AD 735 905

DEVELOPMENT AND PRESENTATION OF A NATIONAL WAR COLLEGE ELECTIVE COURSE TO DEMONSTRATE THE USE OF QUANTITATIVE TECHNIQUES IN THE STUDY OF INTERNATIONAL RELATIONS
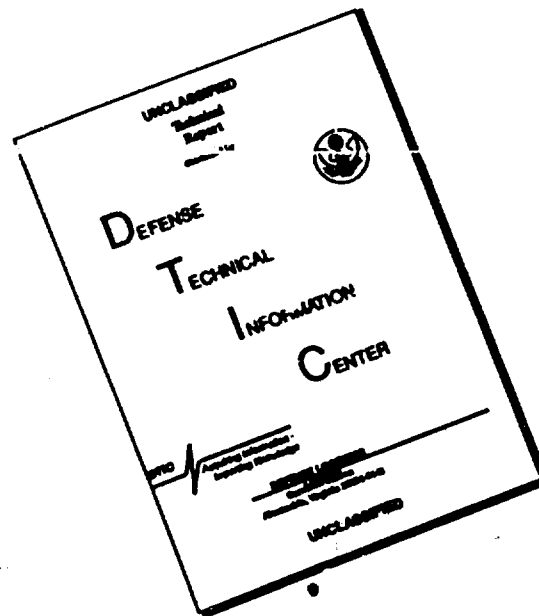
FINAL REPORT

CONSOLIDATED ANALYSIS CENTERS INC.

DISCLAIMER NOTICE

DEFENSE TECHNICAL INFORMATION CENTER

THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION
Consolidated Analysis Centers Inc. 1815 N. Fort Myer Drive Arlington, VA. 22209	Unclassified
	2b. GROUP Not Applicable

3. REPORT TITLE

Development and Presentation of a National War College Elective Course to Demonstrate the Use of Quantitative Techniques in the Study of International Relations

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Technical Report

5. AUTHOR(S) (First name, middle initial, last name)

W. W. Fain, et al.

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
September, 1971	263	170

8a. CONTRACT OR GRANT NO. DAHC 15 70C 0263	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO. P00002 and P00003	Not Applicable
c.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d.	Not Applicable

10. DISTRIBUTION STATEMENT

This document has been approved for public release and sale; its distribution is unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
Not Applicable	Behavioral Sciences Office Advanced Research Projects Agency Arlington, Virginia 22209

13. ABSTRACT

A course to demonstrate the use of quantitative techniques in the study of international relations was designed and presented as an experimental elective at the National War College. This report describes the course, presents a student and faculty critique of the course and assembles a package of course materials which can be used by other schools and organizations for aid in the presentation of a similar course.

The package of materials (three volumes) includes:

1. Overview of the course and a syllabus.

2. Two student workshop manuals: one for data-file analysis and the other for simulation.

3. A set of materials for the instructor's use in preparing and giving the course.

DD FORM 1473 REPLACES DD FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Quantitative Techniques						
Quantitative International Relations						
Data-files						
Simulation						
National War College						
Computer Time-Sharing						
Computer Soft-Ware						
Games						
Education						

TABLE OF CONTENTS

ABSTRACT

COURSE PARTICIPANTS

PROJECT SUMMARY

ATTACHMENTS

ABSTRACT

A course to demonstrate the use of quantitative techniques in the
study of international relations was designed and presented as an
experimental elective at the National War College. This report
describes the course, presents a student and faculty critique of the
course and assembles a package of course materials which can be
used by other schools and organizations for aid in the presentation of
a similar course.

The package of materials (three volumes) includes:

1. Overview of the course and a syllabus.

2. Two student workshop manuals: one for data-file
   analysis and the other for simulation.

3. A set of materials for the instructor's use in
   preparing and giving the course.

COURSE PARTICIPANTS

The following people contributed to the development and presentation of the course and participated in the preparation of the report and the "Package Course" development. Most people contributed in many ways, the listed roles are only the primary ones.

Study Director and Course Coordinator   Dr. William W. Fain, C. A. C. I.

Course Director for the National War College   CDR E. A. Parent, SC, USN National War College

Course Director for Data File Analysis   Dr. Robert Young, C. A. C. I.
Assistant   Mr. James Moore, C. A. C. I.

Course Director for Simulation   Dr. Janice Fain, C. A. C. I.
Assistant   Mrs. Bonnie Ayres, C. A. C. I.

LECTURERS AND CONTRIBUTORS

Dr. Robert Young, C. A. C. I.
Dr. Janice Fain, C. A. C. I.
CDR E. A. Parent, National War College
Professor John Sullivan, Yale University
Professor Jeffrey Milstein, Yale University
Professor William Coplin, Syracuse University
Professor Michael O'Leary, Syracuse University
Mr. James Moore, C. A. C. I.
Professor Davis Bobrow, University of Minnesota
Mrs. Bonnie Ayres, C. A. C. I.
Mr. Michael Daniels, C. A. C. I.
Miss Vivian Schwartz, C. A. C. I.

PACKAGE COURSE EDITORS

Dr. Janice Fain, C. A. C. I.
Mrs. Bonnie Ayres, C. A. C. I.

CONSULTANTS

Professor Charles McClelland, University of Southern California
Professor Harold Guetzkow, Northwestern University
Professor Raymond Tanter, University of Michigan
Professor Charles Taylor, Virginia Polytechnic Institute

PROJECT SUMMARY

In June 1970, Consolidated Analysis Centers Inc. began an ARPA-sponsored study of how computers might be used to aid the educational program of the National War College.* Growing out of that study was the concept of an elective course to demonstrate, in a realistic classroom setting, the use of quantitative techniques in the study of international politics — a subject area representing about 90 percent of the National War College curriculum.

This course on quantitative techniques in the study of international relations was designed and presented as an experimental elective to a small group of National War College students and faculty from February 12 to April 16, 1971. In addition to students from the National War College several other government agencies including the Army War College, State Department, Naval Academy and the Defense Intelligence School had representatives who attended one or more sessions.

Based in part on the materials developed for the National War College course, a package of materials has been assembled for use by other schools and organizations for aid in the presentation of a similar course.

The substance of the final report on this course is contained in four attachments:

- The Syllabus of the experimental elective course "Quantitative Techniques in International Relations" given at the National War College

- The student critique of the course

- Memorandum for the Commandant

- The package of course materials.

---

*"Computer Applications and Implementation Study for the National War College," Vols. I-III, Consolidated Analysis Centers Inc., January 1971.

The first three attachments are bound with this final report. Because
of its bulk (three volumes) and its wider distribution, the package of
course materials is bound separately. It will be distributed to the major
service schools including the war colleges and service academies.

The Syllabus of the National War College Course

The syllabus includes the planned scope of the course, definition of the
purpose, the relationship to the National War College curriculum and
a description of the course organization as well as of each of
the topics.

In general, the actual delivery of the course followed the plan contained in
the syllabus. The variations which occurred were mainly due to scheduling
difficulties because of conflicts with other college activities.

The Student Critique

At the beginning and end of the course a questionnaire was distributed to
the students to collect information on the groups background and level of
knowledge and their evaluation of the course and their attitudes on the use of
quantitative methods.

These statistics are included and discussed in the student critique.

The Memorandum for the Commandant

This memorandum embodies the (NWC) Course Director's evaluation of the
course and his recommendations. It discusses the course objectives and an
evaluation of how well these were met by the course. It evaluates the interactive
version of the PRINCE model which was developed specifically for the course,
the materials and overall organization of the course and quality of instruction.
Continued sponsorship of the course is recommended to the college.

The Package of Course Materials

This three volume set of materials presents those parts of the course development which could be used by other service schools to put on a similar course.

- Volume I. Includes an overview of the course and a syllabus which builds on the experience of the National War College course and on an analysis of the curricula of other major service schools.

- Volume II. Includes the two students workshop manuals: Student Manual for Data-File Analysis and Student Manual for Simulation.

- Volume III is a set of materials for the instructor's use in preparing and giving the course. It includes a set of lecture notes, a set of newspaper clippings to support the simulation and an instructor's manual for the data-file analysis and simulation.

ATTACHMENT I

ELECTIVE COURSE SYLLABUS

THE NATIONAL WAR COLLEGE

A PROPOSED

ELECTIVE COURSE SYLLABUS

QUANTITATIVE METHODS

IN

INTERNATIONAL RELATIONS

12 February - 16 April

Course Director;
CDR E. A. Parent SC, USN

Course Coordinator;
Dr. William W. Fain, C.A.C.I.

PROPOSED

ELECTIVE COURSE

****

QUANTITATIVE METHODS IN INTERNATIONAL RELATIONS

12 February 1971 - 16 April 1971

****

A - SCOPE OF THE COURSE

1.   Purpose.

       To provide through lectures, seminar discussions, work sessions with
computer-based methods and assigned readings:

       - An understanding oi quantitative methods of analysis as they are employed
in studies of international affairs.

       - A familiarity with existing theories in international politics that are
relevant to empirical research.

       - The opportunity to use data analysis and computer simulation in the
exploration of selected policy-relevant problems.

2.   Scope.

       The course will deal with three general subjects:

       - Overview of the quantitative approach to international politics.

       - The use of quantitative data and statistical techniques in the investigation
of foreign policy problems.

       - The use of models and simulations in the study of international politics.

3.   Relationship to the Curricular Theme.

       This elective supplements the prescribed courses dealing with inter-
national politics.

4.   Conduct of Elective Course.

       The group will meet for 24 sessions, three times a week from 12 February
through 16 April, 1971.   The meetings will last from 1 1/2 to 2 hours.   The
specific time and place of meetings will be shown in the weekly schedule.

5.   Elective Course Readings.

Readings have been listed as "Required," "Additional" and "Optional."
Copies of all required readings will be distributed to each student. Copies of
additional and optional readings will be on a special shelf in the library.

INSTRUCTORS AND AFFILIATIONS

Mrs. Bonnie Ayres, C. A. C. I.

Professor William Coplin, Syracuse University

Dr. Janice Fain, C. A. C. I.

Dr. William Fain, C. A. C. I.

Professor Jeffrey Milstein, Yale University

CDR E. A. Parent, National War College

Dr. John Sullivan, Yale University

Dr. Robert Young, C. A. C. I.

Mr. Jim Moore, C. A. C. I.

****

B - ORGANIZATION OF THE COURSE

Topic
and
Date   Speaker

WEEK 1: INTRODUCTION TO INTERNATIONAL RELATIONS AND
QUANTITATIVE TECHNIQUES

1 Feb. 12	Overview of the field of International Relations: Theories and Methodology	Dr. Jeffrey Milstein
2 Feb. 16	Concepts of National Power; Introduction to Data-Files; Descriptive Statistics	Dr. John Sullivan CDR E. A. Parent
3 Feb. 17	Instruction in the Use of Terminals; Description of the Data-Files and Statistical Programs Available for Student Use	Dr. Robert Young

WEEK 2: QUANTITATIVE EXAMINATION OF THE PROBLEM OF INTER-
NATIONAL CONFLICT

4 Feb. 22	Regression and Curve Fitting Methods; Theories of Conflict: Its Causes and Consequences; Middle-East Conflict Problem	CDR E. A. Parent Dr. Robert Young Dr. Jeffrey Milstein
5 Feb. 23	Additional Statistical Techniques: Cause- Effect, Scatter Plots, Measures of Association, Continuation of Conflict Problem	CDR E. A. Parent Dr. Robert Young
6 Feb. 24	Team Approaches to Conflict Problem Continued Class Work on Conflict Problem	Dr. Jeffrey Milstein

WEEK 3: PRESENTATION OF ADDITIONAL QUANTITATIVE TECHNIQUES

7 March 1	Statistical Estimation Methods; Research Design; Hypothesis Testing Methods	CDR E. A. Parent Dr. Robert Young
8 March 2	Continued Class Work on Conflict Problem	Dr. Robert Young

| 9
March 3 | Presentation and Evaluation of Student
Results on the Conflict Problem; Case
Studies in Conflict: Vietnam, Cuba,
World War I | Dr. Robert Young |

WEEK 4: THEORIES OF ALLIANCE FORMATION AND THE USE OF QUANTITATIVE TECHNIQUES

| 10
March 8 | Discussion of Theories of Alliance
Formation; Class Problem on Alliances:
Comparison of the Reaction of NATO
Countries to the Czech Crisis with that
of the Warsaw Pact Countries | Dr. John Sullivan |

| 11
March 9 | Class Work on Alliance Problem | Dr. Robert Young |

| 12
March 10 | Presentation and Evaluation of Student
Results on Alliance Problem; Case
Study in Alliance Formation: NATO | Dr. John Sullivan |

WEEK 5: EMPIRICALLY DERIVED MODELS

| 13
March 22 | Multiple Step-wise Regression;
Presentation and Critique of
Student Models | CDR E. A. Parent
Dr. John Sullivan |

| 14
March 24 | Empirical Models: Their Development
and Use; Presentation of an Empirically
Derived Conflict Model of Vietnam: Its
Derivation, Validation, and Use | Dr. Jeffrey Milstein |

| 15
March 25 | Class Work with the Vietnam Model | Dr. Jeffrey Milstein |

WEEK 6: JUDGMENTAL MODELS

| 16
March 29 | Introduction to Simulation and
Judgmental Model Building. Class
Play of NEXUS | Dr. William Fain
Dr. Janice Fain
Mrs. Bonnie Ayres |

| 17
March 30 | Student Critique of NEXUS;
Presentation of PRINCE | Mrs. Bonnie Ayres
Dr. William Coplin
Dr. Janice Fain |

| 18
March 31 | Class Play of PRINCE
Critique of PRINCE | Dr. Janice Fain
Dr. William Coplin |

WEEK 7: PRESENTATION AND SOLUTION OF A GENERAL CLASS PROBLEM

19 April 5	Review of Quantitative Techniques Class Problem	CDR E. A. Parent Dr. Robert Young
20 April 6	Classwork on Problem	Dr. Robert Young
21 April 7	Presentation and Discussion of Solutions to Class Problem	Dr. Jeffrey Milstein

WEEK 8: SUMMARY AND EVALUATION OF THE COURSE

22 April 12	Review of Theories of International Affairs: Past Contributions of Quantitative Methods	Dr. John Sullivan
23 April 15	Critique of Class Activities	Dr. Jeffrey Milstein
24 April 16	Current Trends in Quantitative International Relations; Student Critique of the Course	CDR E. A. Parent Dr. Robert Young Dr. William Fain

C - DETAILED DESCRIPTION*

WEEK 1: INTRODUCTION TO INTERNATIONAL RELATIONS AND QUANTITATIVE TECHNIQUES

TOPIC 1

****

February 12, 1971: CDR E. A. Parent, Dr. Jeffrey Milstein

1. Scope.

   - Introduction to the Course and Its Instructors

   - Overview of the Field of International Relations: Theories and Methodologies

2. Required Readings.

   COMPUTERS AND THE POLICY-MAKING COMMUNITY, Davis Bobrow and Judah Schwartz, eds. (Prentice-Hall, 1968, Chapter 1 (Bobrow and Schwartz), Chapter 6, pp. 81-86 (Bobrow)

3. Additional Readings.

   a.   INTERNATIONAL POLITICS AND FOREIGN POLICY, revised edition, James Rosenau, ed. (Free Press, 1969).   Chapter 1 (Charles McClelland), Chapter 2 (E. Raymond Platig).

   b.   COMPUTERS AND THE POLICY-MAKING COMMUNITY, Chapter 6, pp. 87-110.

*Discussion Agenda to be distributed during the course.

TOPIC 2

****

February 16, 1971: Dr. John Sullivan, CDR F. A. Parent

1. Scope.

   - Discussion of the Concepts of National Power (Review factors presented in Course II)

   - Introduction to the Data File Concept: The Collection, Organization Retrieval, and Use of Data

   - Descriptive Statistics

2. Required Readings.

   INTERNATIONAL POLITICS AND FOREIGN POLICY, Chapter 44 (Karl Deutsch)

   HUMAN BEHAVIOR AND INTERNATIONAL POLITICS, J. David Singer, ed. (Rand McNally 1965), Chapter 3 (Robert A. Dahl).

3. Additional Readings.

   COMPARING NATIONS, Richard L. Merritt and Stein Rokkan, eds. (Yale University Press), Chapters 2, 4, 5, 6.

   INTERNATIONAL POLITICS AND FOREIGN POLICY, Chapter 24 (Karl Deutsch)

4. Optional Readings.

   DATA PROCESSING, Kenneth Janda, ed. (Northwestern University Press 1965), Chapter 2.

TOPIC 3

****

February 17, 1971: Dr. Robert Young

1. Scope.

   - Instruction in the Use of the Terminals

   - Description of the Data-files and Statistical Programs Available for Student Use

   - Work Session: Examination of Data-files by the Students via the Terminals

2. Required Readings.

   (Parent Handout)

3. Additional Readings.

   COMPARING NATIONS, Chapter 22 (Harold D. Lasswell).

   FOUNDATIONS OF BEHAVIORAL RESEARCH, Kerlinger (Holt, Rinehart and Winston), Chapters 1-3.

QUANTITATIVE EXAMINATION OF THE PROBLEM OF
INTERNATIONAL CONFLICT

TOPIC 4

* * * *

February 22, 1971: CDR Parent, Dr. Young, Dr. Milstein

1. Scope.

- Presentation of Regression and Curve Fitting Methods including Lagged
Relationships.

- Discussion of Theories of Conflict: Its Causes and Consequences

- Mid-East Conflict Problem

2. Required Readings.

Parent Handout

Milstein Papers

THEORY AND RESEARCH ON THE CAUSES OF WAR, Dean G. Pruitt and
Richard C. Snyder (Prentice-Hall, 1969), Chapter 11 (R. Naroll).

3. Additional Readings.

INTERNATIONAL POLITICS AND FOREIGN PCLICY, Chapter 57 (Charles
McClelland and Gary Hoggard).

NEW APPROACHES TO INTERNATIONAL RELATIONS, Mortor. A. Kaplan, ed.
(St. Martin's Press), Chapter 9 (Robert C. North).

FROM WAR TO WAR, N. Safran (Pegasus), Chapters 1, 3, 4, 5.

WEAPONS SYSTEMS DECISIONS, Davis Bobrow, ed. (Praeger),
Chapters 1, 3, 4.

4. Optional Readings.

THEORY AND RESEARCH ON THE CAUSES OF WAR, Chapter 16
(R. Rummel).

4

TOPIC 5

****

February 23, 1971: CDR Parent, Dr. Young

1. Scope.

   - Additional Statistical Techniques: Cause-Effect, Scatter Plots,
   Measure of Association

   - Work Session: Class Work on Conflict Problem

2. Required Readings.

   Parent Handout

   APPROACHES TO MEASUREMENT IN INTERNATIONAL RELATIONS,
   John Mueller, ed. (Appleton-Century-Crofts), Chapter 2 (Bruce M. Russett;
   also in Journal of Conflict Resolution, June 1963), Chapter 7 (Ole R. Holsti;
   also in American Political Science Review, June 1965).

3. Additional Readings.

   READINGS ON THE INTERNATIONAL POLITICAL SYSTEM, Naomi Rosenbaum,
   ed. (Prentice-Hall), Chapter 11 (Clinton F. Fink), Chapter 12 (Anatol Rapoport).

TOPIC 6

****

February 24, 1971: Dr. Milstein

1. Scope.

    - Class Discussion on Team Approaches to Conflict Problem

    - Work Session: Class Work on Conflict Problem

2. Required Readings.

    JOURNAL OF CONFLICT RESOLUTION, "The War of All Against All,"
E. Converse, December 1968, pp. 471-475, 531-533; skim 475-530.

3. Additional Readings.

    SOCIAL PROCESSES IN INTERNATIONAL RELATIONS, Louis Kriesberg,
ed. (John Wiley and Sons), Chapter 7 (Amitai Etzioni).

    NEW APPROACHES TO INTERNATIONAL RELATIONS, Chapter 2
(A. Wohlstetter)

WEEK 3: PRESENTATION OF ADDITIONAL QUANTITATIVE TECHNIQUES

TOPIC 7

****

March 1, 1971: CDR Parent, Dr. Young

1. Scope.

   - Presentation of Statistical Estimation Methods

   - Discussion of Research Design

   - Hypothesis Testing Methods

2. Required Readings.

   RESEARCH METHODS IN SOCIAL RELATIONS, Selltiz, et. al. (Holt, Rinehart and Winston), Chapter 2.

TOPIC 8

****

March 2, 1971: Dr. Young

1. Scope.

   - Work Session: Class Work on Conflict Problem

2. Required Readings.

   THEORY AND RESEARCH ON THE CAUSES OF WAR, Chapter 10
   (John Raser and Wayman Crow), Chapter 15 (C. Osgood).

3. Additional Readings.

   WEAPONS SYSTEMS DECISIONS, Davis Bobrow, Chapters 2, 7, 8.

4. Optional Readings.

   HUMAN BEHAVIOR AND INTERNATIONAL POLITICS, Chapter 2,
   (James G. March and Herbert A. Simon).

TOPIC 9

****

March 3, 1971: Dr. Milstein

1. Scope.

   - Presentation and Evaluation of Student Results on the Conflict Problem

   - Presentation of Some Case Studies in Conflict Vietnam, Cuba, World War I

2. Required Readings.

   INTERNATIONAL BEHAVIOR, Herbert C. Kelman, ed. (Holt, Rinehart and Winston), Chapter 13 (Jack Sawyer and Harold Guetzkow).

3. Additional Readings.

   ALLIANCE IN INTERNATIONAL POLITICS, Julian R. Friedman, Christopher Bladen and Steven Rosen, eds. (Allyn and Bacon), Chapter 3 (Robert C. North, Howard E. Koch, Jr., and Dina A. Zinnes).

   (Milstein Paper)

   INTERNATIONAL POLITICS AND FOREIGN POLICY, Chapter 55 (Ole R. Holsti, Richard A. Brody, and Robert C. North).

4. Optional Readings.

   QUANTITATIVE INTERNATIONAL POLITICS, J. David Singer, ed. (the Free Press 1968), Chapter 1 (Dina Zinnes).

WEEK 4: PRESENTATION OF THEORIES OF ALLIANCE FORMATION:
USE OF QUANTITATIVE TECHNIQUES IN THEIR INVESTIGATION

TOPIC 10

****

March 8, 1971: Dr. Sullivan

1. Scope.

- Discussion of Theories of Alliance Formation

- Presentation of a Class Problem on Alliances: Comparison of the
Reaction of NATO Countries to the Czech Crisis with that of the Warsaw
Pact Countries

2. Required Readings.

LINKAGE POLITICS, James Rosenau (Free Press), Chapter 7 (O. Holsti
and J. Sullivan).

"Cooperation in International Politics: Quantitative Perspectives on Formal
Alliances, " J. Sullivan (Mimeo).

3. Additional Readings.

ALLIANCE IN INTERNATIONAL POLITICS, Chapter 2 (Mancur Olson, Jr.,
Richard Zechauser, and Bruce M. Russett).

QUANTITATIVE INTERNATIONAL POLITICS, pp. 247-286 (J. D. Singer
and M. Small).

4. Optional Readings.

INTERNATIONAL POLITICS AND FOREIGN POLICY, Chapter 52
(Phillip M. Burgess and James A. Robinson).

TOPIC 11

****

March 9, 1971: Dr. Young

1. Scope.

    - Work Session: Class Work on Alliance Problem

2. Required Readings.

    THEORY AND RESEARCH ON THE CAUSES OF WAR, Chapter 12
(R. Brody and A. Benham).

    (Sullivan paper on alignment)

TOPIC 12

****

March 10, 1971: Dr. Sullivan

1. Scope.

   - Presentation and Evaluation of Student Results

   - Presentation of Case Study in Alliance Formation: NATO

2. Required Readings.

   A STUDY OF COALITION BEHAVIOR, Sven Groennings, E. W. Kelley and Michael Leiserson, eds. (Holt, Rinehart and Winston), Chapter 14 (E. W. Kelley), Chapter 18 (Dina Zinnes).

3. Additional Readings.

   A STUDY OF COALITION BEHAVIOR, Chapter 13 (Michael Leiserson), Chapter 16 (Michael Leiserson), Chapter 19 (Hayward R. Alker, Jr.).

WEEK 5: EMPIRICALLY DERIVED MODELS

TOPIC 13

****

March 22, 1971: CDR Parent, Dr. Milstein

1. Scope.

   - Multiple Step-wise Regression

   - Presentation and Critique of Student Models

2. Required Readings.

   Parent Handout

   THEORY AND RESEARCH ON THE CAUSES OF WAR, Introduction to Part I.

3. Additional Readings.

   THE STRUCTURE OF SCIENCE, Nagel (Harcourt, Brace and World), Chapters 1-3.

   THEORY AND RESEARCH ON THE CAUSES OF WAR, Introduction to Parts II and III.

TOPIC 14

****

March 24, 1971: Dr. Milstein

1. Scope.

   - Discussion of Empirical Models: Their Development and Use

   - Presentation of an Empirically Derived Conflict Model of Vietnam:
Its Derivation, Validation, and Use

2. Required Readings.

   (Milstein Paper)

TOPIC 15

****

March 15, 1971: Dr. Milstein

1. Scope.

    - Class Work with the Vietnam Model

2. Required Readings.

    (Milstein Paper)

WEEK 6: JUDGMENTAL MODELS

TOPIC 16

****

March 19, 1971: Dr. Janice Fain, Dr. William Fain, Mrs. Bonnie Ayres

1. Scope.

    - Introduction to Simulation and Judgmental Model Building

    - Class Play of NEXUS

2. Required Reading.

    NEXUS Description and Worksheets - Handout

3. Additional Reading.

    SIMULATION AND SOCIETY, John D. Raser (Allyn and Bacon), Chapter 1.

    SYSTEMS ANALYSIS AND POLICY PLANNING, E. S. Quade and
    W. I. Boucher, eds. (Elsevier), Chapter 10 (R. D. Specht).

    SIMULATION IN THE STUDY OF POLITICS, W. Coplin (Markham),
    Chapter 1 (Harold Guetzkow).

4. Optional Reading.

    SIMULATION AND SOCIETY, Chapter 2.

    SYSTEMS ANALYSIS AND POLICY PLANNING, Chapter 12 (Norman Dalkey).

TOPIC 17

****

March 30, 1971: Mrs. Bonnie Ayres, Dr. William Coplin, Dr. Janice Fain

1. Scope.

    - Student Critique of NEXUS

    - Presentation of a More Complex Model of the International Environment: PRINCE

2. Required Reading.

    PRINCE Description (Handout).

3. Additional Reading.

    INTRODUCTION TO INTERNATIONAL POLITICS, W. Coplin (Markham), Chapters 3 and 5.

    INTERNATIONAL STUDIES QUARTERLY, Terhune and Firestone, "Global War, Limited War, and Peace: Hypotheses from Three Experimental Worlds." Vol. 14.

4. Optional Reading.

    INTRODUCTION TO INTERNATIONAL POLITICS, Chapters 4, 6 and 7.

TOPIC 18

****

March 31, 1971: Dr. Janice Fain,   Dr. William Coplin

1.   Scope.

- Class Play of PRINCE

- Critique of PRINCE

2.   Readings.

- None.

WEEK 7: PRESENTATION AND SOLUTION OF A GENERAL CLASS PROBLEM

TOPIC 19

****

April 5, 1971: CDR E. A. Parent, Dr. Robert Young, Dr. Jeffrey Milstein

1. Scope.

   - Review of Quantitative Techniques: Statistics, Data-File Analysis, Simulation, Time-Series.

   - Presentation of a Class Problem.

   - Discussion of Possible Approaches to the Soviet/American Arms Race Problem.

2. Readings.

   - To be assigned.

TOPIC 20

****

April 6, 1971: Dr. Robert Young

1. Scope.

   - Work Session: Class Work on Problem

   - Technique Selection by Students.

2. Readings.

   - To be assigned.

TOPIC 21

****

April 7, 1971: Jeffrey Milstein

1.   Scope.

   - Student Presentation and Discussion of Solutions to Class Problem.

   - Critique of Quantitative Methods as Aids to Solving this Problem:
Comparison with Alternatives.

2.   Readings.

   - To be assigned.

WEEK 8: SUMMARY AND EVALUATION OF THE COURSE

TOPIC 22

****

April 12, 1971: Dr. John Sullivan

1. Scope.

    - Review of Theories of International Relations.

    - Discussion of the Past Contributions of Quantitative Methods.

2. Required Readings.

    - None.

3. Additional Readings.

    - None.

4. Optional Readings.

    SIMULATION IN THE STUDY OF POLITICS, Chapter 4 (Kenneth Waltz.)

    SYSTEMS ANALYSIS AND POLICY PLANNING, Chapter 18.

TOPIC 23

****

April 15, 1971: Dr. Jeffrey Milstein

1. Scope.

   - Review and Critique of Class Activities: Data-file Examination, Development of Models by Regression Techniques.

   - Judgmental Modeling.

   - Solution of Class Problems.

2. Readings.

   - None.

TOPIC 24

****

April 16, 1971: Dr. Robert Young, CDR E. A. Parent, Dr. William Fain

1. Scope.

    - Examination of Current Trends in Quantitative International Relations; Estimate of Future Research.

    - Discussion of the Use of Computer Technology in Teaching International Relations.

    - Student Critique of this Course.

2. Readings.

    - None.

ATTACHMENT II

STUDENT EVALUATION

AND

COURSE QUESTIONNAIRE

SUMMARY OF NWC COURSE QUESTIONNAIRE AND THE COURSE EVALUATION BY THE STUDENTS

General Background

The majority of the participants were individuals who deal professionally with issues of a military nature and whose functional responsibilities are management and planning in contrast to research and analysis. The mean level of education is quite high (the approximate equivalent of a Master's degree) and most students have done some type of graduate work. The areas of academic specialization were quite varied.

Previous Level of Learning

Of the six students who completed both before and after questionnaires, fifty percent had formal training in both statistics and computer science; however, only one had used his training for study in the social sciences. This lack of applied use is further illustrated by the fact that most students indicated that they could define and explain various statistical operations, e.g., mean standard deviation, correlation and variance, but could not explain what was meant by deductive theory or operationalization. In addition, very few were able to list more than two methods for collecting social science data or to indicate how to test findings in international relations generated through the use of computers.

In view of these facts, it would be fair to suggest that the students possessed basic quantitative skills but did not know how to use them in the social sciences or understand the issues involved in such use.

Because of the experimental nature of the course and the fact that it competed with many already scheduled college activities, the student group was somewhat unstable. It started with twelve and fluctuated radically from this number, sometimes including visitors from other schools and sometimes having only a handful of students.

The following sections summarize the statistical results of the questionnaires. The statistics are based on the six students who filled in both a before and after questionnaire.

These statistics include:
- the participant's evaluation of the course,
- the level of knowledge attained by the participants,
- the participant's attitude toward the use of quantitative methods.

STATISTICAL SUMMARY

Where appropriate, before (B) and after (A) results are marked. The
reader should be careful to note that the scales shift and are not
constantly one way (good or bad).

Participants Evaluation

The objectives of the course on quantitative data anlysis were:

(a)   To provide an understanding of quantitative methods
of analysis as they are employed in studies of inter-
national affairs.

(b)   To provide a familiarity with existing theories in
international politics that are relevant to empirical
research.

(c)   To provide the opportunity to use data anlysis and
computer simulation in the exploration of selected
policy-relevant problems

Please indicate the degree to which these objectives were achieved: (Circle)

Average

4.5   Objective (a): Not at all achieved 1....2....3....4...$\overset{A}{}$..5 Achieved completely

4.0   Objective (b): Not at all achieved 1....2....3....4$\overset{A}{}$...5 Achieved completely

4.2   Objective (c): Not at all achieved 1....2....3....4.$\overset{A}{}$..5 Achieved completely

2.   Were there objectives other than those stated above which
were also achieved?

<div align="center">Yes 50%   No 50%</div>

3 - A

For each statement below, circle the number

1. If you strongly agree with the statement
2. If you agree with the statement
3. If you neither agree nor disagree with the statement
4. If you disagree with the statement
5. If you stongly disagree with the statement

Average

I was interested in learning the course material.

1.5   1 | 2   3   4   5
           A

As a result of this course, I have become more competent in quantitative techniques in the social sciences.

2.0   1   2   3   4   5
              A

The instructors attempted to cover too much material.

3.0   1   2   3   4   5
                 A

The instructors generally presented the material too rapidly.

3.6   1   2   3 | 4   5
                 A

The assignments were too time consuming relative to the contribution of my understanding of the material.

3.3   1   2   3 | 4   5
                A

The sessions were well organized.

2.1   1   2 | 3   4   5
            A

I generally enjoyed going to class.

1.5   1 | 2   3   4   5
          A

Do you think quantitative data analysis belongs in the National War
College curriculum?
                                                      B
Not at all applicable to the NWC curriculum 1...2...3.↘4...5 Very   B-3.1
                                             A   applicable   A-3.6

Do you think this type of course should be offered as an elective at the
National War College?

                            Yes___100%___   No_____

Level of Knowledge

Are you able to define or explain to another person the following terms?
(Yes or No)

	Percent Yes Before	After
mode_____	83	100
standard deviation_____	83	100
data file_____	100	100
deductive theory_____	33	100
operationalization_____	0	100
simulation_____	100	100
hypothesis testing_____	50	100
curve fitting_____	50	100
Average	62	100

How helpful would it be to have hands-on computer experience through
the use of a terminal?   (Circle)

Not helpful 1....2....3....4....5 Very helpful   B-3.8?
                              A   A-4.1?

In general, what is your attitude toward the use of computers in your
work? (Circle)

                              B
Very unfavorable 1....2....3....4....5 Very favorable   B-4.2
                              A   A-4.5

6.A

If you were given a table of the height and weight of each National War College student, could you:

		Percent Yes	
		Before	After
(a)	Work out a frequency table of heights at five inch intervals?	67	83
(b)	Plot a histogram for (a)?	67	100
(c)	Calculate the mean weight for the class?	83	83
(d)	Calculate the weight variance?	67	67
(e)	Calculate the correlation between height and weight?	83	83
	Average	73	83

Please indicate what you have learned from this course: (Circle)

(Noth'ng 1....2....3....4....5 A great deal)

Average

__2.0__ (a) Answers to specific questions that arise in my work.

__3.7__ (b) Knowledge of new techniques and/or acquisition of new skills.

__3.8__ (c) Information on what research is being conducted, how and by whom.

__2.1__ (d) An opportunity to obtain advice and criticism on some problems I have encountered in my work.

Participants Attitudes

U. S. national security making would benefit from substantial exploration of

(a)   New options for foreign policy (Circle)

                                                B   B-4. 1

Not benefit at all 1....2....3....4.\..5 Benefit greatly   A-4. 3
                                          A

(b)   *Precise techniques for analysis* (Circ'

                                            B   B-4. 3

Not benefit at all 1....2....3....4/...5 Benefit greatly   A-4. 0
                                          A

(c)   Rapid information retrieval technology (Circle)

                                            B   B-4. 3

Not benefit at all 1....2....3....4..\ 5 Benefit greatly   A-4. 8
                                           A

(d)   Systematic procedures for evaluating alternatives (Circle)

                                            B   B-4. 5

Not benefit at all 1....2....3....4..\.5 Benefit greatly   A-4. 6
                                          A

(e)   Patterns in international politics (Circle)

                                            B   B-4. 1

Not benefit at all 1....2....3....4.....5 Benefit greatly   A-3. 8
                                         A

(f)   Relationships between a nation's motives, capabilities and actual international behavior (Circle)

                                            B   B-4. 1

Not benefit at all 1....2....3....4.\..5 Benefit greatly   A-4. 3
                                          A

Please indicate your attitude toward:

    (a)   Quantitative Data Files and (Computer) Statistical Analysis
           of Quantitative Data (Circle)

Average

			A	
3.3	Not at all relevant to my work	1....2....3.!..4....5	Relevant to my work
3.5	Not alter my work at all	1....2....3..'.4....5	Alter my work
3.0	Not at all simple to use	1....2....3....4....5	Simple to use in my work
2.7	Not at all reliable for use	1....2...'.3....4....5	Reliable for use

    (b)   Computer Simulation (Circle)

3.8	Not at all relevant to my work	1....2....3...'4....5	Relevant to my work
3.0	Not alter my work at all	1....2....3....4....5	Alter my work
2.5	Not at all simple to use	1....2..'...3....4....5	Simple to use in my work
2.8	Not at all reliable for use	1....2...'3....4....5	Reliable for use

    (c)   Use of Computer Terminals (Circle)

3.8	Not at all relevant to my work	1....2....3...'4....5	Relevant to my work
3.8	Not alter my work at all	1....2....3...'4....5	Alter my work
3.7	Not at all simple to use	1....2....3...'.4....5	Simple to use in my work
4.0	Not at all reliable for use	1....2....3....4....5	Reliable for use

    (d)   International Relations Theory (Circle)

3.2	Not at all relevant to my work	1....2....3.'...4....5	Relevant to my work
2.8	Not alter my work at all	1....2...'.3....4....5	Alter my work
2.8	Not at all simple to use	1....2...'.3....4....5	Simple to use in my work
3.0	Not at all reliable for use	1....2....3....4....5	Reliable for use

Please indicate how strongly you agree or disagree with the following:

(a) International relations material defies the use of quantitative
techniques (Circle)

    B   B-3.0
Disagree strongly 1....2.../3 ...4....5 Agree strongly   A-2.5
                 A

(b) Quantification of international relations can distort important
aspects of the subject (Circle)

    B   B-3.4
Disagree strongly 1....2....3..\.4....5 Agree strongly   A-3.8
                 A

(c) International relations can benefit in several ways from the
use of quantitative techniques of analysis (Circle)

    B   B-4.6
Disagree Strongly 1....2....3....4./..5 Agree Strongly   A-4.0
                 A

(d) Analysis of statistical data files can provide me with
answers to specific questions that arise in my work (Circle)

    B   B-3.8
Disagree Strongly 1....2....3../.4....5 Agree strongly   A-3.5
                 A

(e) Data file analysis is the basis for research which may have
potential policy applications in the future. (Circle)

    B   B-4.3
Disagree Strongly 1....2....3....4.l..5 Agree Strongly   A-4.3
                 A

(f) Data collection in international relations is a waste of time,
effort and money. (Circle)

    B   B-1.6
Disagree Strongly 1../.2....3....4....5 Agree Strongly   A-1.3
                 A

(g) (Computer) simulation can provide me with answers to
specific questions that arise in my work. (Circle)

          B   B-2.8
Disagree Strongly 1....2/...3....4....5 Agree Strongly   A-1.7
                 A

(h) (Computer) simulation is the basis for research which may
have policy applications in the future (Circle)

    B   B-3.6
Disagree Strongly 1....2....3..l.4....5 Agree Strongly   A-3.6
                 A

(i) Computer-based simulation in international relations is a
waste of effort and money. (Circle)

        B   B-2.3
Disagree Strongly 1...,2.....3....4....5 Agree Strongly   A-1.7
                 A

SUMMARY OF RESULTS

Course Evaluation

The respondents tended to agree that the course objectives had been achieved and 50% (3) of them stated that additional objectives also were reached. These spin-offs were primarily related to techniques, e.g. math and statistics review and computer terminal experience.

All but one of the respondents felt that the educational methods as well as the course presentation were adequate and none suggested radical revision of the course format.

The results showed unambiguously that the most important aspect of the course was its contribution to the participants understanding of how quantitative techniques could be applied to the study of international relations. The importance of this understanding was underscored by the fact that all the students felt quantitative analysis should have a distinct place in the National War College curriculum.

Level of Knowledge Attained

All of the respondents indicated that they improved markedly their knowledge of statistics and computer science. However, what is most significant here is a belief in the improvement in their ability to apply these skills to study in the social sciences, for example, for all but one of the respondents, the issues of operationalization and data collection were clearer.

Attitudes Toward the Use of Quantitative Methods in International Relations

Both before and after the course the students' attitudes toward the utility of quantitative techniques in the study of international relations was moderately favorable. However, there are two important qualifications that must be made. First, the students tended to agree that quantitative methods can distort important aspects of the subject and that international relations may, in many instances, defy the use of quantitative methods. Secondly, although their attitude toward the use of computers in their work was very favorable, they did not see that the application of quantitative methods to international relations would help them to resolve specific problems which they faced in their work. Yet, on the other hand, there was a clear tendency for all but one of the respondents to view several of the techniques learned as important for their work (important in the sense that they are relevant to and would alter their work). The use of computer terminals was seen as the most important and simulation second in importance.

The attitudinal items showed a generally favorable trend towards quantitative methods as applied to international relations, but this positive effect was tempered by skepticism.

As a broad summary statement, it could be said that the participants viewed the courses as instrumental in providing them with new insights into the use of computers and quantitative techniques for the analysis of foreign policy problems.

ATTACHMENT III

MEMORANDUM FOR THE COMMANDANT

22 April 1971

MEMORANDUM FOR THE COMMANDANT

THRU: THE DEPUTY COMMANDANT

SUBJECT: Test Course in Quantitative Methods in International Relations

1. The test course in quantitative techniques was held from 12 February to 16 April 1971. Twenty-one, two hour sessions were held. The following course objectives were met:

- To provide an understanding of quantitative methods of analysis as they are employed in studies of international affairs;

- To provide a familiarity with existing theories in international politics that are relevant to empirical research;

- To provide the opportunity to use data analysis and computer simulation in the exploration of selected policy-relevant problems.

Students were provided with an overview of the quantitative approach to international politics. These approaches included the concepts of data files, statistical analysis, mathematical models and simulation, and gaming techniques.

2. Reaction to the course was generally good even though the circumstances under which the course was conducted were not the standard elective course conditions. The course was given to student and faculty volunteers and was in addition to the regular elective courses. It was extra long, forty-two hours, and covered difficult concepts rather rapidly. However, the ability of NWC level students and faculty to grasp these ideas and concepts rapidly was clearly evident by their very germane questions and discussions.

3. One of the interesting features of the course was the play of a new International Relations game called Programmed International Computer Environment (PRINCE).

PRINCE is an interactive-man-machine simulation in which a single player (or team of players) assumes the role of the U.S. foreign policy-makers.

It has some features in common with the World Politics Simulation (WPS) played at ICAF. Both are representations of some aspects of the international economic and political scene and both focus to some degree on the domestic reactions to foreign policy actions. They differ significantly in the level of effort required to use them for educational purposes. WPS requires at least 6 players per team and continual monitoring of the player's actions by a control team who must have had extensive previous training in the operation of the game. PRINCE, on the other hand, may be played by one player (or team of any size) who plays essentially on his own after a brief introduction to the game.

While the recent play of PRINCE by students at the National War College was generally successful, there were some suggestions for desirable changes:

● The input forms were found to be simple and convenient to use, but the output format was felt to be too rigidly structured and, at a teletype terminal, entirely too long.

● Validity of the basic assumptions in the model were questioned (as of course, are all model structures) and should be tested against real data.

● The time assigned to the play of PRINCE was too short to permit enough cycles of play for the students to see the long-term effects of their decisions. In all, only 6 hours were devoted to PRINCE: the description and introduction, the play, and the critique session. Each iteration, or play of the game, simulates one month of time, thus making the play less dramatic than a game like WPS.

The overall effect was good and the game should be included as part of the elective course. Some additional effort would make it an excellent tool for illustrating some of the principles of international relations theory.

4. The quality of course materials, including printed handouts, recommended readings, data files, computer software, was excellent. Instructors were well organized, extremely competent, and interacted very well with the students.

5. Continued sponsorship of this course by NWC as part of the regular electives program is recommended. A significant base of materials has been collected as a result of support given by the Advanced Research Projects Agency. All of the printed matter, data files, computer software, lesson plans, lecture outlines and reference materials are being organized and prepared by Consolidated Analysis Centers Inc. (C.A.C.I.) as a self-contained course. All of these materials will be available to all service schools this summer.

Not all of the materials and ideas presented in this test course need be used next year. This course was deliberately designed to cover a wide range of concepts and techniques so that broad experience could be obtained in developing an appropriate elective. Some paring down could now be accomplished to present a tailored course to meet NWC needs in the elective program.

E. A. PARENT
CDR SC USN
Course Director

copy to:
ARPA (Dr. George Lawrence)
C.A.C.I. (Dr. W. W. Fain)
COL De Graf
CAPT Rizza
LTCOL Smith

END