report a divorce rate of 50% from the platform (it's less than 40% for first marriages).

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### **Technical Details**

Cleaning up a database involves converting a file from its ACCESS version into an SPSS file format. A few runs of descriptive statistics on the variables in question allow the user to label data as "system-missing" when it clearly and unmistakably contains data entry errors. The data then goes back into ACCESS and/or EXCEL to build a useable file structure either of one record per year for each pastor or into one record per pastor per assignment. There are subtleties even at this level since the pastors' database may have more than one assignment per church (ordination for instance). Within each record there need to be variables from both databases and this linking of records will be done in ACCESS. Each record should contain as many of the following variables as is possible: age, gender, church attendance (Sunday a.m.), attendance growth rate, educational training, number of years since training, age of oldest child, pastor's income, total raised for all purposes by the church, city size, and education level of the surrounding community. The last two variables will be added, if time permits, with the geographic information system (GIS) software called ArcView®.

The analyses that will be conducted are Frequencies, Crosstabs, ANOVA, MANOVA, Regression, Multiple Regression, and perhaps Factor Analysis.