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DISSERTATION

REPORT

IS 8995

USING DIALOG CIP AT WINONA STATE UNIVERSITY TO EDUCATE END-USERS

by

Kathryn Sullivan

Nova University

July 24, 1991

A Dissertation Presented to the

Center for Computer and Information Science

for the Degree of Doctor of Science in

Information Science

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Abstract

Graduate students need to know the resources of their university library in order to do research and cannot be expected to remember any library training they may have received as undergraduates. A class offered by the library on how to search databases available through DIALOG's Classroom Instruction Program (CIP) was proposed, in cooperation with existing research classes in the student's field. A study was conducted at Winona State University, Winona, MN, with research classes offered by two professors in the field of special education. The study was to determine whether the information presented in an instruction session based on six learning objectives --choosing a database, choosing search terms and connectors, using search commands, modifying the search online, printing search results, and logging out--would enable graduate students to conduct an online search. Eighteen graduate students were provided with an hour's free searching on DIALOG in order to locate citations on their own choice of topic as part of an assignment from their instructor. Questionnaires were used to gather student assessments of their skills before and after their DIALOG search, while observation of the student during the search and examination of the actual printout of the search were used in conjunction with performance indicators to rate the actual skill in using DIALOG. All of the students were able to search DIALOG and print out citations but, based on performance indicators, none had the skill to be fully independent searchers.

Table of Contents

		Page
CHAPTER 1	INTRODUCTION	9
	Statement of problem	9
	Background	10
	Online searching at Winona State University	13
	Purpose	21
	Significance	22
	Assumptions and limitations	22
	Major issues and research questions	26
	Definition of terms	27
CHAPTER 2	REVIEW OF THE LITERATURE	28
	Rationale	28
	End-users	28
	Teaching	33
	Databases	36
	Future development	39
	Summary	42
CHAPTER 3	DESIGN, PROCEDURES AND METHODOLOGY	43
	Procedures and methods	43
	Program	43
	Subjects	44
	Training	45
	Learning objectives	46

Table of Contents

Page

Searches 47

Objective 47

Restatement of the research questions 48

Discussion of the population 48

Discussion of major variables and their treatment 50

DIALOG commands 50

Training 50

Debriefing 51

Evaluation design 51

Literature 51

Performance indicators 53

Instrumentation 54

Data gathering techniques 55

Expectations 56

CHAPTER 4 RESULTS 58

Questionnaire responses 58

Library experience 58

Computer experience 58

Database usage 61

Citation relevancy 61

Difficulties 61

Pre-Post responses 62

Table of Contents

Page

Student's t-test 73

MANOVA 74

Performance indicators 75

Ranking 75

MANOVA 81

CHAPTER 5 DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS 84

Discussion 85

Implications 87

Staff 87

Cost 89

Equipment 90

Recommendations 91

Summary 94

REFERENCES 96

TABLES

1 Searches on DIALOG at Maxwell Library during School/Fiscal Year 15

2 Major Databases Searched at Maxwell Library 19

3 Requestors of DIALOG Searches at Maxwell Library 20

4 Search Appointments 59

5 Responses to Questions 1-3 60

6 Statistics on Student Questionnaire Responses 64

7 Statistics on Performance Indicators 76

8 Univariate Homogeneity of Variance Tests 82

FIGURES

1 Histograms of student questionnaire responses before 65

2 Histograms of student questionnaire responses after 69

3 Histograms of performance indicators 77

APPENDICES

A Acronyms 108

B Feedback 109

C Handout 1..... 110

D Handout 2 Sample Searches 114

E Handout 3 DIALOG Commands 128

F Timeline of Activities 129

G Copy of Support Letter from Library Director 135

H Estimate of DIALOG Classroom Instruction Costs 136

I DIALOG Training Questionnaire 138

J DIALOG Training Questionnaire Responses 140

APPENDICES

K	Datafile	147
L	Histograms of Student Questionnaire Responses	149
M	Histograms of Performance Indicators	175
N	T-test on Overall Skills Before and After	188
O	MANOVA Student Responses Before Searching	194
P	MANOVA Student Responses After Searching	218
Q	MANOVA on Performance Indicators	245
R	MANOVA on Restricted Performance Indicators	266
S	T-test on Actual Overall Skills vs Perceived Skills	288
T	Impact Statement	293
U	Biographical Sketch	299

Chapter 1

Introduction

Statement of Problem

The investigator has observed that graduate students attending Winona State University in Winona, Minnesota, do not appear to be aware of library resources available in their field of study. Research cannot be done in a vacuum. The work of others published in the literature of a particular field supports additional investigations. However, for some students, finding articles in the professional literature is the most time-consuming part of a research study. The student's library skills and previous use of the library are often a factor. Often a student only comes into contact with general indexes such as Reader's Guide to Periodical Literature and does not realize that more specialized indexes, such as Psychological Abstracts, exist. Other students only use paper indexes and have yet to discover the availability of those sources on CD-ROM or online services such as DIALOG. The instructors have no way of knowing the level of library skills within the class and often assume that students have learned about library resources from freshman English courses, but the freshman English courses never cover the resources needed for graduate research. For nontraditional students, freshman English may have been taken many years before the advent of CD-ROM or online sources.

Background

Database searching was once a service offered by only the most prestigious of libraries, whether academic or public. In recent years, however, database searching has joined the list of services commonly offered by university libraries and even now has become as important and essential as interlibrary loan. The databases searched are as varied as the libraries: from the indispensable OCLC from the Online Computer Library Center (formerly the Ohio Center for Library Cataloging) once used only by cataloging librarians, or other single specialized services such as WESTLAW, to services accessing numerous databases, such as DIALOG.

DIALOG has become an increasingly popular reference tool in many areas; libraries, hospitals, and businesses all benefit in many ways from its existence. Serious searchers can obtain access from their home micro-computers (Tenopir, 1983); public libraries use DIALOG as part of their reference service (Golomb and Reisman, 1984); and even high school students learn DIALOG searching as part of their basic library skills (Tenopir, 1986; Waddle, 1990).

Winona State University is one of eight universities in the Minnesota State University System. With current enrollment of 7,514 (Dawson, 1990), Winona State University was the first state normal school west of the Mississippi and still graduates a large proportion of students in the field of education--177 out of 761 graduating in 1990 ("130th Commencement," 1990). The 235-student paralegal

program at Winona State University is among the small number in the nation offering an American Bar Association-approved four-year degree (Dawson, 1990). Winona State's graduate and undergraduate programs continue to grow. Winona State University became the first undergraduate school in the nation to offer an engineering degree in composite materials--high strength, plastic materials developed for businesses and industry (Dawson, 1990)--and three new master's degrees are now offered in composites engineering, nursing and special education. An engineering center specializing in composite technologies is planned to open in the spring of 1992 (Beal, 1991).

Although the library at Winona State University has been said to "highlight" the university's educational facilities (Winona State University Undergraduate Catalog, 1989-91, p. 9), the physical facilities at Winona State University's Maxwell Library were reviewed at the last legislative session for a proposed bonding bill for a new building. According to the Library Project Detail (1990),

> Maxwell Library was originally constructed in 1938 with 35,276 total gross square footage and served a student body of 450. Currently, 40 percent of the collection and five of the library's seven departments are housed in that facility, which is shared with University Archives, Student Health Services, and faculty offices.
>
> An addition, completed in 1968 to accommodate a student body of 3,844, provides gross square footage of 59,218 for

> 60 percent of the book collection, all microfilm services and 85 percent of the library's reader space.
>
> Total space for library service today, which includes a government documents depository, is 87,567 gross square feet, serving a student body of 7,634, of whom 6,457 are on the main campus. An additional 7,000 square feet are devoted to University Archives and Student Health Services.
>
> The existing library facility is unable to meet the study needs of students, and the electrical, acoustical, climatic, ventilation, and flexible space requirements of the electronic, telecommunication, and computer activities of a "smart" library are impossible to achieve. (p. 2)

According to the Undergraduate Catalog (1989-91), the library contains over 180,000 volumes, 632,026 units of microfilm documents, "and a wealth of public documents and periodicals" (p. 9).

Winona State is one of the seven universities in the state university system with access to PALS, Project for Automated Library Systems (plans are for the eighth university, the Akita campus in Japan, to eventually be linked into the system). The PALS system shares online public access catalogs, circulation control, interlibrary loan and serials control among the system libraries and online public access catalogs with several of the private colleges and community colleges in the state of Minnesota and a few state universities in North Dakota.

Online Searching at Winona State University

In November 1985, Maxwell Library of Winona State University began subscribing to DIALOG Information Services. The Government Documents librarian was assigned the responsibility of searching DIALOG along with regular duties. Only two other librarians were trained as backup.

The demand for DIALOG searches grew slowly, since the service initially was offered only to faculty and graduate students (by 1987, seniors and juniors were allowed to search). November and December 1985 had only 17 requests for searches. But the availability of the service was well-publicized, and word-of-mouth brought in more students with search requests. By the end of the 1985-86 school/fiscal year, 66 searches had been requested (see Table 1).

Then, in March 1987, as the result of reorganization, the job of searching DIALOG fell to the Curriculum Librarian (one of the two backups) as her area was near Government Documents. (The terminal was later moved further from both areas, into Cataloging Department.) DIALOG searching was done only when the Curriculum Librarian could spare time from her other duties, and the availability of the service was only known by word-of-mouth. The existence of the service was no longer publicized, except by instructors and students who had used it.

Three academic departments at Winona State University expressed great interest in the DIALOG service long before Maxwell Library

obtained a modem. The College of Nursing and Health Sciences in school year 1988-89 had 433 majors attending classes at both the main campus and the WSU Rochester Center in Rochester, MN (a 55-mile drive from main campus). In the College of Education, the Educational Administration department had 313 undergraduate majors and 56 students studying for the specialist degree or certificate. The Special Education department in the 1988-89 school year was attempting to institute a major and had 160 undergraduate minors at both the main and the regional campus and 12 students studying for specialist degrees. Both the Special Education department and Educational Administration department relied heavily on ERIC and their students spent a great deal of time doing manual searches of the ERIC indexes.

All three departments from 1985 to 1988 expressed an interest in the possibility of their students doing their own online DIALOG searching. The students in these programs ranged from students familiar with search strategies through usage of Maxwell Library's PALS online catalog for the book collection to nontraditional students unfamiliar with the idea of computer databases. Numerous complaints were made by nursing students to the DIALOG Librarian and backup searcher in the 1987-88 school year to the effect that they had signed up for a particular class under the assumption that they would be doing online searching themselves, rather than filling out requests for searches to be done (M. Youngck, personal communication, 1987-88).

Table 1

Searches on DIALOG at Maxwell Library during School/Fiscal Year

1985-86	1986-87	1987-88	1988-89	1989-90
66	93	106	250	90

Note: Cost recovery charging went into effect Spring Quarter 1989 (beginning February 1989)

InfoTrac Reference Workstation, containing the General Periodicals Index and SilverPlatter ERIC, arrived October 1989

Although there were numerous guides to DIALOG searching available (Elia, 1984; Kesselman, 1987), many presupposed two important details: that the library involved has many modem-linked terminals available for public use, and that the library has the funds to purchase the additional service. Maxwell Library had neither. Moreover, at that time the library did not have the staff, equipment, or classroom space to train students to be end-users on DIALOG. An additional difficulty was (and still is) in the arrangement of the main and regional campuses. Materials available at one campus are often lacking at the other. The WSU Rochester Center, which once had a small library of journals and indexes (including a few volumes of Resources in Education), is now at the Rochester Community College, and the Special Education department must borrow volumes of Resources In Education from Maxwell Library to

take to Rochester to demonstrate manual searches of the index. The Community College Library offers DIALOG service, but, during that time period, only to community college students.

Responding to these complaints as back-up searcher on DIALOG, the investigator allowed students to sit by the terminal (then located in the Cataloging Department) while their searches were conducted. Students were then able to offer interactive comments "on-the-spot" to broaden or narrow the searches, resulting in more successful searching. But, the crowded conditions in Cataloging did not allow for much explanation of DIALOG commands and search strategies. And, given the numbers of students in the programs, one-to-one instruction of this kind was seen by the library department to take more time than the DIALOG librarians could spare from their assigned duties. For a cognitive research project a computer program was designed using UTAH Pilot authoring language to simulate DIALOG responses to a search in the ERIC and biomedical databases. As both the main campus and the Rochester campus have computer labs, the computer disk containing the program could be used by students at their leisure. A computer assisted instruction (CAI) program, using the PILOT programming language (specifically UTAH PILOT for DOS-PCs), seemed the best way of conveying basic information about DIALOG in a manner that permitted the student at the same time to get a limited understanding of how DIALOG worked. Because the Special Education and the Educational Administration departments and the College of

Nursing and Health Sciences were the heaviest users of DIALOG, the PILOT program was designed to demonstrate to those patrons how to do simple DIALOG searches in the ERIC and some of the medical databases. With both ERIC and the biomedical databases on one disk, the user had more options with which to experiment.

Disks containing the program were given to faculty in the College of Nursing and Health Sciences and the Special Education and Educational Administration departments (see Appendix B). A further arrangement was worked out with the DIALOG/Curriculum Librarian to allow those students who went through the CAI simulation the opportunity to attempt a DIALOG search by themselves under librarian supervision. However, despite previous complaints from nursing students wishing to conduct online searches themselves, no student attempted to do so once the opportunity was given (Sullivan, 1988).

By the end of school year 1987-88, the DIALOG/Curriculum Librarian decided to withdraw from DIALOG duties, and the responsibility of handling DIALOG searching fell to the last backup searcher, the investigator of this study. Since the investigator's main area of responsibility, Periodicals, was on a different floor from where the DIALOG terminal was then located, the DIALOG terminal was moved from the Cataloging Department. Its new location behind the Periodicals counter was almost as crowded as in Cataloging, but the service was more visible to the public.

By November 1988, the amount of searching had increased to the point where Maxwell Library had to either restrict searching to databases to which the library had no paper indexes (such as Sport or ABI/Inform) or charge for the cost of the searches. Since the heaviest use of DIALOG was still in nursing, educational administration and special education (see Table 2) and the main requestors of searches graduate students (see Table 3), typically nontraditional students who lack the time to look manually through the library's entire collection of indexes, the first choice (that of restricting searching to databases to which the library had no paper indexes) was voted down by the library department. With the start of Spring Quarter 1989 (February 1989), Maxwell Library began charging cost recovery for DIALOG searches.

At the present time, the DIALOG Librarian offers instructive noncredit talks on database searching to graduate level classes on request. The instructive noncredit talks vary with the location of the class. If in the classroom, copies of actual searches (as was presented beforehand to those attending the electronic classroom session given March 10, 1990 at Nova University (ecr/SULLIVAN/dialog.900310 in ecr library)) and explanatory handouts (see Appendix C for a recent sample handout) are distributed. If the talk is presented in the Periodicals Department, a live demonstration of DIALOG searching will usually be included.

Table 2

Major Databases Searched at Maxwell Library

1988-1989	
Number	Name
58	ERIC
36	Nursing & Allied Health
30	PsycINFO
21	Medline
12	Sport
11	CA Search
7	Dissertation Abstracts Online
6	ABI/Inform
5	Sociological Abstracts
64	Other

1989-1990	
Number	Name
22	ERIC
6	Nursing & Allied Health
9	PsycINFO
5	Medline
2	Sport
3	CA Search
2	Dissertation Abstracts Online
6	ABI/Inform
6	Sociological Abstracts
29	Other

Table 3

Requestors of DIALOG Searches at Maxwell Library

Year	Graduate	Undergraduate	Faculty	Community
1988-89	160	10	80	0
1989-90	30	10	43	7

Note: Cost recovery charging went into effect Spring Quarter 1989 (beginning February 1989)

InfoTrac Reference Workstation, containing the General Periodicals Index and SilverPlatter ERIC, arrived October 1989

However, only the same three academic departments have made this talk a standard part of their courses. Faculty from those three academic departments have the computer disk containing the PILOT program on DIALOG searching available for students to review. The library also began subscribing to ERIC on CD-ROM in October 1989. The strongest evidence of this service's popularity with graduate students in the special education and the educational administration programs is the effect that the dropoff in DIALOG searching in ERIC (see Table 2) has had in the decline in total DIALOG searching between school years 1988-89 and 1989-90 (see Table 1). In 1988-89, there were 250 searches in DIALOG; in 1989-90, there were 90 searches. The ease in searching

ERIC on CD-ROM has made that database more known at the expense of other databases available (as yet) only online. More needs to be done to provide adequate information about the available resources for research.

Purpose

Publicity about the availability of online database searching at the library is not enough to interest people in the use of the service. Mere mention of the fact that Maxwell Library charges for DIALOG searches discourages some students. Others feel that they can find enough information through manual search of the paper indexes and never consider the time-saving factor of database searches.

A bibliographic course offered by the library would appear to be the best method of informing students about the library's resources; however, the English department offers library instruction as part of the freshman Composition course and will not consider any other option for library instruction at present. Although the library still lacks classroom space, equipment, funds, and staff to adequately handle bibliographic instruction, now is the best time to investigate the possibilities. A new president of Winona State University was inaugurated in May 1990 and has expressed support for the library, including the need for a new library building and an increase in the library budget. A new director of Maxwell Library was hired in July 1989 and has an interest in new services that the library can offer.

Online database searching by patrons is but one of many possible bibliographic outreach services, but improvement of DIALOG services has a demonstrated need. The offering of online database searching by patrons would also currently justify the need for classroom space for bibliographic instruction in the proposed new library building, along with additional equipment.

Significance

The idea of allowing online database searching by patrons is increasingly mentioned in library literature (Sieburth, 1988; Quint, 1990; Sanderson, 1990) and at meetings of various library associations of Minnesota. A speaker at a recent library directors meeting in Minnesota hosted by PALS (Project for Automated Library Systems) brought up the idea that librarians should be training their patrons to become end-users, not only in the usage of the online public access catalogs, but in database searching (E. Lange, personal communication, May 10, 1990). And, as PALS begins to add databases such as ERIC and Psychological Abstracts to the online public access catalogs of the Minnesota library system (presently under development--ERIC became operative online July 30, 1990, on a trial basis), the need for such training of library patrons will become apparent.

Assumptions and Limitations

One assumption was that the graduate students in this study would not be faced with the time constraints, unavailable databases and lack

of confidence that Cornick (1989) noted made some people prefer not to be end-users. Searchers on the SilverPlatter ERIC from the Special Education department have been observed to be uneasy using the CD-ROM whenever only a student assistant is on duty to answer questions. Since the DIALOG librarian was at hand to answer questions during end-user searches, that problem did not arise. However, the amount of times help was requested and the type of assistance requested was counted so that a measure of performance could be established.

An additional assumption was that the graduate students chosen to take part in this study would be representative of graduate students at Winona State University and therefore similarities would exist between the groups. The students were all in the special education program, all were graduate students and, as two of the classes (one from each instructor) were offered at night, the groups contained nontraditional students as well as traditional students. During the course of this study, any comparison or statistical test between the two groups was done to confirm the assumption of similarity between the two, not to emphasize any possible existing differences. Since the graduate students were in the field of special education, not library science, the assumption was that they were not competent online searchers. The guides and instructional materials were prepared with that assumption in mind.

A final assumption was that the teaching styles of the two faculty members involved in this study would not affect the similarity

between the two groups of end-users. Instructor enthusiasm could influence student response, and the study was not controlled for instructor prejudice towards the need for online searching. However, since both instructors had the same attitude towards and support for online searching, this prejudice was thought to have no effect on the responses.

The main limitations were that Maxwell Library only has one librarian performing DIALOG searches and only one terminal for DIALOG searching. This limitation meant that would-be end-users had to schedule times to do online searches or make certain in some manner that the DIALOG librarian was on duty when they planned to be in the library. This limitation also meant that end-user searching during this study could not be fully user-directed. A fully user-directed search would mean the end-user could run a search any time. However, due to the present location of the DIALOG terminal in the office of the Periodicals Librarian and the need to set the proper password for the DIALOG Classroom Instruction Program when requesting DIALOG access, this limitation was taken into consideration when the results were analyzed. This limitation, however, also meant that, with only one librarian overseeing the searches, the count of end-user searches was accurate.

Although both groups received the same overall treatment, because of constraints by the instructors, the groups received equal treatment

in different ways. Instructor One, due to the possible overlap of students in the three classes taught by this instructor, had students attend one of two hour-long sessions scheduled outside of the regular class hour to learn DIALOG searching. Instructor Two brought the class into the library for a two-hour tour, which ended with a 45-minute session on DIALOG searching. Each group was given the same background on DIALOG, handouts, DIALOG commands, and other information all based on the same learning objectives. However, as the group that attended the tour had so much other information presented at the same time as the DIALOG instruction, there might have been a limitation on the amount of information retained.

Another limitation was the lack of random placement and inability to control chance factors like the different instructors' DIALOG assignments. Campbell and Stanley stated that "the most adequate all-purpose assurance of lack of internal bias between groups is randomization." (1963, p. 25). The usual statistical tests are "appropriate only where individual students have been assigned at random to treatments." (Campbell and Stanley, 1963, p. 23) The random assignment of students, however, was not possible due to the constraints of the instructors involved in this study. Campbell and Stanley (1963) stated that the solution to the problem of randomization of the student was to "move the randomization to the classroom as a unit." (p. 22)

A further limitation was the limitation to DIALOG and its databases. Other database services exist, and several, like the BRS

Instructor (Quint, 1990, p. 52 & 60) and Telebase's Answer Machine--which became Direct Connect (Fayen, 1988)--may be more user friendly or less expensive.

Major Issues and Research Questions

The major issues and research questions for this study included the following: the feasibility of offering bibliographic instruction by library staff, the possibility of improving declining DIALOG searching by giving students the opportunity to search the databases themselves, and the capability of students to learn efficient searching tactics online. There are many questions that need to be answered before end-user searches can be offered at Maxwell Library. What will be the impact of such a service on the staff? Can the present staff take on additional duties, or would it be wiser to hire an additional librarian? What will be the impact on the equipment budget? How big a demand would such a service produce and how many additional terminals will be needed to cope with the demand? Will the offering of end-user searching increase the amount of DIALOG searches, or will the level of online anxiety, frustration and charges indicate that additional CD-ROM indexes would better serve patron need?

Other questions will be indicated by this study, such as how much instruction will suit an end-user's needs best? Can a student learn enough from information presented during a short instructional period to adequately search DIALOG, or would longer instructional periods and practice time increase a student's confidence and efficiency?

Definition of Terms

The terms used for the purposes of this dissertation are as follows:

Connector: used to refer both to the Boolean logic connectors ("and," "or," and "not") controlling the logical relationships between sets and the proximity connector ("()") used by DIALOG to indicate phrases.

Database: usually, a set of citations, often with abstracts, to books, articles, reports, etc., stored in machine-readable form (Sullivan, Wippern, Gorgman, Weber, & MacLeod, 1985, p. 31).

End-user: a library patron searching a database directly, without an intermediary such as a librarian or other expert searcher.

Keyword: words and phrases from titles and abstracts.

Mediated searching: online database searching through a librarian or other expert searcher.

Online searching: the linking of a local terminal by telephone lines to a large remote computer with which a user can communicate and through which a user can request bibliographic citations and other information (Sullivan, Wippern, Gorgman, Weber, & MacLeod, 1985 p. 31).

Search term: a word, phrase, number, descriptor, or keyword used to locate citations within the database.

These definitions have been developed from the investigator's experience with database searching (see Appendix C) and familiarity with the literature of this branch of library and information science.

Chapter 2

Review of the Literature

Rationale. As this study concerns the teaching of university student end-users using the DIALOG Classroom Instruction Program, the literature was examined for those studies pertaining to end-users, the reasons for training users to become end-users, the method of teaching and the database service used for training.

End-users. Sieburth (1988) provided the best possible summation of reasons for and against providing online searching by patrons. His list included the following:

Reasons for Offering End-user Searching

To relieve the search service of performing brief, simple searches

To help develop the independence of library patrons

To make it easy for patrons to do an online search on their topic without having to find a librarian and make an appointment

To allow patrons to do a search and get some immediate results instead of having to explain the topic to someone else who will do the search and who may not understand the problem

To provide a method for offering online searching for large numbers of undergraduates

To attract students to the library and to increase their interest in information retrieval

To use as a means of teaching information seeking skills for current work and future career applications

To encourage patrons to learn greater appreciation for the search process and what an online search can produce

To use as a tool to encourage patrons to learn more about indexes and other library resources

To create more use of library materials, especially journals

To enable the library to offer low-cost or free online searching

To generate excellent publicity for the library.

Problems of Providing End-user Searching

Only one person can use a microcomputer or terminal at a time.

Patrons may expect to find the full text of articles, and they may not realize what they are searching.

Patrons may not understand when other sources will provide better or more information.

> Online systems are not usually suitable for general or historical questions.
>
> Librarians must be responsible for one more service and may have to provide more training, supervision, and maintenance of additional equipment.
>
> May mean more scheduling, records, additional charging system.
>
> Patrons may need help with search technique, interpreting results....
>
> Additional costs for access to databases, equipment, supplies, space, furniture, staffing. (p. 276-277)

These factors are not often taken into consideration when the initial idea of end-user searching is proposed, and, for understaffed libraries like Maxwell Library, these should be a primary consideration. Ohio State University library offers mediated searching because "the needs for instruction and counseling of end users, both pre- and post-search, and the necessity for staff monitoring made the use of BRS/AD and Knowledge Index as end-user services an unfeasible proposition" (Ankeny, 1989, p. 507).

Rockman (1986) surveyed academic librarians offering end-user search services and found that librarians felt that the disadvantages of the service outweighed the advantages (p. 9). However, Rockman attributed that finding to the librarians' length of experience with the database systems as well as the characteristics of the

systems used (p. 9). The advantages reported included increased user satisfaction, enhanced campus image, access to current information, low cost, ease of use, reduced librarian workload, user awareness, improved access to periodicals, and bringing patrons to the reference desk (p. 16). The disadvantages reported were increased workload, unprepared users, machine malfunctions, restrictive results, less use than expected, restrictive hours, downtime, increased interlibrary loan, high cost, difficult commands, lack of training materials, poorly designed software, and "assume library owns listings" (p. 17). Juhl and Lowry (1990) noted that "most end-user database services such as BRS After Dark or Knowledge Index limit searching to evenings and weekends. End-user searching also requires a considerable amount of librarians' time in training users, administering searching schedules, and bookkeeping" (p. 74).

Pao (1989, p. 209) agrees that most users perform simple searches, preferring convenience and speed over other capabilities of the systems. Cornick (1989) reported that this preference for speed and convenience might lead possible end-users to decide to have a librarian do their searching (p. 51-52). Friend (1985) predicted that "end-user developments will actually extend and expand the functions of the search intermediary rather than eliminate the need for such individuals" (p. 141).

Quint (1990), however, commented, "Your next online marketing program may involve training end-user searchers. Why not? It's about

time. With millions of computer literates out there, it is ridiculous to have so much intermediary searching" (p. 95). Walker (1988) wrote "evidence suggests that in the future the greatest number of end-users will be outside libraries, untrained and unsupervised, using personal computers in their own homes and offices" (p. 27). Clark and Gomez (1990) found that 21 percent of the faculty at Texas A & M searched online databases directly rather than through the library (p. 242).

Wagner (1988) noted:

> One of the advantages of an online search is the capability of retrieving information on subjects which are not index terms; it is difficult and time consuming to search a printed index under broad subject headings for a term which is too new or too specific to be included in the subject indexes. (p. 34)

Anders and Jackson (1988) found that the majority of end-users, when faced with a choice between using the CD-ROM version and searching online, will search a database online because the opinion was that "online is better" (p. 30). Juhl and Lowry (1990) found that "for comprehensive and retrospective searching without confusing menus, disc changes, or limited search options, the online version of a database proved more valuable" to end-users in their study (p. 73). Charles and Clark (1990) found that the majority of participants in their study agreed that conducting an online search to update a previous search done on CD-ROM outweighed the time and effort

involved (p. 328). Smith & Smith (1991) noted that users at Nazareth College of Rochester were using the CD-ROM databases "in conjunction with, rather than as a direct substitute for, librarian-mediated searches" (p. 41).

Teaching. Sanderson (1990) suggested that the end-user teaching should be in two parts:

> "a. programs which emphasize the capabilities of the system and the types of information which can be obtained.
>
> b. hands on sessions in which end-users are taught how to do basic searches." (p. 68)

Sieburth (1988) summarized, "patrons may learn how to search by experimentation, counseling, tutoring, workshops, or a course in bibiographic instruction" (p. 291). Rockman (1987) described the three most commonly used methods as "course-integrated instruction, classroom-based instruction, and stand-alone instruction" (p. 11). Rockman added, "while librarians are not in agreement about the optimal instructional method for educating and training end-users, there is sentiment that personalized instruction by a librarian enhances learning" (1987, p. 14). Walker (1988) found similar reactions in a study of the literature, summarizing that "users with the best results had been taught by a librarian, as opposed to teaching themselves from system documentation or by using a computer-aided instruction program....or even receiving instruction at a system training session" (p. 20).

Students at California State University Northridge were given a classroom demonstration and the opportunity to sign up for hands on sessions (Henry, Dodson, Magnuson, Anderson & Barrett, 1988, p. 16). Pennsylvania State University offered students in its end-user training program two training sessions before the search appointment (Friend, 1985, p. 137), then cut back to one session (Friend, 1988). At present the library also demonstrates online searching on a mobile online/CD ROM workstation in classes outside of the library (Wright & Friend, 1991, p. 75). Sheridan (1990) mentioned that collaborative learning should be preferred over "one-shot sessions in research strategy" (p. 23).

Stand-alone instruction is used by the Memphis State University Library, which furnishes end-users with documentation on BRS/After Dark (Mader & Park, 1984) and University of Ottawa, which has a step by step inhouse search manual on BRS/After Dark for users (Janke, 1983, p. 4).

A teaching guide written by Hunter and Lodish (1989) for middle school through senior high level on online searching in either BRS Instructor or DIALOG's Classroom Instruction Program contains useful instructional objectives for university students: defining the problem to be solved, identifying the information needs and potential sources of information, planning and conducting online database searches, evaluating information, analyzing and synthesizing information, applying information, and collaborating (p. 5-6). Although the activities seem too simple for graduate students, Twilde (1988) provided similar

activities at a workshop on online searching for the faculty, staff and administration at Annandale (p. 25). Participants only performed searches after their group had clarified research topics, selected appropriate data bases and planned effective search strategies.

Wright and Friend (1991) listed general knowledge and specific skills needed for searching. The general knowledge included

1. An understanding of what an electronic database is.
2. How the electronic product relates to other information sources in the same subject area (print or electronic). (p. 74)

The specific skills needed for searching included

1. A knowledge of the searching conventions of the system being used (command structure, including searching and displaying results).
2. The ability to interpret the computer screen interface and keyboard, use function keys, and enter terms.
3. The ability (and the patience) to read and interpret instructions, both on the screen and from user aids or manuals.
4. A basic understanding of Boolean logic and how to combine terms to retrieve results.
5. For most systems, an understanding of the differences between free-text terms and controlled vocabulary. (p. 74)

The skills of logic and critical thinking are recommended by Callison and Daniels (1988) as necessary for high school students for searching, but those skills would be valuable for university students as well. "First, students must be challenged to think and make decisions about the merits of the information they seek and obtain. Second, students must be given time to experience this process" (p. 180).

Thomas (1986) reported on several instructional aids used by academic libraries to teach end-user searching as well as including actual evaluation/questionnaires. End-user searching workbooks were also included in the report by Sullivan, Wippern, Borgman, Weber and MacLeod (1985).

Databases. Simulated databases can be used to teach online searching strategies (LaBorie & Donnelly, 1985; Broadway, 1988; Sullivan, 1988) or for classroom demonstrations (Palincsar, 1988), but the usual manner of teaching DIALOG search techniques has been actual hands-on experience in one of the cheaper databases (Elia, 1984; Tenopir, 1986). DIALOG's Classroom Instruction Program, with a rate lower than the present cheapest database at $15 per connect hour ($0.25 per minute--ERIC is $0.50 per minute) has been mentioned in the literature in reference to elementary and high school students (Aversa, 1987; Fiebert, 1987; Kesselman, 1987; Lodish, 1987; Oley, 1989). Walker (1988) commented in regard to DIALOG Classmate, BRS/Instructor and Wilsonline that "it is notable that almost all of this searching in

schools is being done on the full versions of the online systems, since few schools appear to be making use of the "user-friendly" versions, possibly because of the limited access times" (p. 16). Very little has been mentioned about university users of DIALOG's Classroom Instruction Program. Twilde (1988) commented on the program's use on the community and junior college level for class library orientations, specialized class projects, and training individual students to conduct online searches on topics for class assignments (p. 26). CIP use at Annandale Library has now expanded enough for the library to offer a one-credit research skills class (Twilde, 1988, p. 26).

More articles about online end-user searching as part of an academic bibliographic instruction course dealt with teaching online searching in the reduced rate, evening hour database services such as BRS/After Dark (Friend, 1985; Janke, 1985; Penhale & Taylor, 1986; Thomas, 1986; Littlejohn, 1987; Cornick, 1989) and DIALOG's Knowledge Index (Anders & Jackson, 1988; Bell & Halperin, 1989; Turner, Kaske, & Baker, 1990; Charles & Clark, 1990). Aversa & Mancall (1987), however, indicated that those two services were not "user-friendly" enough for high school level. On the university level, Gilreath, Dodd, and Hutchins (1984) compared BRS/After Dark with Information Access Corporation's Search Helper, a microcomputer based system which guides the user through the formulation of a search request, then "dials DIALOG, signs onto the system, conducts the search, downloads the information retrieved, signs off, and prints out the most recent citations" (p. 66). Unlike BRS/

After Dark, searches conducted by Search Helper cannot be modified while in progress; however, also unlike BRS/After Dark, Search Helper is available during all the hours of regular DIALOG operation (p. 66). Tenopir (1983) compared Knowledge Index and BRS/After Dark for university end-users using home computers, while the Business Library at Ohio State University Library used both systems for mediated searching.

A follow-up study of end-users after graduation by Bell and Halperin (1989) had the following results: "Of the 115 respondents who currently use online systems, about 43% said that all searching is done for them. Sixteen percent said that they did their own searching" (p. 40). The three systems that had been searched by the end-users before graduation were BRS, DIALOG, and Dow Jones. Cross-tabulation on the use of the systems after graduation had the following results: The results of the BRS crosstabulation were not statistically significant; the Dow Jones differences were statistically significant, as were those for DIALOG. "The Phi Correlations Coefficient of +.31 for the DIALOG crosstabulation shows that there is a weak positive correlation between searching DIALOG in school and later use of the system" (p. 40). The Phi Correlation Coefficient for the Dow Jones crosstabulation was +.1, indicating only a very weak correlation (p. 41).

Drexel University accesses BRS for its end-users via CompuVend equipment that works with either cash or a debit card reader (LaBorie

& Donnelly, 1985, p. 6). University of Ottawa Library charges by five minute "blocks" of time searched on BRS/After Dark. Governors State University Library uses mediated searching, but the requestors are not charged for online searching. Instead, a program of subsidized searching has been developed (Diodato, 1988). The Lorette Wilmot Library at Narzareth College of Rochester also uses mediated searching at no charge to requestors (Smith & Smith, 1991). Miko (1986) went over the funding for searching costs for Bowling Green State University students to access BRS and DIALOG in a required graduate level research methods course. A grant proposal used by University of Illinois to begin an end-user service was covered by Thomas (1986). Another grant proposal to fund an end-user instruction program at California State University Northridge was presented by Henry, Dodson, Magnuson, Anderson and Barrett (1988). Mader and Park (1984) detailed Memphis State University Library's proposed charging plans for end-user searching on BRS/After Dark.

Future development. A new kind of service available for end-users is defined as "local online" by O'Leary (1990). The difference from traditional online is in terms of access. Local online "means databases available at the point of use via CD-ROMs or site licenses" (p. 16). Although users perceive the service to be free, local online is very expensive for an institution (p. 30) and thus will not suit the needs of Maxwell Library. However, since the library is part of the PALS system, when the system uses "local" online, the expense becomes more

affordable since the overall cost is shared by all the libraries in the system. As Clark and Gomez (1990) described the situation, "several libraries can share the database tapes. Tapes can be loaded at one campus and searched cooperatively by more than one university. This would help defray the tremendous costs involved" (p. 242). The PALS system has recently tested an external file, ERIC, available for searching through the online catalog, and other databases are also being tested. The agreement between PALS and CARL Systems, Inc., to establish a gateway for PALS libraries to use the UnCover database was recently announced in Library Systems Newsletter (MSUS/PALS and CARL systems, 1990).

The UnCover database is an online periodical index available through the same online public access catalog used to locate books (Keeran & Angermayr, 1991, p. 65). The CARL system does not provide the subject cataloging of online catalogs nor the abstracts of DIALOG or BRS databases, but "the system does include and index any summary which appears on the contents page of the journal" (Pitkin, 1988, p. 769). As a "table of contents index" (Potter, 1989, p. [2]), UnCover's strength is in its currency. "Contents are available on the online public access catalog as soon as the journals are checked in" (Keeran & Angermayr, 1991, p. 70), without any delay for subject cataloging. Like the ERIC database available through Maxwell Library's PALS catalog, the CARL database is only a subfile of the main catalog. Cohen (1990) writes against the "separation of journal citation files from book

information files" (p. 45). The CARL database also uses a different searching approach, unlike the ERIC database on PALS, which uses the same commands as the PALS system to search. Cohen also recommends that the same search approach be used for journal citations as for books, to avoid confusing faculty and other scholars (p. 44).

The availability of these databases on the library's mainframe, which can then be accessed with the online catalog, means that remote users can be served as well (Lewontin, 1991, p. 21). The Evans Library of Texas A & M University loaded three Wilson databases onto the University mainframe, allowing faculty remote users to search both the library catalog and the periodical indexes (Clark & Gomez, 1990, p. 246).

End-users with access to local online databases will still need instruction, as indicated by three studies of transaction logs of online catalogs (Nielsen, 1986; Peters, 1989; & Hunter, 1991). Hunter stated that, "as indicated by the results of this and other studies, people do not want to take the time to learn to use the online catalog" (p. 402). Peters commented

> It is amazing that some OPAC users willingly spend hours learning the intricacies of software they want to use on their personal computers, but they grow impatient spending five minutes learning the basic commands and structure of an online catalog in the library. (p. 272)

Freshman at North Carolina State University during their first semester composition course are required to complete a library research workbook which contains a chapter on online catalog use (Hunter, 1991, p. 401). A brochure explaining the basic commands used on the online catalog is available at all terminals at the University of Missouri-Kansas City library (Peters, 1989, p. 267). Nielsen concluded from a study that students who first receive online catalog training in a classroom presentation make fewer errors than those who first receive instruction from a printed brochure (1986, p.32).

Summary

Although DIALOG has claimed to have offered its Classroom Instruction Program on the college and university level for some time (DIALOG Marketing, personal communication, April 5, 1990), the only mention of the program in library and information science literature was on the community college level. End-user searching is being taught primarily in a "hands-on" manner using one of the many database services available. The DIALOG Classroom Instruction Program was, in comparison, the cheapest database in which to teach end-users to search, and its availability during daytime hours allows greater access by students. Skills needed for database searching will need to be taught to online catalog users as more libraries add local databases to the online public access catalogs.

Chapter 3

Design, Procedures and Methodology

Procedures and Methods

Program. DIALOG CLASSMATE program, once only for high school students to learn database searching, has now been expanded for university and graduate students. DIALOG CIP, or Classroom Instruction Program, allows access to over 300 Dialog databases at one low cost rate. The hands-on experience gives students an awareness of the volume and variety of information sources available.

For the dissertation, the investigator proposed to design a class and/or classes to supplement the research classes in the various graduate programs at Winona State University and introduce database searching. This class (or classes) could someday be offered as a one-credit course that would cover several programs and would be part of a bibliographic outreach program offered by the library. With the resources presently available to Maxwell Library, however, this instruction was offered as part of established courses in research. For the purposes of this study (and the resources of Maxwell Library), the instruction was also limited to graduate students and the instructors of the research courses. This study was seen by the library as a local experiment to study the impact on the library's staff, physical resources and financial resources from a bibliographic outreach service (E. Lange, personal communication, July 3, 1990).

The results are synthesized for Maxwell Library into a six page impact statement which is included with the final report.

Subjects. Four classes offered by the Special Education Department in Fall Quarter 1990 by two different instructors were chosen to participate in this study: Research Design 561, Education of Exceptional Children 400G, Student Management Systems 405G and Special Education Administrative Procedures 420G. The reason behind this amount was the structure of the 400 level courses in Special Education. The courses have an undergraduate section and a graduate section but the classes combine both sections, with graduate students having similar but more complex assignments than the undergraduates. Therefore, the undergraduate students were given assignments that required searches on SilverPlatter ERIC on CD-ROM only while the graduate students needed to use DIALOG. Only graduate students were observed during this study.

Research Design for Fall Quarter 1990 consisted of five graduate students, Education of Exceptional Children had eight graduate students, while Student Management Systems and Special Education Administrative Procedure contained four graduate students each. Three of the graduate students were registered for another of the classes offered by the same instructor, thus the actual count of graduate students in the study was eighteen rather than twenty-one.

Training. For the introduction to DIALOG searching, the graduate students from the classes met in the Periodicals Department for a live demonstration of DIALOG searching. As Bell (1990) commented,

> A combination of computer projection technology and appropriate demonstration technique promotes dynamic interaction. Both students and instructors will benefit from an online training program that integrates a live demonstration of online searching. (p. 38)

This demonstration was improved over regular talks about DIALOG searching, as this year DIALOG has begun offering demonstration passwords (DIALOG Chronolog, 1990). The use of a demonstration password allowing free searching allowed more freedom in the demonstrated search where previously the knowledge that the library or the academic department was being charged for online time tended to restrict the demonstration in time and search terms. The planned use of the projector from the Academic Computing Department of Winona State University to display the search had to be abandoned when a cable to match the connector on the DIALOG terminal could not be found. Since the possibility existed that students in the back of the class could not see the characters on the regular terminal screen, each example demonstrated was printed and sent around the class during the course of the demonstration.

Students were provided with a handout which presented a general overview of how to prepare for a search and the use of Boolean connectors. A printout of a sample search in the five databases related to special education--ERIC, Exceptional Child Education Resources, PsycInfo, Dissertation Abstracts Online and GPO--with the uses of the various commands marked and explained was supplied to each student for later study. Students were also provided with a prompt list of DIALOG commands and, depending upon their access to an IBM-compatible computer, a copy of the PILOT disk on Basic DIALOG Searching. Turner, Kaske, and Baker (1990) recommend offline practice opportunities for online databases, as "even a brief acclimatization can result in significantly enhanced results" (p. 41), and the PILOT disk would provide that offline practice. The SilverPlatter ERIC provides offline practice, but the commands on the CD-ROM bear no similarity to those online. Thus, any practice on the CD-ROM might tend to confuse those students later searching online.

Learning objectives. The following learning objectives (Gagne, Briggs & Wager, 1988) were addressed during the demonstration:

Given access to DIALOG databases for an hour

1. classifies subject coverage of individual databases by selecting those which include proposed topic and executes logging into chosen databases.
2. adopts a search strategy by selecting search terms and using Boolean connectors (OR, AND, NOT).

3. demonstrates by entering into DIALOG the basic search commands and use of proximity operators and truncation.
4. executes modifying search results online and manipulating sets to narrow or broaden retrieval.
5. executes printing out search results.
6. executes logging out of DIALOG.

Searches. Each student then scheduled a time with the investigator when the student would be able to conduct a search in DIALOG. The investigator needed to be present in order to log the student into DIALOG using the Classroom Instruction Program password, but left the room after that point. Each student was limited to an hour of searching but did not have to use the complete hour at one time. Students had from September 17th to the end of the quarter (November 20th) in which to schedule a search, but, as the citations found in the search could be used in other class assignments, the last search was done October 30, 1990.

The timeline of activities for this dissertation is in Appendix E.

Objective

The research objective of this study was as follows:

At the completion of the project, the students in the test classes will be able to conduct online searches.

A performance indicator scale, derived from the lesson objectives and the basic skills required by other end-user programs (Sullivan, Wippern, Borgman, Weber & MacLeod, 1985; Thomas, 1986), was used

to measure how well the online search was conducted based on the technique of the actual search stored in permanent product.

Restatement of the Research Questions

DIALOG should not be viewed as "an exotic gourmet treat designed just for special people with special problems" (Quint, 1988, p. 69) but as one of many services that a library offers. End-user searching services, where offered, "have become mainstays of academic libraries, rather than mere novelties" (Rockman, 1986, p. 11). The DIALOG CIP will allow more students to learn about DIALOG service and will do so in a manner that will allow students to learn firsthand the variety of resources available as well as fostering understanding of why some searches do not always provide the results they would wish.

The amount and variety of resources that can be covered by the DIALOG Classroom Instruction Program might discourage the belief held by some faculty members of Winona State University that library resources can be covered adequately in the space of a one- or two-hour library tour. While a library tour may be sufficient to point out the most valuable indexes and resources, learning how to use an index such as Psychological Abstracts or a database service such as DIALOG takes much more time.

Discussion of Population

Of the 7,514 students enrolled at Winona State University in 1989-1990 (Dawson, 1990) on campus graduate enrollment was 287, while undergraduate enrollment was 6,084. Off campus graduate enrollment

was roughly 88 to 137 undergraduates, and Rochester enrollment had 262 graduate students to 656 undergraduates (D. Martin, personal communication, June 25, 1990). Yet, graduate students still outnumber undergraduates in the requesting of DIALOG searches (see Table 3).

Sieburth (1988) noted that undergraduates are often impatient. "If they have to sign up for a time on the computer or sit through a training session first, there are many who will choose the more familiar printed index" (p. 279). To graduate students, however, the newest developments are usually very important and online access to the latest database updates would be a critical need (p. 280).

Charles and Clark (1990) broke down the end-user population at Texas A & M University as 59% graduate students, 35.5% undergraduates, and 5.5% university faculty or staff (p. 322). A previous study at Texas A & M University studied end-users by database. Graduate students made the greatest end-user use of Agricola and Dissertation Abstracts, 52.9% and 68.4% respectively, while undergraduates used the end-user program to search Psychological Abstracts 52% as contrasted with 46.8% for graduate students (Anders & Jackson, 1988, p. 29). Graduate students were also the largest user group of online database searching at University of North Carolina (Cornick, 1989, p. 50-51).

The students involved in this study were all graduate students in the field of special education. For this reason, they had certain commonalities, even though their backgrounds and experiences may seem at first glance to be dissimilar. Graduate students at

Winona State University range from those continuing directly after completion of their bachelor degrees to nontraditional students re-entering school for additional degrees after many years in the field. Familiarity with the resources available in Maxwell Library or other libraries in the Minnesota State University System therefore varied. However, as special education students, they are interested in the same databases and use similar search terms. The initial target end-users in Janke's (1983) study were also special education students (p. 5).

Discussion of Major Variables and Their Treatment

DIALOG commands. Using the March 1985 issue of DIALOG BASICS as a starting point for the development of the CAI disk, the investigator found that the list of basic commands that a user needs to know in order to use DIALOG was very brief. Those students learning end-user searching were also not overwhelmed by directions in the various ways of searching DIALOG by descriptor, author, etc. Free-text searching has always produced the fastest results, as DIALOG searches all fields of the records. Other searchers have had similar experiences (Roose, 1986; Jack, 1988).

Training. Graduate students from Instructor 1's classes attended one of two demonstration/instruction periods. Graduate students from Instructor 2's class received an overview and brief demonstration of DIALOG searching as part of two-hour library tour. However, when students from that class scheduled a DIALOG searching time period, that

time period also included instructions covered in Instructor 1's demonstration/instruction period.

Debriefing. Students attending the test classes were debriefed at the end of the study by their instructor and informed that this was a test run of end-user searching at Winona State University. Those who wished not to participate had the option to have their results withdrawn from the study. In this manner, the requirements of human subject testings in the state of Minnesota was fulfilled (C. Blumberg, personal communication, July 17, 1990). None of the students requested to have results withdrawn.

Evaluation Design

Literature. One issue of concern was presented by Sanderson (1990): "Do end-users understand what they are searching, how they are searching, and what else is available?" (p.64) As Sweetland (1988) commented,

> The difficulty in evaluating these new systems stems from their very nature: they are directly accessed by end-users with little or no involvement or assistance from institutional staff. "Traditional" online searching tends to require a mediator, a fact which gives some access to information about the user. Current evaluation methods rely on a post-search interview, or questionnaire, given to known users of the service. The discussion of evaluation has revolved around what and how

> many questions to ask, and when and how to ask them, and not who and how to ask....the important problem in evaluation of these systems is the lack of control over the user, and subsequent lack of information about how the system was used. (p. 28)

Su (1989), in evaluating mediated online searches, determined that "user satisfaction with completeness of search results or value of search results as a whole appear to be the best single measure of successful IR [information retrieval] performance for all users under study" (p. 17). Ankeny (1991), however, determined that satisfaction with an end-user service was not a clear indicator of success in using the service (p. 356). For this reason, user satisfaction with the end-user searches was determined along with relevancy of retrieved citations.

The designers of Mann Library's program of online searching instruction at Cornell University (Thomas, 1986) identified nine basic skills as "the core of skills underlying use of any computerized information system" (p. 108). The program's instruction had to enable a student to:

identify a data base

divide a topic into concepts

select appropriate vocabulary

read a menu online

relate concepts using Boolean operators

input search strategy

manipulate sets

modify searches online

print out search results (p. 108)

The evaluation process for the program had to provide evidence that the student had acquired those skills and was able to use them.

Performance indicators. The investigator, based on prior searching experience, further research of the literature, and consultation with other librarian-searchers (H. V. Leighton, personal communication, October 4, 1990), narrowed the above list to the following basic skills or performance indicators:

identify a database

select appropriate vocabulary

relate concepts using Boolean operators

input search strategy

manipulate sets

modify searches online

print out search results

These performance indicators were examined in both the training questionnaires given to the graduate students as part of their debriefing and in the actual searches stored on hard disk.

Since the evaluation had to take into account all effects associated with this project, the evaluation needed to be goal-free.

Instrumentation

Two forms of data were collected during the course of this study. Since feedback from the student end-users was needed to modify the class for the future, a questionnaire to gauge end-user reactions was designed using a Likert scale to measure the varying degrees of intensity. According to Isaac and Michael (1981), summated behavior scales are most useful in behavioral research (p. 142). The questionnaire was not used to analyze the instruction but as a means to gather student opinion. An end-user questionnaire based on the one developed by Texas A & M University (Thomas, 1986, p. 123) was developed and modified to examine the performance indicators of this study (Appendix I). The questionnaire was pre-tested on a sample group of the students and further modified as a result of their comments to increase clarity. One question, which was not from the Texas A & M version, was how many of the students had used DIALOG before, since prior experience with the service may have an influence on determination of search terms, use of connectors, etc. A blank for the student name was left off to avoid contamination of the data by students wishing to please the instructor or the investigator. Instead, a blank was left for the date and time listed on the student's printout of the search. This allowed the questionnaire to be linked back to the search printout. Student names were listed only on the investigator's calendar for the appointment, not on the actual search.

Data gathering techniques

Another form of data, to test the value of the initial demonstration, was the searches themselves. Instructor 1's classes in the past submitted lists of the subject terms used to locate articles in the paper indexes of Resources in Education, CIJE, Exceptional Child and now the CD-ROM ERIC. As the DIALOG terminal is equipped with its communications software on hard disk, the ability to keep a disk copy of searches run for later study existed (Witiak, 1988, p. 10). Therefore, as each student logged on to search DIALOG, a file containing an actual copy of the search was set up on the hard disk for later study. In this unobtrusive manner it was possible to determine from the actual search which databases were used, what search terms were used, how many basic or advanced commands were used, etc., without influencing or intimidating the student by the investigator's physical presence. It was also possible to determine how often the same student returned. As both instructors only expected the students to find a set number of articles available in Maxwell Library (Instructor 2 requested five; Instructor 1 requested seven (Appendix F)) as a result of DIALOG searching, repeat searches were not expected to be needed.

The investigator also kept count of how often within a time period help with searching on DIALOG was requested and the types of problems encountered. This count was assessed with the performance indicators when the search results were compared with the completed questionnaires.

The investigator filled out a questionnaire for each search, assessing a rank for each searcher based upon the performance indicators used in the actual search. This rank was then compared with the pre- and post-search rankings the students assigned themselves. To avoid any possible bias or contamination, the student questionnaires were sealed and not opened until after rankings were assigned for the performance indicators of the actual searches.

Expectations

One of the expectations of this study was that the use of DIALOG, which has dropped slightly since Maxwell Library obtained ERIC on CD-ROM (see Table 2), will increase as students learn the benefits of searching online databases and the amount and variety of databases available for searching. Henry, Dodson, Magnuson, Anderson, and Barrett (1988) found that, due to the end-user instruction program offered by California State University Northridge, the online ERIC was heavily used even after a CD-ROM ERIC version was acquired by the library (p. 19). In this way, DIALOG searching at Maxwell Library might stay stable when PALS begins to offer database searching on the public access terminals.

Another expectation would be the development of this class into a course offered by the library. This development would be the beginnings of and support for bibliographic instruction courses offered by the library rather than academic departments. The present situation, with freshman English classes covering some parts of the

library and a few instructors of graduate level courses bringing their classes into the library for brief tours, has heavy emphasis on some areas of the library and little information on other resources available. A demonstrated need for bibliographic instruction courses would indicate a need for classrooms for the new library building now under consideration and a need for additional terminals for database searching. A need for an additional librarian to be in charge of bibliographic instruction would also be demonstrated by a favorable response to the DIALOG class.

Another possible expectation would be an increase in DIALOG searching but no apparent desire on the part of the students to become end-users and search DIALOG for themselves. A previous study done when DIALOG searching was free at Maxwell Library demonstrating DIALOG searching techniques using a PILOT CAI program resulted in an increase in DIALOG searching, but no students coming forward to run their own searches on DIALOG (Sullivan, 1988). However, with the addition of a CD-ROM database (not available at the library when the previous study was done), more students are learning that computerized searching is not too difficult. Anders and Jackson (1988) observed that "users introduced to CD-ROM databases frequently are interested in trying their new skills in an online environment" (p. 32).

Chapter 4

Results

From September 17, 1990, to October 30, 1990, 19 appointments were made to search on DIALOG (see Table 4). Five of the appointments were repeat sessions. Five students doubled up in searching during the same appointment session, each taking a turn on the terminal and logging into databases separately, and one of those five had two different partners over two sessions.

Questionnaire Responses

The responses to the DIALOG training questionnaires, both from students and from the investigator, are presented in Appendix J and in a different format in Appendix K.

Library experience. Of the 18 students, all but one had had some previous experience in using the resources of Maxwell Library (see Table 5 or Appendix J).

Computer experience. Of the 18 students, three had no previous computer experience: two from Instructor 1's class and one from Instructor 2's class (see Appendix J). Nine students from Instructor 1's class had had experience with microcomputers, as did four of the five from Instructor 2's class. Four students from Instructor 1's class had had experience with mainframes, but none of the students from Instructor 2's had used mainframes. Three students from Instructor

Table 4

Search Appointments

Date	Subject #
September 17	2,3
September 18	10
	8
September 19	7
	13
September 20	9
September 21	10
September 24	2,3
	7,15
September 27	5
September 28	1
	17
October 1	14
	18
October 2	4
October 11	16,15
October 17	6
October 25	12
	11
October 30	16

Note: Subjects listed on the same line searched during the same appointment.

Table 5

Responses to Questions 1-3

Library experience	
Printed indexes	13
Government Documents	6
Online catalog	7
Microfiche/microfilm	12
Interlibrary loan	7
InfoTrac/ERIC retrieval	6
No experience	1

Computer experience	
Used Microcomputer	13
Mainframe	4
Owned Microcomputer	5
Used InfoTrac/ERIC	4
Used DIALOG	0
Used online catalog	5
No experience	3

Database usage	
ERIC	17
Exceptional Child	13
PsycInfo	8
Government Publications	7
Other	7

Note: one of the three who left Question 2 blank had marked the usage of the online catalog in Question 1

1's and two from Instructor 2's class owned their own computers. Six from Instructor 1's class and 1 from Instructor 2's class had used the online catalog of the library. None had previously used DIALOG.

Database usage. Of the databases available for use by the students, ERIC was used by 17 students, Exceptional Child by 13, PsycInfo by eight, and Government Publications by seven (see Table 5). Seven students also experimented with databases not on the suggested list: Dissertation Abstracts Online (five uses), Federal Register, and Facts On File. The five students from Instructor 2's class only searched ERIC and Exceptional Child while the students from Instructor 1's class used additional databases (see Appendix J).

Citation relevancy. Fifteen students reported on the relevancy of the articles found by the searches, with 30.8 percent claiming that 75-100 percent were relevant to their topic; 15.4 percent claiming 50-75 percent were relevant; 38.5 claiming 25-50 percent were relevant; and 15.4 claiming that fewer than 25 percent were relevant.

Difficulties. End users reported encountering problems with entering databases 5.5 percent of the time, with error messages from the system 5.5 percent of the time, with system prompts 16.6 percent of the time, with entering terms 22.2 percent of the time, with connecting terms 22.2 percent of the time, and with printing citations 16.6 percent of the time. 33.3 percent reported that they had no problems.

Pre-Post Responses. Borg (1987) stated that although the single-group pre-post design is appropriate for action research projects,

> its main weakness is that since no control group is used, it is subject to most of the threats to internal validity. That is, it is not possible to determine how much of the difference between the pre- and posttest scores on the dependent variable is due to the treatment and how much is due to extraneous variables. (p. 287)

Campbell (1963) noted that in the retrospective pretest the "probable direction of memory bias is to distort the past attitudes into agreement with present ones" (p. 66).

The results of an SPSS-X test on the student responses to questions 7-17 before and after searching are listed in Appendix L. The ranking available were as follows:

0 No Experience

1 Beginner

2 Capable with much assistance

3 Capable with some assistance

4 Capable with almost no assistance

5 Independent

Student ranking of overall skills prior to DIALOG training had a mean score of .667 (SD = 1.328). Student ranking of overall skills

after DIALOG training had a mean score of 3.500 (SD = .985). (see Table 6) Histograms on responses to questions 7-17 are in Figures 1-2.

Student ranking on the physical skills of using the DIALOG terminal before the training had a mean score of 1.889 (SD = 1.451). Student ranking after the training had a mean score of 3.611 (SD = .916). Student ranking on database choice before the training had a mean score of 1.556 (SD = 1.423), while after training the mean score was 3.556 (SD = 1.042). Student ranking on the choice of subject terms before the training had a mean score of 2.000 (SD = 1.879), but after training the student ranking had a mean score of 4.056 (SD = .873). Student ranking on the use of the search commands before training had a mean score of 1.222 (SD = 1.865) and after training the student ranking had a mean score of 3.333 (SD = 1.237). Student ranking on use of the proximity and logic connectors before training had a mean score of 1.222 (SD = 1.665) and after training had a mean score of 3.611 (SD = 1.037). Student ranking on the print command had a mean score of 1.222 (SD = 1.665) before the searches were conducted and a mean score of 3.778 (SD = 1.309) afterwards.

Not all of the students assigned a ranking on the advanced commands dealing with truncation. Student ranking on the truncation commands before training had a mean score of .647 (SD = 1.272, N = 17) and after training the student ranking had a mean score of 3.294 (SD = .772, N = 17). Student ranking on the commands limiting the search by

publication year had a mean score of .833 (SD = 1.249, N = 18) before the training and after training the mean score was 3.611 (SD = 1.461). Student ranking on the commands limiting the search by language had a mean score of 1.000 (SD = 1.372) before training and a mean of 3.444 (SD = 1.097) after training.

Student ranking before training on the command to log out of DIALOG had a mean score of .667 (SD = 1.572). Student ranking after training on the logout command had a mean score of 3.278 (SD = 1.638).

Table 6

Statistics on Questionnaire Responses

	Before	$\bar{x}$	SD	N	After	$\bar{x}$	SD	N
Q7	Terminal	1.889	1.451	18		3.611	.916	18
Q8	Database	1.556	1.423	18		3.556	1.042	18
Q9	Subject	2.000	1.879	18		4.056	.873	18
Q10	Search	1.222	1.865	18		3.333	1.237	18
Q11	Connectors	1.222	1.665	18		3.611	1.037	18
Q12	Print	1.222	1.665	18		3.778	1.309	18
Q13	Truncation	.647	1.272	17		3.294	.772	17
Q14	Publ Year	.833	1.249	18		3.611	1.461	18
Q15	Language	1.000	1.372	18		3.444	1.097	18
Q16	Logging Out	.667	1.572	18		3.278	1.638	18
Q17	Overall	.667	1.328	18		3.500	.985	18

Figure 1. Histograms of student questionnaire responses before searching

Question 07 Terminal

```
COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

   5        .00  **********:**************
   3       1.00  ***************      .
   0       2.00                          .
   9       3.00  ******************:**************************
   1       4.00  *****    .
                I.........I.........I.........I.........I.........I
                0         2         4         6         8        10
                          HISTOGRAM FREQUENCY
```

Question 08 Database Choice

```
COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

   6        .00  *************:****************
   3       1.00  ***************        .
   4       2.00  *******************    .
   3       3.00  **************:
   2       4.00  *****:****
                I.........I.........I.........I.........I.........I
                0         2         4         6         8        10
                          HISTOGRAM FREQUENCY
```

Question 09 Subject Terms

```
COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

   7        .00  **********:************************
   1       1.00  *****           .
   2       2.00  **********        .
   2       3.00  **********      .
   5       4.00  **********:**************
   1       5.00  ****:
                I.........I.........I.........I.........I.........I
                0         2         4         6         8        10
                          HISTOGRAM FREQUENCY
```

Question 10 Search Command

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .40 OCCURRENCES

       11         .00  *******:********************
        2        1.00  *****    .
        0        2.00         .
        2        3.00  *****.
        1        4.00  **:
        2        5.00  :****
                      I.........I.........I.........I.........I.........I
                      0         4         8        12        16        20
                               HISTOGRAM FREQUENCY
```

Question 11 Connectors

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

       10         .00  *****************:***********************************
        2        1.00  **********           .
        1        2.00  *****                .
        3        3.00  ***********:***
        1        4.00  ****:
        1        5.00  *:***
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 12 Print Command

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

       10         .00  ****************:***********************************
        2        1.00  **********           .
        1        2.00  *****                .
        3        3.00  ***********:***
        1        4.00  ****:
        1        5.00  *:***
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 13 Truncation

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .40 OCCURRENCES

       13         .00  ***********:**********************
        0        1.00              .
        2        2.00  *****  .
        1        3.00  *:*
        1        4.00  ***
                       I.........I.........I.........I.........I.........I
                       0         4         8        12        16        20
                                 HISTOGRAM FREQUENCY
```

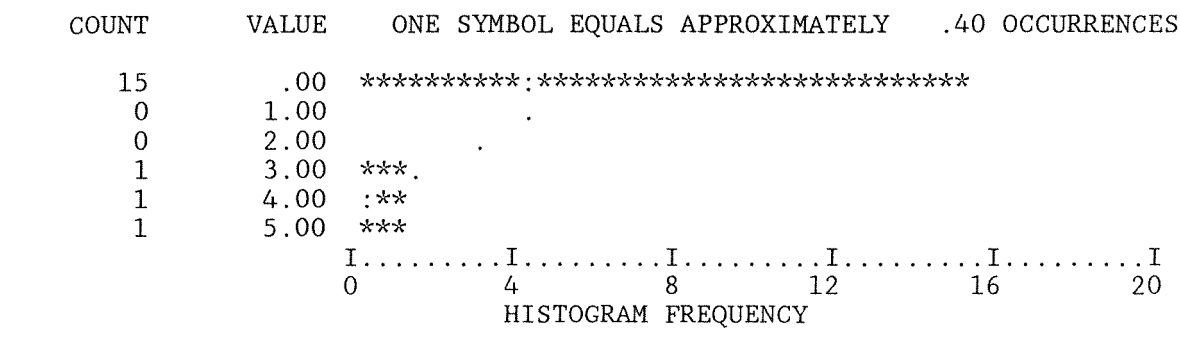
Question 14 Publication Year

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

       10         .00  **********************:****************************
        5        1.00  ************************   .
        0        2.00                     .
        2        3.00  *****:****
        1        4.00  :****
                       I.........I.........I.........I.........I.........I
                       0         2         4         6         8        10
                                 HISTOGRAM FREQUENCY
```

Question 15 Language

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

        9         .00  ********************:**************************
        5        1.00  ************************.
        1        2.00  *****                .
        1        3.00  *****   .
        2        4.00  *:*********
                       I.........I.........I.........I.........I.........I
                       0         2         4         6         8        10
                                 HISTOGRAM FREQUENCY
```

Question 16 Logging Out



Question 17 Overall Skills

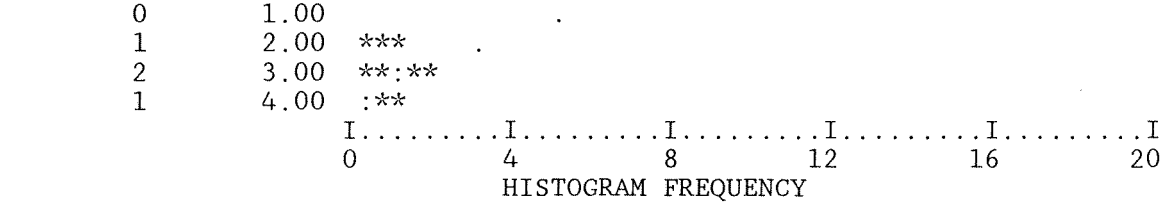


Figure 2. Histograms of student questionnaire responses after searching

Question 07 Terminal

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        2        2.00  ********:*
        6        3.00  ******************************.
        7        4.00  ***********************************:
        3        5.00  *************:**
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 08 Database Choice

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        3        2.00  **********:****
        6        3.00  ******************************:
        5        4.00  *************************     .
        4        5.00  *************:*******
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 09 Subject Terms

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        1        2.00  **:**
        3        3.00  ***************    .
        8        4.00  ****************************************:
        6        5.00  ***********************:*******
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 10 Search Command

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        2        1.00  ****:*****
        2        2.00  **********      .
        5        3.00  *************************   .
        6        4.00  *************************:*****
        3        5.00  ************:***
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 11 Connectors

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        1        1.00  *:***
        1        2.00  *****      .
        5        3.00  *************************    .
        8        4.00  ********************************:********
        3        5.00  ***************:*
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 12 Print Command

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        2        1.00  **:*******
        0        2.00            .
        5        3.00  ************************:**
        4        4.00  ********************       .
        7        5.00  ******************:******************
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

Question 13 Truncation

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .40 OCCURRENCES

        1        2.00  ***  .
       12        3.00  ********************:**********
        2        4.00  *****         .
        2        5.00  *:***
                      I.........I.........I.........I.........I.........I
                      0         4         8        12        16        20
                                HISTOGRAM FREQUENCY
```

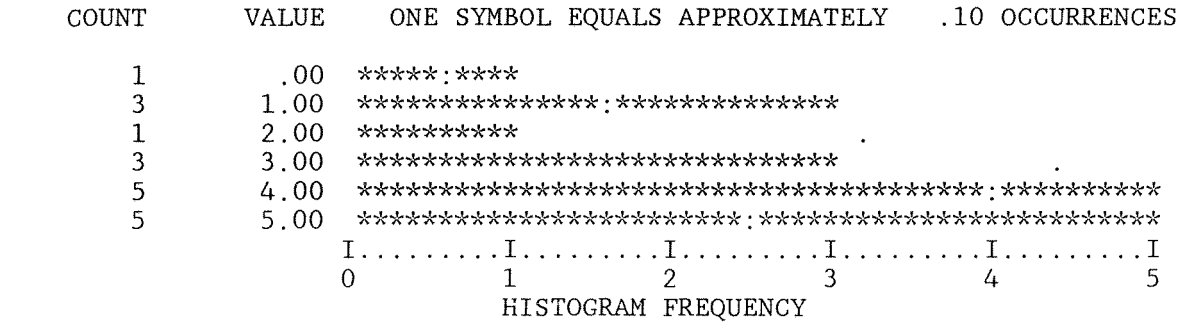
Question 14 Publication Year

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        1         .00  :****
        1        1.00  ****:
        1        2.00  *****        .
        4        3.00  ********************  .
        5        4.00  ************************:*
        6        5.00  ****************:***************
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

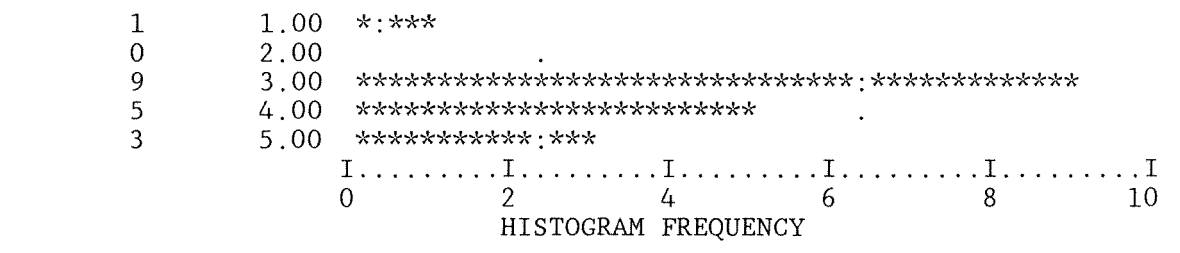
Question 15 Language

```
    COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

        1        1.00  **:**
        2        2.00  **********   .
        6        3.00  ******************************:
        6        4.00  ******************************:*
        3        5.00  ************:***
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

Question 16 Logging Out



Question 17 Overall Skills



Student's t-test. The results of a paired t-test on the responses to question 17, overall skill at using DIALOG, for the student-assigned ranking before DIALOG training and after DIALOG training had been received are listed in Appendix L. Although the other measures are important, the overall skill results were deemed the most important and thus were the only measures used in the paired t-test. Student rating of skills prior to DIALOG training had a mean score of .667 (SD = 1.328). A zero ranking was given for no experience, while a ranking of 1 was given for a beginner. Student rating of skills after DIALOG training had a mean score of 3.500 (SD = .985). A ranking of 3 was given to signify "Capable with Some Assistance," while a ranking of 4 was assigned to "Capable with Almost No Assistance."

According to Borg (1987), "most researchers use either the .05 or .01 level as the point at which they will reject their null hypothesis" (p. 139). He then stated,

> In educational research we rarely study random samples and thus cannot be sure that our error estimates are correct. To compensate for sampling errors that may be larger than we would obtain if we used random sampling, we can...use a more rigorous probability level to reject the null hypothesis, such as .01 instead of .05. (p. 144)

The .01 level was used for this study.

It was demonstrated by the results of the t-test that the difference between the before and after rankings on the questionnaire

was not due to chance, computed t = -8.97 > criterion t = ±-2.898 (alpha = .01, df = 17) (Isaac and Michael, 1981, p. 228; Sprinthall, 1982, p. 167).

MANOVA. The results of the SPSS-X Multivariate Analysis of Variance and Covariance on the questionnaire responses between the classes of the two instructors are listed in Appendices N and O. The assumption had been made earlier that no differences existed between the two classes. A MANOVA analysis was done to confirm this assumption. Chatfield and Collins (1980) state that the calculation of a MANOVA is similar to the calculation of a univariate analysis of variance (ANOVA) but that the amount of calculation from a MANOVA is much greater (p. 142). The analysis reports results for both Cochran's C and Bartlett-Box F for homogeneity of variance. Winer (1971), however, does not recommend Barlett's test "as a preliminary test on the model underlying the analysis of variance" (p. 208). For this reason, the results of Cochran's C was used instead.

The p values obtained from Cochran's C for before students began searching were .942 for question 7 (terminal usage), .913 for question 8 (database choice), .804 for question 9 (subject terms), .156 for question 10 (search command), .936 for question 11 (connectors), .936 for question 12 (print command), .724 for question 13 (truncation), .739 for question 14 (publication year), .983 for question 15 (language), .841 for question 16 (logging out), and .338 for question 17 (overall skill). The p values obtained from

Cochran's C for after students had completed a DIALOG search were .883 for question 7, .315 for question 8, .841 for question 9, .294 for question 10, .719 for question 11, .663 for question 12, .163 for question 13, .689 for question 14, .099 for question 15, .171 for question 16, and .768 for question 17.

Since none of these meet the declared alpha level, (alpha = .01), the evidence shows no difference in responses between the two groups, either before or after searching DIALOG, and a null hypothesis is accepted.

Performance indicators

Ranking. The results of an SPSS-X test on the performance indicators summarized by questions 7-17 are listed in Appendix M. The rankings assigned were as follows:

0 No Experience

1 Beginner

2 Capable with much assistance

3 Capable with some assistance

4 Capable with almost no assistance

5 Independent

The performance indicator ranking of overall student skills derived from the printouts obtained from students' DIALOG searches had a mean score of 3.722 (SD = .575) (see Table 7). Histograms of the performance indicators are given in Figure 3.

Performance indicator-derived ranking on the physical skills of using the DIALOG terminal had a mean score of 3.944 (SD = .725). The performance indicator ranking for database had a mean of 3.944 (SD = .938). On the performance indicators for subject terms, the mean was 3.944 (SD = .873). On the performance indicator-derived ranking for search command, the mean was 3.722 (SD = .958). For the performance indicator ranking for connectors, the mean was 3.611 (SD = .698). On the performance indicator for print command, the mean was 3.778 (SD = 1.060). On the performance indicator-derived ranking for logging out of DIALOG, the mean was 3.611 (SD = 1.037).

Not all of the students used the advanced commands dealing with truncation, publication year, and language. On the performance indicator for truncation, the mean was 3.700 (SD = 1.337, N = 10). On the performance indicator-derived ranking for publication year, the mean was 3.750 (SD = .886, N = 8). On the performance indicator for limiting a search by language, the mean was 4.000 (SD = 1.414, N = 4).

Table 7

Statistics on Performance Indicators

		$\bar{x}$	SD	N			$\bar{x}$	SD	N
Q7	Terminal	3.944	.725	18	Q13	Truncation	3.700	1.337	10
Q8	Database	3.944	.938	18	Q14	Publ Year	3.750	.886	8
Q9	Subject	3.944	.873	18	Q15	Language	4.000	1.414	4
Q10	Search	3.722	.958	18	Q16	Logging Out	3.611	1.037	18
Q11	Connectors	3.611	.698	18	Q17	Overall	3.722	.575	18
Q12	Print	3.778	1.060	18					

Figure 3. Histograms of performance indicators

Question 07 Terminal

```
    COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

        5       3.00  **********************:***
        9       4.00  ********************************************** .
        4       5.00  ******************:**
                      I.........I.........I.........I.........I.........I
                      0          2         4         6         8        10
                                 HISTOGRAM FREQUENCY
```

Question 08 Database Choice

```
    COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

        2       2.00  ****:*****
        2       3.00  **********              .
        9       4.00  ************************************:********
        5       5.00  ********************:*****
                      I.........I.........I.........I.........I.........I
                      0          2         4         6         8        10
                                 HISTOGRAM FREQUENCY
```

Question 09 Subject Terms

```
    COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .40 OCCURRENCES

        2       2.00  *:***
        1       3.00  ***          .
       11       4.00  ********************:********
        4       5.00  *********:
                      I.........I.........I.........I.........I.........I
                      0          4         8        12        16        20
                                 HISTOGRAM FREQUENCY
```

Question 10 Search Command

```
  COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

      2       2.00  *******:**
      5       3.00  *************************  .
      7       4.00  ***********************************:
      4       5.00  ****************:****
                    I.........I.........I.........I.........I.........I
                    0         2         4         6         8        10
                              HISTOGRAM FREQUENCY
```

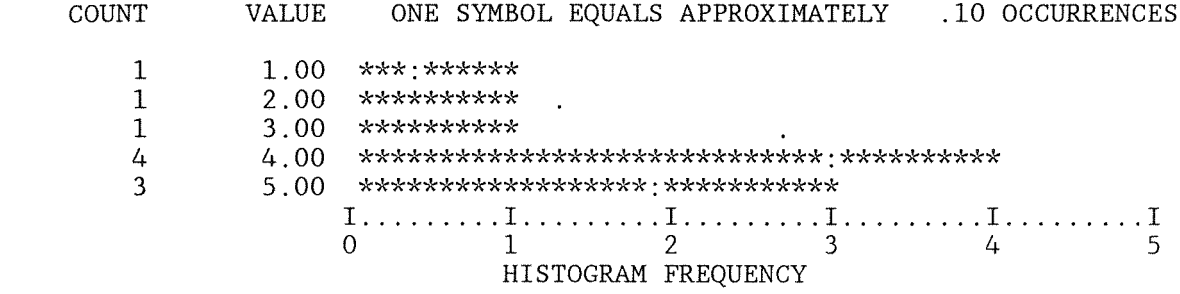
Question 11 Connectors

```
  COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

      1       2.00  ***:*
      6       3.00  ******************************    .
     10       4.00  ******************************************:********
      1       5.00  *****  .
                    I.........I.........I.........I.........I.........I
                    0         2         4         6         8        10
                              HISTOGRAM FREQUENCY
```

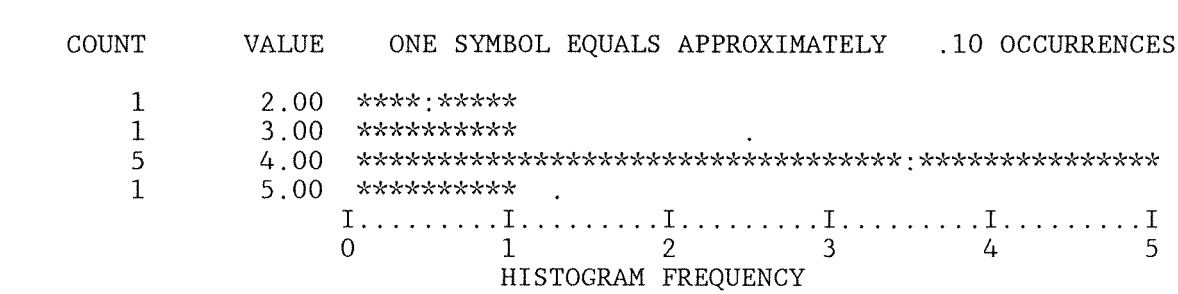
Question 12 Print Command

```
  COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

      3       2.00  *******:*******
      3       3.00  ***************       .
      7       4.00  ***********************************:**
      5       5.00  *****************:********
                    I.........I.........I.........I.........I.........I
                    0         2         4         6         8        10
                              HISTOGRAM FREQUENCY
```

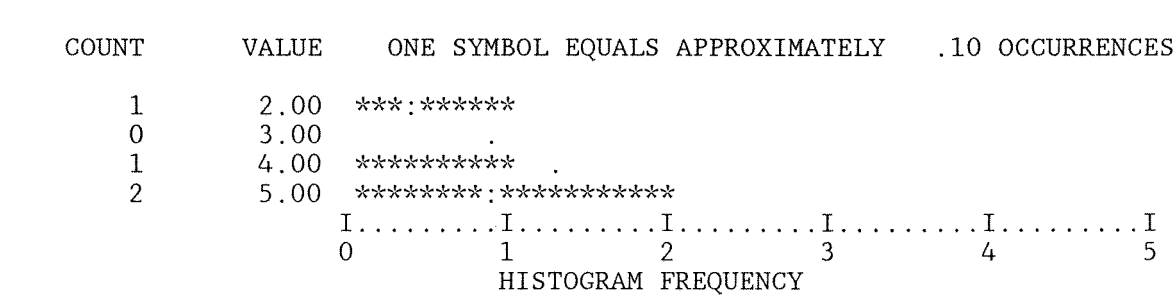
Question 13 Truncation



Question 14 Publication Year



Question 15 Language



Question 16 Logging Out

```
COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

    1       1.00  *:***
    1       2.00  *****     .
    5       3.00  *************************   .
    8       4.00  ********************************:********
    3       5.00  **************:*
                  I.........I.........I.........I.........I.........I
                  0         2         4         6         8        10
                            HISTOGRAM FREQUENCY
```

Question 17 Overall Skills

```
COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .40 OCCURRENCES

    1       2.00  :**
    3       3.00  ********      .
   14       4.00  ***************************:*********
                  I.........I.........I.........I.........I.........I
                  0         4         8        12        16        20
                            HISTOGRAM FREQUENCY
```

MANOVA. The previous Multivariate Analysis of Variance was done on students' perceptions of their skills at using DIALOG. In order to discern any difference between the two group's actual performance while using DIALOG, a MANOVA analysis was done on the performance indicators derived from the printouts obtained from students' DIALOG searches. The results of the MANOVA analyses are listed in Appendix Q. Two MANOVA analyses were done. Both were done without the results to question 15 (language), since none of the students from Instructor 2's class had demonstrated the use of the command limiting searches by language, or the results to question 14 (publication year), as only eight students had limited their searches by publication year.

The p values obtained from Cochran's C for student's actual performance were .208 for terminal usage, .000 for database choice, .000 for subject terms, .000 for search command, .000 for connectors, .000 for print command, .508 for truncation, .389 for logging out, and 1.00 for overall skills. These values are also listed in Table 8.

Since five of the p values are less than the alpha level (alpha = .01), the evidence shows difference in performance indicators between the two groups while searching DIALOG.

The MANOVA was run again without those subjects who searched together. Subject 16 was left in because that subject reported on a search that was run alone. The p values for the five indicators that had a value of .000 in the previous MANOVA were again .000 in this MANOVA (see Table 8). Since five of the p values are less than the

Table 8

Univariate Homogeneity of Variance Tests on Performance Indicators

Q07	Terminal	P = .208 (approx.)
Q08	Database Choice	P = .000 (approx.)
Q09	Subject Terms	P = .000 (approx.)
Q10	Search Command	P = .000 (approx.)
Q11	Connectors	P = .000 (approx.)
Q12	Print Command	P = .000 (approx.)
Q13	Truncation	P = .508 (approx.)
Q16	Logging Out	P = .389 (approx.)
Q17	Overall	P = 1.000 (approx.)

Univariate Homogeneity of Variance Tests on Restricted Performance Indicators

Q07	Terminal	P = .391 (approx.)
Q08	Database Choice	P = .000 (approx.)
Q09	Subject Terms	P = .000 (approx.)
Q10	Search Command	P = .000 (approx.)
Q11	Connectors	P = .000 (approx.)
Q12	Print Command	P = .000 (approx.)
Q13	Truncation	P = .566 (approx.)
Q16	Logging Out	P = .400 (approx.)
Q17	Overall	P = .819 (approx.)

alpha level (alpha = .01), the evidence shows difference in performance between the two groups while searching DIALOG.

As listed in the performance indicators given in Appendix J, 14 students demonstrated an overall DIALOG searching ability at ranking 4, "Capable with almost no assistance"; three students demonstrated a DIALOG searching ability at ranking 3, "Capable with some assistance"; and one student demonstrated a DIALOG searching ability at ranking 2, "Capable with much assistance."

Chapter 5

Discussion, Implications, and Recommendations

The major issues and research questions for this study included the following: the feasibility of offering bibliographic instruction by library staff, the possibility of improving declining DIALOG searching by giving students the opportunity to search the databases themselves and the capability of students to learn efficient searching tactics online. There are many questions that needed to be answered before end-user searching could be offered at Maxwell Library. What would be the impact of such a service on the staff? Can the present staff take on additional duties, or would it be wiser to hire an additional librarian? What might be the impact on the equipment budget? Is there a demand for such a service and how many additional terminals might be needed to cope with the demand? Would the offering of end-user searching increase the amount of DIALOG searches, or would the level of online anxiety, frustration and charges indicate that additional CD-ROM indexes would better serve patron need? How much instruction would suit an end-user's needs best? Could a student learn enough from information presented during a short instructional period to adequately search DIALOG, or would longer instructional periods and practice time increase a student's confidence and efficiency? The possible answers to these and other questions

suggested by this study, as well as the implications of those answers, are discussed throughout this chapter.

Discussion

Student rankings of searching skills did not always correspond to the performance recorded in the searches. This comparison was not included among the statistics already covered in Chapter 4 since the student rankings were perceived whereas the performances were measured. This comparison, however, does serve to indicate that student confidence may be a factor in the performance of a search. An examination of the responses from Appendix J would show that although three students ranked themselves in terms of overall skills after DIALOG training as capable of independent searching on the DIALOG databases, in terms of overall performance, none had achieved that rank. Six students perceived themselves as "Capable with almost no assistance" where performance indicators during the searches indicated 14 had reached that level. Nine students saw themselves as "Capable with some assistance" where performance indicators indicated three at that level. None saw themselves as "Capable with much assistance", although one's performance ranked at that level. However, one student did perceive overall skill as at beginner level, even though actual performance demonstrated a much higher ranking (4).

University of Ottawa librarians were reported to observe:

> Some people have great difficulty, both with searching hardware (terminal, modem access, etc.,) and with the system

> itself (commands, Boolean logic, etc.,); others manage reasonably well, while a few learn very quickly, even mastering with relative ease the essentials of Boolean logic. (Littlejohn, 1987, p. 461)

Their observations are consistent with the findings of the study.

On individual performance indicators, thirteen subjects earned at least one rating of independent (5) ability. Higher performance ranking did not appear to be dependent upon prior computer experience. The listing of subject responses in Appendix J within the two classes was by amount of computer experience in order to determine if such a connection existed. If there is a connection between prior computer experience and performance on DIALOG searching, only the negative aspect--that supplied directions are not followed--is apparent. An example of this is in the printout. SilverPlatter ERIC, as previously mentioned, was not used as an example to the students in the study because the commands on the CD-ROM ERIC had little similarity to those on the online ERIC and it was felt that any practice on the CD-ROM might confuse those students searching online. Tenopir (1984) stated "almost anyone who knows more than one system's query language gets confused at times" (p. 636). Four of the students who had checked SilverPlatter ERIC experience on their questionnaires did indeed experience confusion with the online commands and tried to enter SilverPlatter commands instead.

One student with previous computer experience misspelled one term in the search, was fortunate enough to find three records in the database with the same misspelling, logged into a second database and continued to misspell the search term. The misspelling was not caught during the search and the student did not ask the investigator why so few records had been found on what was normally a topic with many citations. This may have been an instance in which the student's prior skill was a handicap. As Tenopir (1984) commented, "The tendency at first is to accept the computer's word that there is no information on a subject, rather than to examine their search strategy for flaws" (p. 636).

Despite such minor problems, the objective of this study was obtained. Students did learn to search DIALOG and were able to print out citations on subject terms they had chosen and entered.

Implications

Staff. The implementation of a DIALOG Classroom Instruction Program at Winona State University will mean the involvement of library staff in training. As Sanderson (1990) commented on a DIALOG end-user experiment at the University of Florida, "Our experience at Florida suggests that the idea that someone can sit in front of a terminal or personal computer and search a system with no training is ludicrous. The end-user's time is wasted without some training and direction" (p. 65).

The question becomes, how much training is enough? If training is limited to the amount given in this study, then the library must be prepared to have staff members available to help answer questions during the searches. This study has demonstrated that students can learn to search after a limited amount of training, but, in general the students range in capability from those able to search with very little assistance to those requiring much assistance. Tenopir (1984) noted, "Learning to do online searching is in most cases not particularly difficult, but it involves memorizing a query language and sometimes learning to think in new patterns" (p. 635).

Outside of teaching responsibilities, Gilreath, Dodd, & Hutchins (1984) found that the reference staff, both professional and non-professional, performed three functions: traffic controllers, technicians--logging patrons on to the system, maintaining session statistics and resolving any equipment problems--and consultants (p. 71). Friend (1985, p. 141; 1988, p. 101) and Lewontin (1991, p. 22) also point out the need for librarians as consultants for end-users.

Mader and Park (1984), in recommending that Memphis State University continue its BRS/After Dark end-user search service, presented the staffing needs for both full scale service and minimum service. Both versions listed a professional librarian and a student worker assigned to the service (p. 11-12). Sieburth (1988) mentioned "If patron fees are collected, there is additional management

responsibility for handling the money, figuring charges,and keeping records" (p. 296). Gilbreath, Dodd and Hutchins (1984) noted that due to the physical arrangement of the equipment and the heavy patron load

> ...staff assignments were adjusted in order to have one person stationed in the computer terminal area on evenings when the services were made available. This arrangement proved to be much more satisfactory both in reducing staff frustration and in providing timely assistance to patrons. (p. 71)

Sieburth (1988) commented,

> Staff time will be required to assist patrons with the database systems. Even simple procedures will often generate some questions. Setting up for the day, putting away at night, assisting with online or offline procedures, hiring and training students to oversee the operation will be added responsibilities. (p. 294)

Diodato (1988) commented that an increase in online searches caused more interlibrary loan requests (p. 149), which will also have an impact on Maxwell Library's staff. Rockman (1986) reported a similar increase in interlibrary loan requests (p. 17).

Cost. The cost of the program depends upon how many students are involved. The estimate in Appendix H listed a possible maximum cost of $465.00 for 31 students limited to one hour of searching ($15) each. The actual cost of the program came to $215.72, which was less

than the total amount of students involved in the program (18) times the cost of one hour of searching (x $15 = $270).

One performance indicator not examined during this study was the amount of time spent online. Students were limited to an hour of searching, but professional searchers seldom need that much time in order to perform an effective search. This factor may have an bearing in future classes. An end-user study at Pennsylvania State University had limited student participants to a 40-minute search. Students averaged 30 minutes online, with a range between 4.32 to 58.14 minutes (Friend, 1985, p. 138).

DIALOG CIP can only be used in conjunction with formal, supervised programs to teach online searching (DIALOG Marketing, personal communication, September 4, 1990). Once end-users have been trained, they will have to use the full version of DIALOG or Knowledge Index, and Maxwell Library currently charges for online searching. Sieburth (1988) commented,

> Online systems that will charge to credit cards provide one method of collecting fees. A vending system that automatically logs on and off and allows a defined period of search time is another. Otherwise, monitoring time, printing and collecting cash can require a great deal of time. (p.292-293)

Equipment. Additional terminals will be needed to provide more access, both for the CIP students and for trained end-users, which in turn means more phone lines and space for workstations. Several

librarians involved in end-user training (Batista & Einhorn, 1988; Bell, 1990; Wright & Friend, 1991) also recommend using computer workstations with video projectors for more successful instruction in a group setting. The workstation used by Penn State (Wright & Friend, 1991) consists of a single unit housing the computer and monitor, overhead projector, modem, CD-ROM drive and printer, as well as containing modest work space and storage, and is mobile enough to be taken out of the building as part of a "road show" demonstrating online and CD-ROM searches in classroom buildings or faculty offices (p. 75). After the failure of Winona State University's Computer Services to provide cables compatible with the terminal for the DIALOG system, Maxwell Library should consider obtaining its own workstation or video projector.

Recommendations

The comments of the students involved in the DIALOG Classroom Program, both at the end of the questionnaire and given verbally at the end of DIALOG searches, indicate that having the DIALOG Classroom Instruction Program available would be beneficial for Winona State University students. As Rockman (1987) stated, the traditional teaching role of the library has changed. The goal today is to teach patrons how to tap into any information source (p. 10). Mader and Park (1984) commented, "increasingly, some information will be available only online" (p. 13). Maxwell Library needs to establish

itself as a provider of online information sources and as a consultant and training resource for users who wish to access such sources.

The instructor of an engineering class at Winona State has already inquired about the possibility of DIALOG CIP being available for that class. At other libraries, the growth in end-user searching has had a positive impact on the library's public image and the relationship between library staff and researchers (Burris & Molinke, 1991, p. 39). Sieburth (1988) listed as reasons to offer end-user searching "...To attract students to the library and to increase their interest in information retrieval...[and]...To generate excellent publicity for the library" (p. 276-277).

Whether or not to continue the DIALOG Classroom Instruction Program would be dependent on the library department's perception of this service. Should this service be taught individually to those who wish to learn? At the Lippincott Library of the Wharton School, University of Pennsylvania (Littlejohn, 1987), "the library staff invariably walked first- and second-time users through their searches. Because of the high number of first-time users...this amounted to a considerable expediture of time" (p. 462).

Should the library department teach its own courses? Before 1976, when Winona State University discontinued a Library Science minor, librarians taught courses at Winona State University (E. Jacobsen, personal communication, July 1978). Librarians at Winona State University in recent years have taught classes in other

departments of the university outside of the library department (R. Dennison, personal communication, June 28, 1991). To add a class to the university curriculum, the library would have to first submit the class proposal to the university's Academic Affairs Curriculum Committee for review and approval. Or the library department could offer a class for one quarter on a trial basis, to first establish the amount of demand, before the proposal is sent to the committee (S. Bennett, personal communication, April 13, 1990).

Should this service be linked instead to existing research courses? Until a better indication of demand for this service is established, and until the library has classrooms (i.e., in a new building), the best manner of presentation will be as part of an existing course. At that point, the question of who pays for the program could be dependent upon how much individual academic departments would be willing to contribute. As White (1991) noted, "Because they don't have the budgeted funds to pay for them, academic libraries have begun passing on the cost of online searches to their user departments" (p. 268). With the current budget shortfalls in education in Minnesota, the library should not have to bear the complete financial cost.

The next question, that of how much training is enough, would be dependent upon what the individual instructor will be requiring of the students. If the students only need to find a small amount of articles, then the amount of training given in this study may be

enough. If, however, students will be required to search DIALOG as part of a major research project or thesis, then training should be more extensive and additional time for online practice should be provided. Sanderson (1990) also found "hands-on" training valuable for the students at the University of Florida (p. 65). Juhl and Lowry (1990) found that, after training sessions, "most users needed some online time in order to begin to grasp the logic [emphasis theirs] of searching and to formulate search strategies" (p. 74). Two students involved in this study commented that additional time would be helpful (see Appendix J).

Summary

This study served as an initial inquiry on the impact on the library's staff, physical resources and financial resources from a bibliographic outreach service, using DIALOG's Classroom Instruction Program to teach end-users to search on DIALOG. The study was designed to address the following research objective:

At the completion of the project, the students in the test classes will be able to conduct online searches.

Review of the work of other librarians who teach end-user searching on the university and high school level resulted in the observation that use of DIALOG CIP has been reported on the high school and community college level, but not the university level. Yet DIALOG CIP is one of the lowest priced databases.

A study was conducted with research classes offered by two professors in the field of special education on whether the information presented in an instruction session based on six learning objectives--choosing a database, choosing search terms and connectors, using search commands, modifying the search online, printing search results, and logging out--would enable graduate students to conduct an online search. Rockman (1987) stated that the advantage of course-integrated instruction is that users are motivated to learn retrieval skills when the focus is on a specific information need within the context of an already established class assignment (p. 12). The students involved in the study did learn to search DIALOG databases and print out citations on their topics. Student responses on a questionnaire were favorable towards the service.

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Appendix A

Full Names of Acronyms

BRS - Bibliographic Retrieval Services

CARL - Colorado Alliance of Research Libraries

CD-ROM - Compact Disk - Read Only Memory

CIJE - Current Index to Journals in Education

DIALOG CIP - DIALOG Classroom Instruction Program

ERIC - Educational Resource Information Center

MANOVA - Multivariate Analysis of Variance and Covariance

MSUS/PALS - Minnesota State University System's Project for Automated Library Systems (MSUS/PALS and CARL Systems, 1990, p. 82)

OCLC - (depending upon time period)

Ohio College Library Center (Kent & Lancour, 1977, p. 346-347)

Ohio Center for Library Cataloging

Online Computer Library Center

OCLC Online Computer Library Center (Lucas, 1990, p. 907-908)

OPAC - Online Public Access Catalog

PALS - Project for Automated Library Systems

PILOT - Programmed Inquiry, Learning Or Teaching

RIE - Resources In Education

Appendix B

Feedback

MESSAGE DISPLAY

TO KATHRYN SULLIVAN:WIN

From: JOANN ISDER:ROC Acting for: Marj Smith
Postmark: Oct 19,88 12:31 PM
Subject: Reply to: Dialog program

Reply text:
From JOANN ISDER:
Yes, Marj would like a smaller disk. Also could use small disks in Winona Nursing Lab and 5 1/2" disk for RCC library. Marj will be calling you on Friday or Monday to discuss this further with you.

TO: Kathy Sullivan
FROM: Barb Hammes

DATE: 12-12-88

Kathy,

Thank-you for coming to our N475-Nursing Research class last Friday. The knowledge you had & the manner in which you presented it was invaluable to the students. By actually bringing samples of various indexes & abstracts, we could all begin learning how to carry through a review of the literature.

Thank-you in particular for the copy of the computer program which describes the use of "Dialog".

You have made use of your library materials appear user friendly! Be prepared to continue seeing nursing students & faculty utilizing your department!

Appreciatively,
Barb Hammes

Note: photocopy of actual memo will be delivered.

Appendix C

Handout 1

Database Searching

Database searching is a means of finding

a) books and journals on a particular topic;
b) corporate background;
c) quotations from the Bible;
d) an encyclopedia article;
e) all of the above

Explanation of database searching

1. Databases

There is a large number of databases available for online or CDROM searching. Not only are there the electronic equivalents of journal indexes such as THE CURRENT INDEX TO JOURNALS IN EDUCATION (CIJE), BUSINESS PERIODICALS INDEX, or PSYCHOLOGICAL ABSTRACTS, but there are also databases indexing patents, trademarks and logos, census figures, grants, or associations, to name but a few. Even the Bible and several encyclopedias have their own databases.

2. Vendors

Not only are there many types of databases, but there are also many ways of accessing those databases. Some individual databases can be searched directly, but often you will hear of searching databases through a service, like Dialog, BRS, or ORBIT.

Dialog is available at Maxwell Library. Dialog has over 300 databases available for searching, including ERIC (education), PsycINFO (psychology), Exceptional Child Education Resources, Dissertation Abstracts Online, and GPO (government publications). Charges for database searching depends upon the particular database, how long the search runs, and how many records are displayed.

The Library also has a CDROM version of InfoTrac's General Periodicals Index and ERIC. There is no charge for CDROM searches.

Database Searching, cont.

Preparation for searching

The best beginning to preparing for a database search is to have a clear idea of what your topic is. There are a few ways of doing so for a search.

1. Descriptors

This term refers basically to the subject headings used by the paper indexes. If you have access to the paper version of the database you wish to search, it helps to see what subject headings are used for your topic. That way, you know whether "hyperactive" or "hyperactivity" is the more commonly used term.

But what do you do when there are no paper copies of the index?

2. Keywords

A "keyword" is any word that the articles you search for MUST contain. Searching by keyword, unlike searching with descriptors, searches the entire record in the database: title, author, abstract, descriptors, and full text (if you are in one of the full text databases).

Keyword searching has some disadvantages, though. For example, if you were looking for articles on attention deficit disorders under "attention disorders", any article that mentioned attention deficit disorders but didn't shorten the phrase would not be picked up.

Likewise, using "attention deficit disorders" by itself might not pick up the older articles that only used the term "hyperactivity".

Which brings us to....

3. Connectors

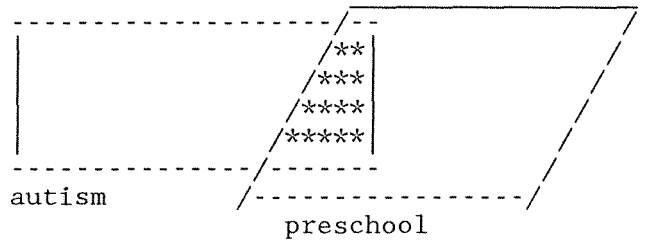
The main "connectors" used in database searching are

OR AND NOT

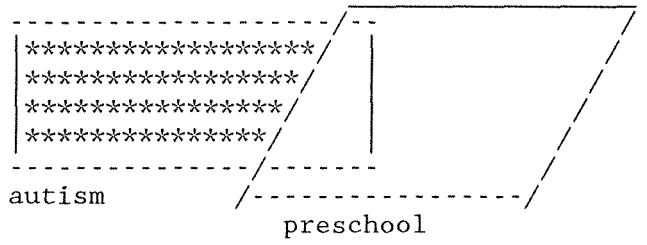
There are others, but these are the important ones. Database searching uses Boolean logic to create and combine sets of records.

Database Searching, cont.

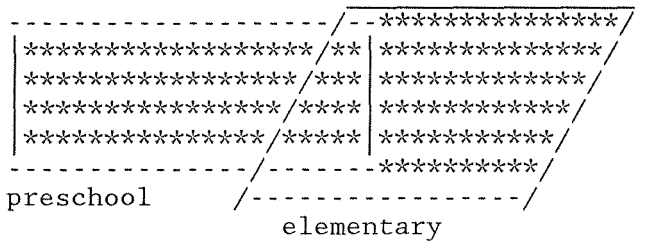
Boolean logic deals with the linkage of sets



** is the overlap of autism AND preschool



** is autism NOT preschool



** is preschool OR elementary

Database Searching, cont.

So, for example, we have searched under the keywords "attention deficit disorders" and created one set of records. But we also want the older records that only use the term "hyperactivity". To put both sets together and not lose anything, the terminology would be

attention deficit disorders OR hyperactivity

If instead you wanted only those records that mentioned both terms, it would be

attention deficit disorders AND hyperactivity

preschool OR elementary

is a large set of records that also includes secondary school. If you didn't want articles on secondary school, the NOT connector could be used to eliminate those articles.

NOT secondary

Other connectors vary between vendors, such as () indicating a phrase (i.e., attention()deficit()disorders).

4. Results

What type of results do you need? A bibliography? Citations plus abstracts? Do you want the results on paper? On disk? How many articles do you need to find and do you have alternate keywords in case your main ones do not result in enough articles? What language (if you are searching in an international database) do you want the articles in? Did you need articles from only a particular span of years?

It may sound odd to say that you prepare for a search by planning for the results, but this should be considered as well.

Appendix D

Handout 2

```
Welcome to DIALOG
Dialog level 24.01.4A

Last  logoff  17jul90 11:41:23
Logon file001 23aug90 15:48:46
COPR. (c) DIALOG INFORMATION SERVICES, INC. ALL RIGHTS RESERVED.
NO CLAIM TO ORIG. U.S. GOVT. WORKS.

  New: ROCKY MOUNTAIN NEWS (PAPERS) (File 641)
  New: JOURNAL OF COMMERCE (File 637)
  New: QUOTATIONS DATABASE (File 175)
  Reload: AMERICAN LIBRARY DIRECTORY (File 460)


     >>> Enter BEGIN HOMEBASE for Dialog Announcements <<<
     >>>    of new databases, price changes, etc.      <<<
     >>>     Announcements last updated  20aug90       <<<


File   1:ERIC _ 66-90/AUG.

      Set  Items  Description
      ---  -----  -----------
?

? ss mainstreaming                          [ss (select set) command]

     S1    5308  MAINSTREAMING  (PROGRESSIVELY INCLUDING AND MAINTAINING
                 EXCE...)
? ss elementary and secondary               [ 'and' narrows set]

     S2  147879  ELEMENTARY
     S3  161148  SECONDARY
     S4   92373  ELEMENTARY AND SECONDARY
? s s2 or s3                                [ 'or' broadens set]

         147879  S2
         161148  S3
     S5  216654  S2 OR S3
? s s1 and s4

           5308  S1
```

```
          92373  S4
     S6    1912  S1 AND S4
? s s1 and s5

          5308  S1
        216654  S5
     S7    3228  S1 AND S5
? s py=1987:1990                          [select publication year=
                                                 beginning year:ending year]
     S8   86137  PY=1987:1990
? s s6 and s8                             [combine subject set with year set]

          1912  S6
         86137  S8
     S9     354  S6 AND S8
? ss s9 and attention()disorders          [use () between words of a phrase]

           354  S9
    S10   15878  ATTENTION
    S11    4768  DISORDERS
    S12       9  ATTENTION(W)DISORDERS
    S13       0  S9 AND ATTENTION()DISORDERS
? t9/7/1-3                                ['type' or display command:
                                             tsetnumber/format/recordnumbers]

 9/7/1
EJ406350   TM514962
  Research on Cooperative Learning: An International Perspective.
  Slavin, Robert E.
  Scandinavian Journal of Educational Research, v33 n4 p231-43  1989
  Available from: UMI
  Language: English
  Document Type: JOURNAL ARTICLE (080); REVIEW LITERATURE (070); EVALUATIVE
REPORT (142)
  Journal Announcement: CIJAUG90
  Research is reviewed concerning the cooperative learning methods most
widely researched in studies comparing cooperative and traditional methods.
Several cooperative learning methods are described. Outcomes reviewed
include academic achievement, intergroup relations, mainstreaming, and
self-esteem. (TJH)

 9/7/2
EJ405312   EC222792
  Parent Checklist for Placement of a Hearing-Impaired Child in a
Mainstreamed Classroom.
  Goldberg, Donald; And Others
  Volta Review, v91 n7 p327-32 Dec  1989
  Available from: UMI
```

Language: English
Document Type: JOURNAL ARTICLE (080); TEST, QUESTIONNAIRE (160)
Journal Announcement: CIJAUG90
Target Audience: Parents
The Parent Checklist was developed for parents of hearing-impaired children to use when evaluating prospective mainstreamed classrooms. Areas of assessment include: physical environment, teacher, attitude of school, information regarding the student, and special services. (Author/PB)

9/7/3
EJ405246 EC222676
Addressing Individual Differences in the Classroom: Are We up to the Job? A Discussion of the Issues.
Kavale, Kenneth A.
Teacher Education and Special Education, v12 n4 p179-82 Fall 1989
Available from: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); REVIEW LITERATURE (070); POSITION PAPER (120)
Journal Announcement: CIJAUG90
The paper provides an overview of issues concerned with individual student differences including disabilities. Such issues concern: philosophical dilemmas in individualization, needed changes in methods instruction, effective inservice training and individualization, and state and university partnerships. (DB)
? b 54 [begin a new database]

23aug90 15:53:30 User094781 Session A129.1
$2.49 0.083 Hrs File1
$0.30 3 Type(s) in Format 5
$0.30 3 Types
$2.79 Estimated cost File1
$0.83 Dialnet
$3.62 Estimated cost this search
$3.62 Estimated total session cost 0.083 Hrs.

File 54:ECER/EXCEP CHILD - 66-90/APR

Set	Items	Description

? ss autism or autistic

S1	1652	AUTISM
S2	1416	AUTISTIC
S3	1797	AUTISM OR AUTISTIC

? ss preschool

S4	4918	PRESCHOOL

```
? s s3 and s4

          1797  S3
          4918  S4
     S5    128  S3 AND S4
? s py=1988:1990

     S6   3614  PY=1988:1990
? s s5 and s6
           128  S5
          3614  S6
     S7     17  S5 AND S6
? t7/7/1-5                                [format 7 includes abstract]
```

7/7/1
EC220585 ED309594
Autism. Bibliography #26.
Illinois Public Health Association, Springfield. Illinois Birth to Three Clearinghouse.
1989-Jan 8+P.
SPONSORING AGENCY: Governor's Planning Council on Developmental Disabilities, Springfield, Ill.
DOCUMENT TYPE: 131
GEOGRAPHIC SOURCE: U.S.; Illinois

The bibliography lists books and journal articles which are available on loan (to Illinois residents only) from the Illinois Birth to Three Clearinghouse. The 79 items listed focus on many aspects of autism, such as diagnosis, possible genetic links, social and pragmatic deficits, sleep problems, developmental therapy, drug therapy, behavior management, communication training, curriculum development, and teaching methods. The references describe materials for both professionals and parents and provide the following information: author, title, journal title or book publisher, date, and call number to use in accessing the item at the Clearinghouse. (JDD)

7/7/2
EC220547 ED308674
Early Intervention for Children with Disabilities: The Australian Experience.
Pieterse, Moira, Ed. And Others
Macquarie Univ., North Ryde (Australia). Special Education Centre.
1988- 394+P.
REPORT NO.: ISBN-0-85837-623-7
DOCUMENT TYPE: 141; 010
GEOGRAPHIC SOURCE: Australia; New South Wales

A collection of papers on the Australian experience with early intervention for children with disabilities gives regional overviews, describes specific intervention programs, and discusses a variety of issues. Overviews are given of early intervention in Australia in general, New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, and the Northern Territory. Topics of program descriptions include: the Down Syndrome program at Macquarie University; early education and integration for children with intellectual disabilities; hearing and hearing loss; visually impaired children; a New South Wales cerebral palsy program; the Autistic Association of New South Wales; early language intervention; communication camps; a University of Western Australia program; a rural community's child/parent support initiative; a rural distance education approach; a home-based teaching program; a program for urban migrant families; services in New South Wales preschools; and a toy library. Early intervention issues addressed separately include the working relationship between parents and professionals; teaching parents to be direct instructors and child advocates; integration of quality care and education; manual communication for hearing-impaired and autistic children; early special education teacher training; alternative and controversial treatments of Down Syndrome; evaluating early intervention programs; and the efficacy of early intervention with Down Syndrome. (MSE)

7/7/3
EC220509 ED308646
Unexpected Communication Attainments by Persons Diagnosed as Autistic and Intellectually Impaired.
Crossley, Rosemary
DEAL Communication Centre, Caulfield. (Australia)
1988-Oct 17+P.
DOCUMENT TYPE: 141
GEOGRAPHIC SOURCE: Australia; Victoria

The paper describes the effects of a communication training program provided at the DEAL Communication Center in Victoria, British Columbia, to 34 clients with diagnoses of autism or intellectual impairment with autistic tendencies. Client ages ranged from preschool to adult with most being between 6 and 18 years old. The treatment module consists of three 2-hour sessions with most clients receiving more than one module. Assessment utilized a highly motivating voice-output computer. Training involved physical hands-on guidance by the trainer with the ultimate goal of fully independent communication using any appropriate strategy (speech, sign, communication displays, or spelling.) Nine of the group attained fluent independent communication by spelling with an additional 14 communicating well with facilitation. Some spelling clients use voice output communication aids and most use mini-typewriters or small alphabet boards. Manual signing and finger spelling is used by only one client.

The most time consuming aspect of the training was generalization to other communication partners and locations. Results have implications for the diagnosis and prognosis of persons with the neurological damage interfering with expression that is usually termed autism. (DB)

7/7/4
EC220350
Communicative Profiles of Preschool Children with Handicaps: Implications for Early Identification.
Wetherby, Amy M. And Others
Journal of Speech and Hearing Disorders v54 n2 p148-58 May 1989; 1989-May 11P.
UMI
EDRS: NOT AVAILABLE
DOCUMENT TYPE: 080; 143

The study identified communicative patterns of preschool children (N=11) with handicaps (Down syndrome, specific language impairments, and autism). Down syndrome children were like normal children of the same language stage on all parameters whereas autistic children scored outside the normal range on all but one parameter. (Author/DB)

7/7/5
EC220144
Promoting Social Interaction through Teaching Generalized Play Initiation Responses to Preschool Children with Autism.
Haring, Thomas G.; Lovinger, Laurie
Journal of the Association for Persons with Severe Handicaps v14 n1 p58-67 Spr 1989; 1989-Spr 10P.
EDRS: NOT AVAILABLE
DOCUMENT TYPE: 080; 142

Two experiments compared effects of play initiation training on subsequent social interactions between preschool/kindergarten students with severe disabilities and their nonhandicapped peers within play contexts. Training the disabled child in social initiation and play skills was more effective than providing awareness activities and rewards to nonhandicapped peers initiating interactions. (Author/DB)
? t7/3/6-9 [format 3 gives only citation]

7/3/6
EC220060
Misleading Cues in the Diagnosis of Mental Retardation and Infantile Autism in the Preschool Child.
Myers, Beverly A.

Mental Retardation v27 n2 p85-90 Apr 1989; 1989-Apr 6P.
UMI
EDRS: NOT AVAILABLE

7/3/7
EC212945
Language and Communication Disorders in Children. 2nd Edition.
Bernstein, Deena K.; Tiegerman, Ellenmorris
1989- 492P.
Merrill Publishing Co., 1300 Alum Creek Dr., Columbus, OH 43216 ($32.95).
EDRS: NOT AVAILABLE

7/3/8
EC212767 ED305816
Severe Behavior Disorders of Children and Youth. Volume 11.
Rutherford, Robert B., Jr., Ed.; Maag, John W., Ed.
Council for Children with Behavioral Disorders. Teacher Educators for Children with Behavioral Disorders.
1988- 194+P.
Robert B. Rutherford, Jr., Ph.D., 305 Farmer Building, College of Education, Arizona State University, Tempe, AZ 85287 ($12.00). Make check payable to Council for Children with Behavioral Disorders.

7/3/9
EC212152
Annual Progress in Child Psychiatry and Child Development.
Chess, Stella, Ed. And Others
1989- 686P.
Brunner/Mazel Publishers, 19 Union Sq., New York, NY 10003 ($50.00).
EDRS: NOT AVAILABLE
? b 11 [begin a new database]

23aug90 15:56:28 User094781 Session A129.2
$2.25 0.050 Hrs File54
$0.80 4 Type(s) in Format 3
$1.00 5 Type(s) in Format 7
$1.80 9 Types
$4.05 Estimated cost File54
$0.50 Dialnet
$4.55 Estimated cost this search
$8.17 Estimated total session cost 0.133 Hrs.

File 11:PSYCINFO - 67-90/SEP
(COPR. AM. PSYCH. ASSOC.)

Set Items Description
--- ----- -----------

```
? ss attention()deficit()disorder?        [use () to indicate a phrase;
                                           use ? to include singular or plural]
     S1   19919  ATTENTION
     S2    5345  DEFICIT
     S3   63897  DISORDER?
     S4     839  ATTENTION()DEFICIT()DISORDER?
? ss elementary

     S5   26965  ELEMENTARY
? s s4 and s5

           839  S4
         26965  S5
     S6     44  S4 AND S5
? s s4 and children

           839  S4
        106382  CHILDREN
     S7     656  S4 AND CHILDREN
? s py=1988:1990

     S8   80880  PY=1988:1990
? s s6 and s8

            44  S6
         80880  S8
     S9      9  S6 AND S8
? s s9/eng                                [in international databases, limit
                                             by language]
    S10      9  S9/ENG
? s s7/eng                                [additional demonstration]

    S11    643  S7/ENG
? t10/7/1-3


 10/7/1
00745490           77-06481
  Normative data on the IOWA Conners Teacher Rating Scale.
  Pelham, William E.; Milich, Richard; Murphy, Debra A.; Murphy, H.
Allen
  U Pittsburgh, Western Psychiatric Inst & Clinic, PA, US
  Journal of Clinical Child Psychology
  1989 Sep Vol 18(3) 259-262
  Coden: JCCPD3        ISSN: 0047228X
  Journal Announcement: 7703
  Language: English
```

Document Type: JOURNAL ARTICLE
Composite Age: CHILD
Obtained ratings on the IOWA Conners Teacher Rating Scale of J. Loney and R. Milich (1982) for 293 boys and 315 girls from kindergarten through 5th grade in 2 elementary schools. Means, standard deviations, and suggested cutoff scores were reported by grade and sex for this sample on the Inattention/Overactivity and the Aggression (Oppositional/Defiant) subscales. Significant grade and sex effects produced lower mean scores for older children and girls. Implications for differential diagnosis of attention deficit and conduct disorders are addressed. (PsycINFO Database Copyright 1990 American Psychological Assn, all rights reserved)

10/7/2
00734813 27-54633
Videotape self-modeling in the treatment of attention-deficit hyperactivity disorder.
Woltersdorf, Mitchel A.
Fuller Theological Seminary, School of Psychology, CA, US
Dissertation Abstracts International
1990 Jan Vol 50(7-A) 1997
ISSN: 04194209
Journal Announcement: 2708
Language: English
Document Type: DISSERTATION
Composite Age: CHILD
Subfile: DBO

10/7/3
00706457 27-50130
A cognitive-behavioral intervention for impulsive, attention deficit disordered children.
Sullivan, Kathryn A.
Texas A&M U, US
Dissertation Abstracts International
1989 May Vol 49(11-A) 3314
ISSN: 04194209
Journal Announcement: 2701
Language: English
Document Type: DISSERTATION
Composite Age: CHILD
Subfile: DBO
? b 35 [begin a new database]

23aug90 15:59:34 User094781 Session A129.3
$3.63 0.066 Hrs File11
$1.05 3 Type(s) in Format 7
$1.05 3 Types

```
    $4.68  Estimated cost File11
    $0.66  Dialnet
    $5.34  Estimated cost this search
   $13.51  Estimated total session cost   0.200 Hrs.

File  35:DISSERTATION ABSTRACTS ONLINE 1861-SEP 90
        (Copr University Microfilms)

      Set  Items  Description
      ---  -----  -----------
? ss emotional()disorder?

      S1    7555  EMOTIONAL
      S2    6051  DISORDER?
      S3      59  EMOTIONAL()DISORDER?
? ss elementary

      S4   23322  ELEMENTARY
? s s3 and s4

           59  S3
        23322  S4
      S5    2  S3 AND S4
? t5/7/1-2


 5/7/1
0993031  ORDER NO: AAD88-05829
THE EFFECT OF AN EIGHT-WEEK SUMMER SCHOOL PROGRAM ON READING PERFORMANCE OF
SEVERELY EMOTIONALLY-DISTURBED STUDENTS
  Author:  FRANKLIN, MARY ELIZABETH
  Degree:  PH.D.
  Year:    1987
  Corporate Source/Institution:  SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE
(0209)
  MAJOR PROFESSOR: JAMES A. TESKA
  Source:  VOLUME 49/05-A OF DISSERTATION ABSTRACTS INTERNATIONAL.
           PAGE 1113.  97 PAGES

    This investigation employed a group comparison pretest-posttest design
to examine the effect of summer programming and an absence of summer
programming on reading regression and/or maintenance of students with
severe emotional disorders (SED). Fifty-five (55) elementary school age SED
boys and girls (8-14) attended a summer special day school program within
the Chicago Public School System. Summer school participation was voluntary
and attendance to the program was determined at each student's IEP
conference. The study sample consisted of two groups: (1) 45 students who
attended summer school; and (2) 10 students who did not attend.
```

The interventions included both the Ginn Reading Program and the Chicago Mastery Learning Reading Program (CMLRP). Each program had detailed instructions to follow throughout the prsentation and evaluation of a lesson. Daily reading instruction consisted of two periods, forty minutes each for thirty-nine days. All instruction was individualized and conducted in a small group of four to seven students.

In late spring, a pretest was administered to all groups. Reading Recognition and Reading Comprehension, two subtests of the Peabody Individual Achievement Test (PIAT) were administered to each student by the classroom teacher.

The Pearson Correlation, Analysis of Variance, and chi-square were used as data analyses. The central finding revealed no significant changes or gains occurred between the groups over the summer months. That is, neither group regressed or acquired new reading skills, but rather maintained the same skills from the preceding year. The level of days in attendance was also insignificant.

5/7/2
946317 ORDER NO: AAD87-06230
VALIDATION OF THE GORDON DIAGNOSTIC SYSTEM AND THE WISC-R IN THE DIAGNOSIS OF ATTENTION DEFICIT DISORDER (HYPERACTIVITY, HYPERKINESIS)

Author: FLANSBURG, MILDRED DALLENE WALLACE
Degree: PH.D.
Year: 1986
Corporate Source/Institution: THE UNIVERSITY OF NEBRASKA - LINCOLN (0138)
Source: VOLUME 47/11-B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 4673. 138 PAGES

The purpose of this study was to identify valid measures of impulsivity, inattention, and hyperactivity associated with the APA-DSM III diagnosis of Attention Deficit Disorder.

Specifically, the study investigated the relationship of the Gordon Diagnostic System (GDS) to the Conner's Teacher (CTRS) and Parent (CPSQ) rating scales; the ability of the GDS and WISC-R subscales to discriminate ADD (N = 30) and nonhyperactive subjects with a mixed diagnoses of behavioral and emotional disorders (N = 30); and the effects of Ritalin treatment of ADD subjects (N = 15) compared to non-treated ADD subjects (N = 15) on pre and post measures of the GDS.

Male and female elementary school children, ages 6-12, with average IQ were tested on the GDS, WISC-R, WRAT-R, CTRS, and CPSQ. All of the measures differentiated the ADD from the clinical subjects, $p < .001$.

Pearson Product Moment correlations between the GDS and Conner scales were not significant. The measures on the Vigilance Task were the only GDS indices that were significantly related to WISC-R subscales and only for the ADD group. There was a lack of consistency in the correlations on the Delay Task for both ADD and clinical groups.

Stepwise discriminant analyses of the GDS and WISC-R subscales selected Efficiency Ratio on the Delay Task; Omissions and Commissions on the Vigilance Task; and Digit Span, Comprehension, Coding, Picture Arrangement, and Arithmetic subscales to predict group membership. These measures correctly classified 86.7% of ADD and clinical subjects.

There were no significant differences between the Ritalin treated ADD subjects and the non-treated ADD subjects on post measures on the GDS. On all of the GDS variables except Rewards on the Delay Task, the Ritalin treated subjects showed higher gains on post measures than the non-treated subjects. Failure to reach significance may have been related to low dose levels (5 mg.).

The results support the identity of a distinct ADD syndrome and the validity of the GDS and WISC-R in the discrimination of ADD from other clinical diagnoses. The instruments have valid use in clinical application and future developmental research.

```
? b 66                                          [begin a new database]

      23aug90 16:01:34 User094781 Session A129.4
           $3.60    0.050 Hrs File35
              $0.38  2 Type(s) in Format  7
           $0.38  2 Types
    $3.98  Estimated cost File35
    $0.50  Dialnet
    $4.48  Estimated cost this search
   $17.99  Estimated total session cost   0.250 Hrs.

File  66:GPO MONTHLY CATALOG _ JUL 1976 TO AUG 1990

      Set  Items  Description
      ---  -----  -----------
? ss mainstreaming

      S1      65  MAINSTREAMING
? ss parent?

      S2     510  PARENT?
? s s1 and s2

              65  S1
             510  S2
      S3      12  S1 AND S2
? t3/7/1-3


 3/7/1
1593417         ED 1.310/2-261483
```

Parental involvement in the special education process /.by Bethany R. Hampton and Maria Christina Fernandez
Hampton, Bethany R.
Fernandez, Maria Christina.
Corporate Source: Special Education Programs (U.S.) University of Texas at Austin. College of Education.
[Austin, Tex. : Texas Univ., Austin, College of Education, 1985] 29 leaves ; 28 cm.
Publication Date(s): 1985
LCCN: gp 88016226
Descriptors: Handicapped children-Education-United States-Abstracts; Mainstreaming in education-United States-Abstracts; Education-United States -Parent participation-Abstracts

3/7/2
1590752 ED 1.310/2-271921
Integration, a parent handbook
Breshears-Routon, Darro.
Corporate Source: Albuquerque Special Preschool (N.M.) United States. Office of Special Education and Rehabilitative Services.
[Albuquerque, N.M. : Albuqerque Special Preschool, 1983] [15] p. : ill. ; 22 cm.
Publication Date(s): 1983
LCCN: gp 88013323
Descriptors: Parents of handicapped children-United States-Handbooks, manuals, etc; Handicapped children-Education-United States; Mainstreaming in education-United States

3/7/3
1590751 ED 1.310/2-271906
Parental involvement in the educational process of children with special needs : an annotated report : (final report) and research analysis /. submitted by Robert D. Kreger
Kreger, Robert D.
Corporate Source: Northeastern University (Boston, Mass.) Special Education Programs (U.S.)
Boston, Mass. : Northeastern University, [1982] 398, 10, [1] leaves ; 28 cm.
Publication Date(s): 1982
LCCN: gp 88013322
Descriptors: Mainstreaming in education-United States; Handicapped children-Education-United States; Education-United States- Parent participation; Resource programs (Education)
? ss handicapped

S4 2015 HANDICAPPED
? s s4 and children

```
           2015  S4
           2917  CHILDREN
      S5    611  S4 AND CHILDREN
? s s5 and law
            611  S5
          23565  LAW
      S6     85  S5 AND LAW
? t6/7/1-2


 6/7/1
1624115        GA 1.13-GGD-86-4
  Implementation of Public Law 94-142 as it relates to handicapped
delinquents in the District of Columbia : report to the Ranking Minority
Member, Committee on the District of Columbia, House of Representatives /.
by the U.S. General Accounting Office
  Corporate Source: United States. General Accounting Office.
  Washington, D.C. : The Office, [1985]  2, 51 p. :  ill. ;  28 cm.
  Publication Date(s): 1985
  LCCN: gp 90007997
  Local Call No.: KF4210.Z9I46
  Descriptors: Handicapped children-Law and legislation-United States;
Handicapped children-Education-Washington (D.C.); Juvenile delinquents-
Education-Washington (D.C.)

 6/7/2
1623921        ED 1.310/2-267580
  "To assure the free appropriate public education of all handicapped
children" : eighth annual report to Congress on the implementation of the
Education of the Handicapped Act /.prepared by the Division of Educational
Services, Special Education Programs
  Corporate Source: United States. Office of Special Education and
Rehabilitative Services.
  [Washington, DC] : U.S. Dept. of Education, U.S. Office of Special
Education and Rehabilitative Services, [1986-  v. :  ill. ;  28 cm.
  Publication Date(s): 1986-9999
  LCCN: gp 90007803
  Descriptors: Handicapped children-Education-Law and legislation-United
States
logoff
       23aug90 16:04:40 User094781 Session A129.5
            $2.38    0.066 Hrs File66
               $0.75  5 Type(s) in Format  7
            $0.75  5 Types
     $3.13  Estimated cost File66
     $0.66  Dialnet
     $3.79  Estimated cost this search
    $21.78  Estimated total session cost   0.316 Hrs.
Logoff: level 24.01.4 A  16:04:40
```

Appendix E

Handout 3

DIALOG COMMANDS

b Begin a database. Follow with a space, then the number of the database

1 ERIC
11 PsycINFO
35 Dissertation Abstracts Online
54 Exceptional Child Education Resources
66 GPO (Government Publications Office)

ss Select set. Follow with a space, then the term or terms connected by () for a phrase or connectors
AND OR NOT
Use a single s if followed by already established sets: s s4 and s5 but ss s4 and child

select language s s4/eng

select publication years s py=1988:1990

t Type (display) records. Follow with the set number/ the format number/record numbers

t4/7/1-3 type set 4 in format 7 records 1 through 3

Formats: 3 Citation Only
7 Citation and Abstract

F5 key Logout of DIALOG

Appendix F

Timeline of Activities

Date	Contact Person	Description of Activity
04/05/90	DIALOG	request information on program
04/08/90	DIALOG	information arrives on program
04/13/90	Library Director	Discussion of dissertation topic and approval
	Sandra Bennett	Faculty Senator; Query on addition of courses to curriculum
04/15/90	Dissertation Committee chair	Sent esdais of dissertation idea; cc to second member
04/16/90	Dissertation Committee member	Message on idea
04/19/90	Dissertation Committee chair	esdais message on meeting with second member
04/21/90	Patricia Kyprides (petros)	query about number of terminals used for her high school DIALOG Classmate. 5 for 13 students (copy message)
04/19/90	John in Academic Computing	Computers available in computer lab. No modems. However, large screen monitor available for class demonstration. Also Apples.
04/23/90	Dissertation Committee chair	Approval of dissertation idea
05/10/90	Library Director	Second discussion regarding dissertation topic & support letter to committee. Narrowing proposed project down to part of established class. Graduate students and their instructors only. Test Run.
05/10/90	Instructor 1	volunteers classes
05/11/90	Library Director	Copy of support letter

05/16/90	DIALOG	Inquire about billing, class size, amount of uses--separate account, so separate invoice $15 per hour per password/per student, no set # of class meetings, no set time
06/01/90	Instructor 2	Inquire about possibility of fall class in test run; volunteers class; thinks Special Education Dept. might help with funding
06/25/90	Dick Martin	President's office; count of graduate and undergraduate students
summer 1990 original possibilities		contact instructors of research classes (summer contacts for fall classes and some winter classes, depending on instructors)

Fall 1990 definite
Nursing Research seminar
0575-516-01
Special Education Research
Design 0260-561-01G
Special Education three
other graduate courses
tentative
Psychology three graduate courses
Social Work 3 graduate courses
Education 7 graduate courses
(ERIC on CD-ROM)
Marketing Research graduate
0328-423-90G
International Marketing graduate
0328-423-90G

Winter 90 definite
Nursing Research Seminar
0575-516-01
Special Education 7 graduate
courses (one of which is
0260-562-01G Research Seminar)
tentative (no instructor names
listed in winter yet)
Marketing Research graduate
0328-418-92G ?
Education 9 graduate courses
Psychology 3 graduate courses
Sociology/Social Work 3 graduate

07/02/90	WSU Foundation Grants Officer /Grants Officer	Discussion with two grants officers on possibility of grant(s) to help pick up DIALOG charges for class.
07/03/90	Library Director	Meeting to set up funding possibilities, go over class plans, tentative list of instructors to participate in test run Wants limited to 2 classes--Instructors 1 and 2 best choice--with 50 people total. Schedule another meeting once have guesstimate of amount of time to be spent online and charges to decide if library will be able to cover costs
07/03/90	Instructor 1	Discussion on plans for class
07/05/90	DIALOG Marketing	July 1990 DIALOG Chronolog mentions "New Explorers" marketing program offering freebies--posters, search aids, literature --and demonstration password for free online time for demonstration sessions for end users. Needs to be investigated. They will send free video first and have placed name on marketing list *no charge for starting CIP
07/09/90	John in Academic Computing	Investigate large screen monitor for use in demonstrating to class in my office Large screen monitor for Mac Projector possibility
07/11/90	Instructor 1	Further discussion on plans for class Have his other two fall classes included so that number of graduate students will roughly equal those of Instructor 2
07/13/90	Instructor 2	Returns from England. Need to discuss plans for class
07/13-15/90	Dissertation Committee	Discussion on first draft of proposal
07/17/90	Instructor 2	Discussion on planned class; students need to be able to locate five articles on a particular subject--dependent on student--, read articles and report on articles located. Feels students should be debriefed

07/18/90	DIALOG Marketing	Check on video they had promised to send; supposedly on the way
07/25/90	Instructor 2	Further discussion: class will learn online searching during part of two-hour tour of library
07/29/90	Dissertation committee member	Discussion of Instructor 2 needs
07/31/90	Instructor 1	Discussion of needs for class; wants more instruction than basics covered in a tour. Doesn't feel students need to know part of dissertation project
07/31/90	PALS	PALS loads ERIC files into online catalog for trial of "several months" until fee structure for member libraries is established
08/16/90	DIALOG Marketing	Check reason for delay in sending video; was told that problem with video exists and will be sent out ASAP.
08/16/90	Instructional Resources Center	Review copy of Introduction to Searching DIALOG, a training video obtained by WSU in 1988, for possible use by classes.
08/22/90		Erase all previously saved search outputs on DIALOG hard disk to make certain space is available for class results
08/22/90	DIALOG Marketing	Check with time needed for beginning of Classroom Instruction Program
08/23/90		Run sample searches in DIALOG databases (ERIC, Exceptional Child Education Resources, PsycINFO, Dissertation Abstracts Online, GPO) for class handouts
08/28/90	Instructor 2	Several conversations; wondered if still wanted to continue since ERIC online with PALS--mention other databases; find out that class will probably have only ten graduate students; given copy of sample searches

08/29/90	Library Director	Review expected financial costs; estimate as approved Appendix G; each student limited to one hour's searching
08/30/90	Sharon in Academic Computing	Reserve projector for class demos 5545
08/31/90	Dissertation Committee	Modify proposal message
09/04/90	Instructor 2	unsure yet if enough students have registered for class to be offered; should hear from Special Ed chair by September 6
09/06/90		Fall Quarter begins
09/06/90	DIALOG Marketing	Packet with Classroom Instruction password arrives
09/10/90	Instructor 2	Discussion on plans, 5 students in class all are studying learning disabilities in elementary education
09/11/90	Instructor 1	Phone call; graduate students in classes: 4 in one, 4 in second, 8 in last class=16
09/12/90	Instructor 1	Discussion on handouts, how many students per appointment (2), normal office hours
09/12/90		Grant form for Foundation grants arrives Set up password on DIALOGlink
09/17/90	Instructor 1	5 pm classes meet for DIALOG demonstration and instruction
09/17/90	Instructor 2	7-9 pm class library tour and instruction
09/90-10/90		Individual student sessions
09/25/90	Instructor 1	Discussion on class
10/04/90	Instructors 1 & 2	Discussion on Likert scale

10/05/90	WSU Foundation Grant Officer	Deadline for WSU Foundation Grants for Fall Quarter 1990 (library director ill; get approval from officer for late application)
10/08/90	Instructor 2	Debriefs class
10/10/90	Bush Faculty Development Grant Officer	Deadline for Bush Faculty Development Project grant
10/16/90	Committee	Response
10/20/90	Instructor 1	Discussion on Likert scale
10/25/90	Instructor 1	Discussion on Likert scale
10/31/90	Instructor 1	Pilot test of questionnaire with 5 students
	Grants Office	Refusal of Foundation grant
Fall 1990		contact instructors of Winter 90 research courses?
	Library Director	keep posted on progress
11/16-20/90		Fall Quarter Final Exams Tabulate and study results
11/21/90		Quarter Break begins contact Instructors 1 and 2 for their impressions

Appendix G

Copy of

Support Letter

May 11, 1990

Dr. Marlyn Kemper
Dissertation Committee Chair
Nova University
Center for Computer and
Information Sciences
3301 College Avenue
Fort Lauderdale, FL 33314

Dear Dr. Kemper:

Kathryn Sullivan, Librarian/Assistant Professor at Winona State University and doctoral candidate at Nova University, is developing her dissertation on the feasibility of using a DIALOG instruction program for teaching online searching to library users. Ms. Sullivan has discussed her topic with me and I concur that there is a need for such a program and her proposal/methodology, which will use local resources and local users, can be supported by the Winona State University library.

I will observe with interest the activities and progress of the study and look forward to the conclusions reached from this pilot project.

Sincerely,

Elizabeth Ann Lange
Director of the Library

EAL:jp

Appendix H

Estimate of DIALOG Classroom

Instruction Program Costs

For Fall Quarter

Four classes offered by the Special Education Department in Fall Quarter 1990 by two different instructors have been chosen to participate in this study: Research Design 561, Education of Exceptional Children 400G, Student Management Systems 405G and Special Education Administrative Procedures 420G. The reason behind this is the structure of the 400 level courses in Special Education. The courses have an undergraduate section and a graduate section but the classes combine both sections, with graduate students having similar but more complex assignments than the undergraduates. Research Design is expected to consist of 10 graduate students. However, Education of Exceptional Children usually has from 21 to 25 students total, of which 5 to 7 are graduate students. Student Management Systems and Special Education Administrative Procedure will have similarly small amounts of graduate students. With this mixture, it would be possible for undergraduate students to have assignments that require searches on SilverPlatter ERIC on CD-ROM only while the graduate students will need to use both the CD-ROM database and DIALOG. Only graduate students will be observed during this study.

Total Maximum Students (31) X Possible Hours Online Per Student (1) = 31

31 X Classroom Instruction Program Cost per hour ($15) = $465.00 OK EAL 8/29/90

IF Possible Maximum Hours = 2 $930.00

The assignment from both instructors will be for the students to find seven articles of interest owned by Winona State University.

Appendix I

DIALOG Training Questionnaire

Date of your DIALOG Search_____ Time Listed on Search Printout_____
Classification: Grad Special _____ Masters _____

1. Which library services have you used in the past?
   _____Printed indexes _____Government Documents
   _____Online catalog _____Microfiche/microfilm
   _____Interlibrary loan _____InfoTrac/ERIC retrieval
   (Minitex, etc.)
2. Check as many of the following statements as apply to you:
   _____I have used microcomputers before.
   _____I have used mainframe computers before.
   _____I own a microcomputer.
   _____I have used InfoTrac/ERIC retrieval before.
   _____I have used DIALOG before.
   _____I have used the online catalog before.
3. In your DIALOG search, which databases did you use?
   ___ERIC ___Exceptional Child ___PsycInfo ___Gov. Pub ___Other
4. How many citations did you print out? _____
5. How many of the citations you printed were relevant to your needs? _____
6. Did you have difficulty with any of the following:
   ____entering databases ____entering terms
   ____error messages ____connecting terms
   ____system prompts ____printing citations

Please rate yourself as you were before the date on your printout and as you are after completing the DIALOG training session. Enter the appropiate number from the scale into the blanks.

0	1	2	3	4	5
No Experience	Beginner	Capable with much assistance	Capable with some assistance	Capable with almost no assistance	Independent

	Before	After
7. How would you rate yourself on operating the physical aspects of the search (keyboard, printer, etc.)?	____	____
8. How would you rate yourself on choosing a database appropriate to your search needs?	____	____

9. How would you rate yourself on choosing keywords appropriate to your search? ____ ____

10. How would you rate yourself on entering the search command? ____ ____

11. How would you rate yourself on using connectors? (AND, OR, NOT, ()) ____ ____

12. How would you rate yourself on using the print command? ____ ____

13. How would you rate yourself on using the truncation symbol? (?) ____ ____

Page 2
DIALOG TRAINING QUESTIONNAIRE

Please rate yourself as you were before the date on your printout and as you are after completing the DIALOG training session. Enter the appropiate number from the scale into the blanks.

0	1	2	3	4	5
No Experience	Beginner	Capable with much assistance	Capable with some assistance	Capable with almost no assistance	Independent

	Before	After
14. How would you rate yourself on limiting a search by publication year?	____	____
15. How would you rate yourself on limiting a search by language?	____	____
16. How would you rate yourself on logging out of DIALOG?	____	____
17. Overall, how would you rate your skill at using the DIALOG databases?	____	____

18. Write any comments that describe your abilities before participating in the DIALOG training and your current level of abilities.

Appendix J

DIALOG Training Questionnaire Responses

CLASSIFICATION:
INSTRUCTOR ONE - GRAD SPECIAL 7 MASTERS 3 3 NA
INSTRUCTOR TWO - GRAD SPECIAL 1 MASTERS 4
FIVE REPEAT SEARCHES

1. LIBRARY EXPERIENCE

	INSTRUCTOR ONE	INSTRUCTOR TWO
PRINTED INDEXES	9	4
ONLINE CATALOG	6	1
INTERLIBRARY LOAN	6	1
GOV.DOC.	5	1
MFICHE/MFILM	9	3
INFOTRAC/ERIC	3	3

2. COMPUTER EXPERIENCE

	USED MICRO	USED MAIN	OWN MICRO	USED INFO/ERIC	USED DIALOG	USED CATALOG
INSTRUCTOR ONE						
SUBJECT ONE	*	*				*
SUBJECT TWO	*	*	*			
SUBJECT THREE	*					
SUBJECT FOUR	*	*	*			*
SUBJECT FIVE	*	*				
SUBJECT SIX	*					*
SUBJECT SEVEN	*					*
SUBJECT EIGHT	*			*		
SUBJECT NINE	*		*			
SUBJECT TEN	*					

```
SUBJECT ELEVEN
                              *
SUBJECT TWELVE
NONE
SUBJECT THIRTEEN
NONE

INSTRUCTOR TWO
SUBJECT ONE
   *                *                                  *
SUBJECT TWO
   *                              *
SUBJECT THREE
  NONE
SUBJECT FOUR
   *                *             *
SUBJECT FIVE
   *
```

3. DATABASES USED

```
INSTRUCTOR ONE
SUBJECT ONE
ERIC    EXCEPT                   GOV.PUB.   OTHER
SUBJECT TWO
ERIC    EXCEPT    PSYCINFO       GOV.PUB.   OTHER
SUBJECT THREE
ERIC    EXCEPT    PSYCINFO       GOV.PUB.   OTHER
SUBJECT FOUR
ERIC    EXCEPT
SUBJECT FIVE
        EXCEPT    PSYCINFO       GOV.PUB.   OTHER
SUBJECT SIX
ERIC    EXCEPT    PSYCINFO       GOV.PUB.   OTHER
SUBJECT SEVEN
ERIC    EXCEPT    PSYCINFO                  OTHER
SUBJECT EIGHT
ERIC
SUBJECT NINE
ERIC              PSYCINFO
SUBJECT TEN
ERIC    EXCEPT    PSYCINFO       GOV.PUB.
SUBJECT ELEVEN
ERIC    EXCEPT    PSYCINFO       GOV.PUB.   OTHER
SUBJECT TWELVE
ERIC    EXCEPT
SUBJECT THIRTEEN
ERIC
```

INSTRUCTOR TWO
SUBJECT ONE
ERIC
SUBJECT TWO
ERIC EXCEPT
SUBJECT THREE
ERIC EXCEPT
SUBJECT FOUR
ERIC EXCEPT
SUBJECT FIVE
ERIC

Question #

7	8	9	10	11	12	13	14	15	16	17
INSTRUCTOR ONE										
SUBJECT ONE										
BEFORE TRAINING										
3	1	0	1	3	1	0	1	1	0	0
AFTER TRAINING										
4	2	2	2	4	4	3	3	3	3	3
PERFORMANCE INDICATOR RANKING										
5	2	3	4	3	3	4	4	NA	5	4
SUBJECT TWO (SUBJECTS TWO & THREE WORKED TOGETHER)										
BEFORE TRAINING										
3	4	5	5	4	4	NA	3	4	4	2
AFTER TRAINING										
4	5	5	5	5	5	NA	5	4	5	5
PERFORMANCE INDICATOR RATING										
4	5	4	5	4	5	NA	4	4	4	4
SUBJECT THREE (SUBJECTS TWO & THREE WORKED TOGETHER)										
BEFORE TRAINING										
0	1	1	0	1	0	0	0	0	0	0
AFTER TRAINING										
3	4	4	4	4	4	3	3	3	4	4
PERFORMANCE INDICATOR RANKING										
4	5	5	5	4	5	5	NA	NA	5	4
SUBJECT FOUR										
BEFORE TRAINING										
4	4	4	4	5	5	4	4	4	5	4
AFTER TRAINING										
5	5	5	5	5	5	4	5	4	5	4
PERFORMANCE INDICATOR RANKING										
5	4	2	2	3	2	NA	NA	NA	4	3

SUBJECT FIVE
BEFORE TRAINING
3 0 0 0 1 3 0 0 0 0 0
AFTER TRAINING
4 3 4 1 3 5 3 4 2 4 4
PERFORMANCE INDICATOR RANKING
4 4 4 4 4 4 NA NA 5 3 4
SUBJECT SIX
BEFORE TRAINING
3 0 0 0 0 0 0 0 0 0 0
AFTER TRAINING
5 4 5 4 3 5 5 4 5 5 4
PERFORMANCE INDICATOR RANKING
3 4 4 3 3 4 4 NA NA 4 4
SUBJECT SEVEN
BEFORE TRAINING
3 0 0 0 0 1 0 0 0 0 0
AFTER TRAINING
5 4 4 4 4 5 4 4 4 3 4
PERFORMANCE INDICATOR RANKING
4 4 4 5 4 4 5 NA NA 4 4
SUBJECT EIGHT
BEFORE TRAINING
1 0 0 0 0 0 0 1 1 0 0
AFTER TRAINING
4 3 3 3 4 4 3 3 3 4 3
PERFORMANCE INDICATOR RANKING
4 4 4 4 4 4 NA NA NA 4 4
SUBJECT NINE
BEFORE TRAINING
3 2 4 0 0 0 0 0 0 0 0
AFTER TRAINING
3 3 4 3 4 4 3 5 4 4 3
PERFORMANCE INDICATOR RANKING
4 4 4 4 4 4 NA 4 5 4 4
SUBJECT TEN
BEFORE TRAINING
1 2 3 1 0 0 0 0 0 0 0
AFTER TRAINING
4 5 5 4 4 3 3 5 4 2 5
PERFORMANCE INDICATOR RANKING
4 5 5 4 4 5 4 4 NA 5 4
SUBJECT ELEVEN
BEFORE TRAINING
0 2 3 0 0 0 0 1 1 0 0

AFTER TRAINING
3 3 4 3 1 1 3 4 4 1 3
PERFORMANCE INDICATOR RANKING
3 2 2 2 2 2 2 2 2 2 2
SUBJECT TWELVE
BEFORE TRAINING
0 0 0 0 0 0 0 0 0 0 0
AFTER TRAINING
3 4 3 3 3 5 3 0 3 4 3
PERFORMANCE INDICATOR RANKING
3 4 4 3 4 4 5 NA NA 3 4
SUBJECT THIRTEEN
BEFORE TRAINING
3 3 4 3 2 2 2 1 2 0 0
AFTER TRAINING
4 3 4 4 3 3 3 2 2 1 1
PERFORMANCE INDICATOR RANKING
4 5 5 5 4 5 4 5 NA 3 4

Question #

7 8 9 10 11 12 13 14 15 16 17

INSTRUCTOR TWO
SUBJECT ONE
BEFORE TRAINING
3 2 4 3 3 3 3 3 3 3 3
AFTER TRAINING
4 4 5 4 5 5 5 5 5 5 5
PERFORMANCE INDICATOR RANKING
5 3 4 3 3 2 NA 3 NA 1 3
SUBJECT TWO (SUBJECTS TWO & THREE WORKED TOGETHER)
BEFORE TRAINING
0 3 2 0 0 0 0 0 0 0 0
AFTER TRAINING
2 5 5 2 3 3 2 5 5 5 3
PERFORMANCE INDICATOR RATING
3 5 5 4 5 5 NA NA NA 3 4
SUBJECT THREE (ON SEARCH DONE WITHOUT SUBJECT TWO)
BEFORE TRAINING
0 0 0 0 0 0 0 0 0 0 0
AFTER TRAINING
3 2 4 3 4 3 3 4 3 3 3
PERFORMANCE INDICATOR RANKING
3 4 4 3 3 3 3 NA NA 3 3

SUBJECT FOUR
BEFORE TRAINING

1	1	2	0	0	0	0	0	1	0	0

AFTER TRAINING

2	2	3	1	2	1	3	3	3	1	3

PERFORMANCE INDICATOR RANKING

5	4	4	3	3	3	1	4	NA	4	4

SUBJECT FIVE
BEFORE TRAINING

3	3	4	5	3	3	2	1	1	0	3

AFTER TRAINING

3	3	4	5	4	3	3	1	1	0	3

PERFORMANCE INDICATOR RANKING

4	3	4	4	4	4	NA	NA	NA	4	4

18. COMMENTS
INSTRUCTOR ONE
SUBJECT ONE
training session was helpful - paper given to use as an example was very important in seeing the correct procedure
SUBJECT TWO
NONE
SUBJECT THREE
I thought using Dialog was a wonderful experience! I thank you very much.
SUBJECT FOUR
NONE
SUBJECT FIVE
I had computer training on my past job that was very helpful in adapting to the dialog session.
SUBJECT SIX
I've worked with word processers before so I was familiar with the keyboard-but have never used a computer for detailed research. After the initial training and with Kathy Sullivan sitting down with me, I felt capable overall of using the system with little or no assistance.
SUBJECT SEVEN
NONE
SUBJECT EIGHT
I plan on using dialog throughout my graduate course work for all research.
SUBJECT NINE
NONE
SUBJECT TEN
NONE
SUBJECT ELEVEN
NONE

SUBJECT TWELVE
I've had no previous experience on computers and feel like I've learned some basic techniques.
SUBJECT THIRTEEN
Using the DIALOG gave me a much better range of what is available and the ability to review at a later date instead of in a rush at the library as in the past. The assistance by the librarian was great and very helpful.

INSTRUCTOR TWO
SUBJECT ONE
NONE
SUBJECT TWO
I liked the reference sheet to refer to for # of database: what/how to tell the computer the next command. The time (actually time) putting information into the computer was too short. I feel somewhat comfortable now but not enough to sit and do a search independently--two or three more sessions & I'm sure I would feel more comfortable.
SUBJECT THREE
Before particpating in the training I probably would not have pursued this resource. Now I would not hesitate to use it...it would be a very valuable resource!
SUBJECT FOUR
I have a good general idea of the system but would need some assistance to put it all together (or take a lot of time for trial & error).
SUBJECT FIVE
My experience was very limited. Using the "key" that was given to me & the prior introductory session I was able to quickly conduct my search.

Appendix K

Datafile of Responses

Subject #	Class	Occasion (Pre/Post/Dur.)	Response to #7	8	9	10	11	12	13	14	15	16	17
1	1	1	3	1	0	1	3	1	0	1	1	0	0
1	1	2	4	2	2	2	4	4	3	3	3	3	3
1	1	3	5	2	3	4	3	3	4	4	9	5	4
2	1	1	3	4	5	5	4	4	9	3	4	4	2
2	1	2	4	5	5	5	5	5	9	5	4	5	5
2	1	3	4	5	4	5	4	5	9	4	4	4	4
3	1	1	0	1	1	0	1	0	0	0	0	0	0
3	1	2	3	4	4	4	4	4	3	3	3	4	4
3	1	3	4	5	5	5	4	5	5	9	9	5	4
4	1	1	4	4	4	4	5	5	4	4	4	5	4
4	1	2	5	5	5	5	5	5	4	5	4	5	4
4	1	3	5	4	2	2	3	2	9	9	9	4	3
5	1	1	3	0	0	0	1	3	0	0	0	0	0
5	1	2	4	3	4	1	3	5	3	4	2	4	4
5	1	3	4	4	4	4	4	4	9	9	5	3	4
6	1	1	3	0	0	0	0	0	0	0	0	0	0
6	1	2	5	4	5	4	3	5	5	4	5	5	4
6	1	3	3	4	4	3	3	4	4	9	9	4	4
7	1	1	3	0	0	0	0	1	0	0	0	0	0
7	1	2	5	4	4	4	4	5	4	4	4	3	4
7	1	3	4	4	4	5	4	4	5	9	9	4	4
8	1	1	1	0	0	0	0	0	0	1	1	0	0
8	1	2	4	3	3	3	4	4	3	3	3	4	3
8	1	3	4	4	4	4	4	4	9	9	9	4	4
9	1	1	3	2	4	0	0	0	0	0	0	0	0
9	1	2	3	3	4	3	4	4	3	5	4	4	3
9	1	3	4	4	4	4	4	4	9	4	5	4	4
10	1	1	1	2	3	1	0	0	0	0	0	0	0
10	1	2	4	5	5	4	4	3	3	5	4	2	5
10	1	3	4	5	5	4	4	5	4	4	9	5	4
11	1	1	0	2	3	0	0	0	0	1	1	0	0
11	1	2	3	3	4	3	1	1	3	4	4	1	3
11	1	3	3	2	2	2	2	2	2	2	2	2	2
12	1	1	0	0	0	0	0	0	0	0	0	0	0
12	1	2	3	4	3	3	3	5	3	0	3	4	3
12	1	3	3	4	4	3	4	4	5	9	9	3	4
13	1	1	3	3	4	3	2	2	2	1	2	0	0
13	1	2	4	3	4	4	3	3	3	2	2	1	1

13	1	3	4	5	5	5	4	5	4	5	9	3	4
14	2	1	3	2	4	3	3	3	3	3	3	3	3
14	2	2	4	4	5	4	5	5	5	5	5	5	5
14	2	3	5	3	4	3	3	2	9	3	9	1	3
15	2	1	0	3	2	0	0	0	0	0	0	0	0
15	2	2	2	5	5	2	3	3	2	5	5	5	3
15	2	3	3	5	5	4	5	5	9	9	9	3	4
16	2	1	0	0	0	0	0	0	0	0	0	0	0
16	2	2	3	2	4	3	4	3	3	4	3	3	3
16	2	3	3	4	4	3	3	3	3	9	9	3	3
17	2	1	1	1	2	0	0	0	0	0	1	0	0
17	2	2	2	2	3	1	2	1	3	3	3	1	3
17	2	3	5	4	4	3	3	3	1	4	9	4	4
18	2	1	3	3	4	5	3	3	2	1	1	0	3
18	2	2	3	3	4	5	4	3	3	1	1	0	3
18	2	3	4	3	4	4	4	4	9	9	9	4	4

Appendix L

Histograms of Student Questionnaire Responses

```
**********
before.dat
**********
 1 1 1 3 1 0 1 3 1 0 1 1 0 0
 2 1 1 3 4 5 5 4 4 9 3 4 4 2
 3 1 1 0 1 1 0 1 0 0 0 0 0 0
 4 1 1 4 4 4 4 5 5 4 4 4 5 4
 5 1 1 3 0 0 0 1 3 0 0 0 0 0
 6 1 1 3 0 0 0 0 0 0 0 0 0 0
 7 1 1 3 0 0 0 0 1 0 0 0 0 0
 8 1 1 1 0 0 0 0 0 0 1 1 0 0
 9 1 1 3 2 4 0 0 0 0 0 0 0 0
10 1 1 1 2 3 1 0 0 0 0 0 0 0
11 1 1 0 2 3 0 0 0 0 1 1 0 0
12 1 1 0 0 0 0 0 0 0 0 0 0 0
13 1 1 3 3 4 3 2 2 2 1 2 0 0
14 2 1 3 2 4 3 3 3 3 3 3 3 3
15 2 1 0 3 2 0 0 0 0 0 0 0 0
16 2 1 0 0 0 0 0 0 0 0 0 0 0
17 2 1 1 1 2 0 0 0 0 0 1 0 0
18 2 1 3 3 4 5 3 3 2 1 1 0 3

**********
before.r02
**********

SET WIDTH = 80

TITLE = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING

DATA LIST FILE = 'before.dat' FIXED
     / Subject#  01-02
       Class     04
       Occasion  06
       Q07       08
       Q08       10
       Q09       12
       Q10       14
       Q11       16
       Q12       18
       Q13       20
       Q14       22
       Q15       24
       Q16       26
       Q17       28
```

```
VARIABLE LABELS
      Subject#  "Subject #"/
      Class     "Class"/
      Occasion  "Pretest"/
      Q07       "Terminal"/
      Q08       "Database Choice"/
      Q09       "Subject Terms"/
      Q10       "Search Command"/
      Q11       "Connectors"/
      Q12       "Print Command"/
      Q13       "Truncation"/
      Q14       "Publ Year"/
      Q15       "Language"/
      Q16       "Logging Out"/
      Q17       "Overall".

VALUE LABELS
      Class     1  'Full Period'
                2  'Tour'.

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q14 (9) Q15 (9) Q16 (9) Q17 (9)

FREQUENCIES VARIABLES=Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
      / HISTOGRAM = NORMAL
      / STATISTICS = ALL

**********
before.o02
**********
118 Apr 91   SPSS-X Release 3.0 for VAX/UNIX                    Page   1
 04:03:45    Nova University                VAX 8550         ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 This software is functional through November 30, 1991.

 Try the new SPSS-X Release 3.0 features:

 * Interactive SPSS-X command execution          * Improvements in:
 * Online Help                                   *   REPORT
 * Nonlinear Regression                          *   TABLES
 * Time Series and Forecasting (TRENDS)          *   Simplified Syntax
 * Macro Facility                                *   Matrix I/O
See SPSS-X Users Guide, Third Edition for more information on these features.

    1  0
    2  0  SET WIDTH = 80
    3
```

```
  4  TITLE = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING
  5
  6  DATA LIST FILE = 'before.dat' FIXED
  7       / Subject#  01-02
  8         Class     04
  9         Occasion  06
 10         Q07       08
 11         Q08       10
 12         Q09       12
 13         Q10       14
 14         Q11       16
 15         Q12       18
 16         Q13       20
 17         Q14       22
 18         Q15       24
 19         Q16       26
 20         Q17       28
 21

THE COMMAND ABOVE READS   1 RECORDS FROM before.dat

          VARIABLE   REC  START    END         FORMAT  WIDTH  DEC

          SUBJECT#     1      1      2         F           2    0
          CLASS        1      4      4         F           1    0
          OCCASION     1      6      6         F           1    0
          Q07          1      8      8         F           1    0
          Q08          1     10     10         F           1    0
          Q09          1     12     12         F           1    0
          Q10          1     14     14         F           1    0
          Q11          1     16     16         F           1    0
          Q12          1     18     18         F           1    0
          Q13          1     20     20         F           1    0
          Q14          1     22     22         F           1    0
          Q15          1     24     24         F           1    0
          Q16          1     26     26         F           1    0
          Q17          1     28     28         F           1    0
118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page   2
 04:03:46  Nova University                VAX 8550         ULTRIX 2.3


END OF DATALIST TABLE


 22  VARIABLE LABELS
 23         Subject#  "Subject #"/
 24         Class     "Class"/
 25         Occasion  "Pretest"/
 26         Q07       "Terminal"/
 27         Q08       "Database Choice"/
 28         Q09       "Subject Terms"/
```

```
        Q10       "Search Command"/
        Q11       "Connectors"/
        Q12       "Print Command"/
        Q13       "Truncation"/
        Q14       "Publ Year"/
        Q15       "Language"/
        Q16       "Logging Out"/
        Q17       "Overall".

VALUE LABELS
        Class     1  'Full Period'
                  2  'Tour'.

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q14 (9) Q15 (9) Q16 (9) Q17 (9)

FREQUENCIES VARIABLES=Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
        / HISTOGRAM = NORMAL
        / STATISTICS = ALL
```

There are 197168 bytes of memory available.
The largest contiguous area has 197168 bytes.

***** MEMORY ALLOWS A TOTAL OF 7040 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
THERE ALSO MAY BE UP TO 880 VALUE LABELS FOR EACH VARIABLE.

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 3
04:03:47 Nova University VAX 8550 ULTRIX 2.3

Q07 Terminal

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	5	26.3	27.8	27.8
	1	3	15.8	16.7	44.4
	3	9	47.4	50.0	94.4
	4	1	5.3	5.6	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       5         .00  **********:**********
       3        1.00  **********          .
       0        2.00                      .
       9        3.00  ********************:**************************
       1        4.00  *****    .
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	1.889	STD ERR	.342	MEDIAN	3.000
MODE	3.000	STD DEV	1.451	VARIANCE	2.105
KURTOSIS	-1.737	S E KURT	1.038	SKEWNESS	-.305
S E SKEW	.536	RANGE	4.000	MINIMUM	.000
MAXIMUM	4.000	SUM	34.000		

VALID CASES 18 MISSING CASES 1

Q08 Database Choice

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	6	31.6	33.3	33.3
	1	3	15.8	16.7	50.0
	2	4	21.1	22.2	72.2
	3	3	15.8	16.7	88.9
	4	2	10.5	11.1	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       6         .00  **************:******************
       3        1.00  **********          .
       4        2.00  ********************    .
       3        3.00  **********:
       2        4.00  *****:****
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	1.556	STD ERR	.336	MEDIAN	1.500
MODE	.000	STD DEV	1.423	VARIANCE	2.026
KURTOSIS	-1.161	S E KURT	1.038	SKEWNESS	.356
S E SKEW	.536	RANGE	4.000	MINIMUM	.000
MAXIMUM	4.000	SUM	28.000		

VALID CASES 18 MISSING CASES 1

Q09 Subject Terms

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	7	36.8	38.9	38.9
	1	1	5.3	5.6	44.4
	2	2	10.5	11.1	55.6
	3	2	10.5	11.1	66.7
	4	5	26.3	27.8	94.4
	5	1	5.3	5.6	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .20 OCCURRENCES
7	.00	**********:**********
1	1.00	***** .
2	2.00	********** .
2	3.00	********** .
5	4.00	**********:**********
1	5.00	****:

I.....I.....I.....I.....I.....I
0 2 4 6 8 10
HISTOGRAM FREQUENCY

MEAN	2.000	STD ERR	.443	MEDIAN	2.000
MODE	.000	STD DEV	1.879	VARIANCE	3.529
KURTOSIS	-1.755	S E KURT	1.038	SKEWNESS	.120
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	36.000		

VALID CASES 18 MISSING CASES 1

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 6
04:03:47 Nova University VAX 8550 ULTRIX 2.3

Q10 Search Command

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	11	57.9	61.1	61.1
	1	2	10.5	11.1	72.2
	3	2	10.5	11.1	83.3
	4	1	5.3	5.6	88.9
	5	2	10.5	11.1	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .40 OCCURRENCES
11	.00	*******:*********************
2	1.00	***** .
0	2.00	.
2	3.00	*****.
1	4.00	**:
2	5.00	:****

I.....I.....I.....I.....I.....I
0 4 8 12 16 20
HISTOGRAM FREQUENCY

MEAN	1.222	STD ERR	.440	MEDIAN	.000
MODE	.000	STD DEV	1.865	VARIANCE	3.477
KURTOSIS	-.067	S E KURT	1.038	SKEWNESS	1.229
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	22.000		

VALID CASES 18 MISSING CASES 1

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 7
04:03:47 Nova University VAX 8550 ULTRIX 2.3

Q11 Connectors

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	10	52.6	55.6	55.6
	1	2	10.5	11.1	66.7
	2	1	5.3	5.6	72.2
	3	3	15.8	16.7	88.9
	4	1	5.3	5.6	94.4
	5	1	5.3	5.6	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

      10         .00  ****************:**********************************
       2        1.00  **********           .
       1        2.00  *****                .
       3        3.00  ***********:***
       1        4.00  ****:
       1        5.00  *:***
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	1.222	STD ERR	.392	MEDIAN	.000
MODE	.000	STD DEV	1.665	VARIANCE	2.771
KURTOSIS	-.165	S E KURT	1.038	SKEWNESS	1.067
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	22.000		

VALID CASES 18 MISSING CASES 1

Q12 Print Command

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	10	52.6	55.6	55.6
	1	2	10.5	11.1	66.7
	2	1	5.3	5.6	72.2
	3	3	15.8	16.7	88.9

4	1	5.3	5.6	94.4
5	1	5.3	5.6	100.0
.	1	5.3	MISSING	
TOTAL	19	100.0	100.0	

```
 COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

    10         .00  ****************:**********************************
     2        1.00  **********           .
     1        2.00  *****                .
     3        3.00  ***********:***
     1        4.00  ****:
     1        5.00  *:***
                   I.........I.........I.........I.........I.........I
                   0         2         4         6         8        10
                             HISTOGRAM FREQUENCY
```

MEAN	1.222	STD ERR	.392	MEDIAN	.000
MODE	.000	STD DEV	1.665	VARIANCE	2.771
KURTOSIS	-.165	S E KURT	1.038	SKEWNESS	1.067
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	22.000		

VALID CASES 18 MISSING CASES 1

Q13 Truncation

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	13	68.4	76.5	76.5
	2	2	10.5	11.8	88.2
	3	1	5.3	5.9	94.1
	4	1	5.3	5.9	100.0
	.	1	5.3	MISSING	
	9	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
 COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .40 OCCURRENCES
```

```
      13        .00  ***********:**********************
       0       1.00               .
       2       2.00  *****  .
       1       3.00  *:*
       1       4.00  ***
                     I.........I.........I.........I.........I.........I
                     0         4         8        12        16        20
                               HISTOGRAM FREQUENCY
```

MEAN	.647	STD ERR	.308	MEDIAN	.000
MODE	.000	STD DEV	1.272	VARIANCE	1.618
KURTOSIS	2.121	S E KURT	1.063	SKEWNESS	1.795
S E SKEW	.550	RANGE	4.000	MINIMUM	.000
MAXIMUM	4.000	SUM	11.000		

VALID CASES 17 MISSING CASES 2

Q14 Publ Year

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	10	52.6	55.6	55.6
	1	5	26.3	27.8	83.3
	3	2	10.5	11.1	94.4
	4	1	5.3	5.6	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

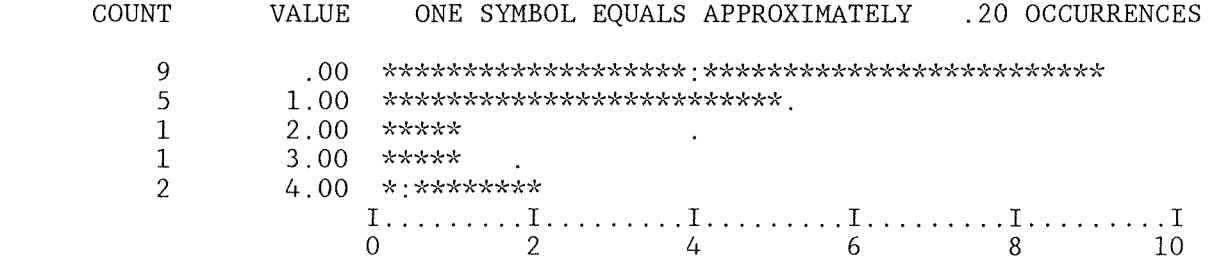
```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

      10         .00  **********************:****************************
       5        1.00  *************************    .
       0        2.00                .
       2        3.00  *****:****
       1        4.00  :****
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	.833	STD ERR	.294	MEDIAN	.000
MODE	.000	STD DEV	1.249	VARIANCE	1.559
KURTOSIS	1.543	S E KURT	1.038	SKEWNESS	1.575
S E SKEW	.536	RANGE	4.000	MINIMUM	.000
MAXIMUM	4.000	SUM	15.000		

VALID CASES 18 MISSING CASES 1

Q15 Language

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	9	47.4	50.0	50.0
	1	5	26.3	27.8	77.8
	2	1	5.3	5.6	83.3
	3	1	5.3	5.6	88.9
	4	2	10.5	11.1	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	



MEAN	1.000	STD ERR	.323	MEDIAN	.500
MODE	.000	STD DEV	1.372	VARIANCE	1.882
KURTOSIS	.835	S E KURT	1.038	SKEWNESS	1.384
S E SKEW	.536	RANGE	4.000	MINIMUM	.000
MAXIMUM	4.000	SUM	18.000		

VALID CASES 18 MISSING CASES 1

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 12
04:03:47 Nova University VAX 8550 ULTRIX 2.3

Q16 Logging Out

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	15	78.9	83.3	83.3
	3	1	5.3	5.6	88.9
	4	1	5.3	5.6	94.4
	5	1	5.3	5.6	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .40 OCCURRENCES
15	.00	**********:**************************
0	1.00	.
0	2.00	.
1	3.00	***.
1	4.00	:**
1	5.00	***

I.....I.....I.....I.....I.....I.....I
0 4 8 12 16 20
HISTOGRAM FREQUENCY

MEAN	.667	STD ERR	.370	MEDIAN	.000
MODE	.000	STD DEV	1.572	VARIANCE	2.471
KURTOSIS	3.373	S E KURT	1.038	SKEWNESS	2.159
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	12.000		

VALID CASES 18 MISSING CASES 1

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 13
04:03:47 Nova University VAX 8550 ULTRIX 2.3

Q17 Overall

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	14	73.7	77.8	77.8
	2	1	5.3	5.6	83.3
	3	2	10.5	11.1	94.4
	4	1	5.3	5.6	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .40 OCCURRENCES

      14         .00  ***********:************************
       0        1.00               .
       1        2.00  ***     .
       2        3.00  **:**
       1        4.00  :**
                     I.........I.........I.........I.........I.........I
                     0         4         8        12        16        20
                               HISTOGRAM FREQUENCY
```

MEAN	.667	STD ERR	.313	MEDIAN	.000
MODE	.000	STD DEV	1.328	VARIANCE	1.765
KURTOSIS	1.466	S E KURT	1.038	SKEWNESS	1.713
S E SKEW	.536	RANGE	4.000	MINIMUM	.000
MAXIMUM	4.000	SUM	12.000		

VALID CASES 18 MISSING CASES 1

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 14
04:03:47 Nova University VAX 8550 ULTRIX 2.3

PRECEDING TASK REQUIRED 0.76 SECONDS CPU TIME; 0.99 SECONDS ELAPSED.

```
53

  53 COMMAND LINES READ.
   0 ERRORS DETECTED.
   0 WARNINGS ISSUED.
   1 SECONDS CPU TIME.
   2 SECONDS ELAPSED TIME.
     END OF JOB.
```

```
*********
after.dat
*********
 1 1 2 4 2 2 2 4 4 3 3 3 3 3
 2 1 2 4 5 5 5 5 5 9 5 4 5 5
 3 1 2 3 4 4 4 4 4 3 3 3 4 4
 4 1 2 5 5 5 5 5 5 4 5 4 5 4
 5 1 2 4 3 4 1 3 5 3 4 2 4 4
 6 1 2 5 4 5 4 3 5 5 4 5 5 4
 7 1 2 5 4 4 4 4 5 4 4 4 3 4
 8 1 2 4 3 3 3 4 4 3 3 3 4 3
 9 1 2 3 3 4 3 4 4 3 5 4 4 3
10 1 2 4 5 5 4 4 3 3 5 4 2 5
11 1 2 3 3 4 3 1 1 3 4 4 1 3
12 1 2 3 4 3 3 3 5 3 0 3 4 3
13 1 2 4 3 4 4 3 3 3 2 2 1 1
14 2 2 4 4 5 4 5 5 5 5 5 5 5
15 2 2 2 5 5 2 3 3 2 5 5 5 3
16 2 2 3 2 4 3 4 3 3 4 3 3 3
17 2 2 2 2 3 1 2 1 3 3 3 1 3
18 2 2 3 3 4 5 4 3 3 1 1 0 3

*********
after.r02
*********

SET WIDTH = 80

TITLE = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING

DATA LIST FILE = 'after.dat' FIXED
     / Subject#  01-02
       Class     04
       Occasion  06
       Q07       08
       Q08       10
       Q09       12
       Q10       14
       Q11       16
       Q12       18
       Q13       20
       Q14       22
       Q15       24
       Q16       26
       Q17       28
```

```
VARIABLE LABELS
       Subject#  "Subject #"/
       Class     "Class"/
       Occasion  "Posttest"/
       Q07       "Terminal"/
       Q08       "Database Choice"/
       Q09       "Subject Terms"/
       Q10       "Search Command"/
       Q11       "Connectors"/
       Q12       "Print Command"/
       Q13       "Truncation"/
       Q14       "Publ Year"/
       Q15       "Language"/
       Q16       "Logging Out"/
       Q17       "Overall".

VALUE LABELS
       Class     1  'Full Period'
                 2  'Tour'.

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q14 (9) Q15 (9) Q16 (9) Q17 (9)

FREQUENCIES VARIABLES=Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
       / HISTOGRAM = NORMAL
       / STATISTICS = ALL


*********
after.o02
*********
118 Apr 91   SPSS-X Release 3.0 for VAX/UNIX                  Page   1
 04:03:18    Nova University              VAX 8550        ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 This software is functional through November 30, 1991.

 Try the new SPSS-X Release 3.0 features:

 * Interactive SPSS-X command execution          * Improvements in:
 * Online Help                                   *   REPORT
 * Nonlinear Regression                          *   TABLES
 * Time Series and Forecasting (TRENDS)          *   Simplified Syntax
 * Macro Facility                                *   Matrix I/O
See SPSS-X Users Guide, Third Edition for more information on these features.
```

```
  1  0
  2  0  SET WIDTH = 80
  3
  4  TITLE = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING
  5
  6  DATA LIST FILE = 'after.dat' FIXED
  7       / Subject#  01-02
  8         Class     04
  9         Occasion  06
 10         Q07       08
 11         Q08       10
 12         Q09       12
 13         Q10       14
 14         Q11       16
 15         Q12       18
 16         Q13       20
 17         Q14       22
 18         Q15       24
 19         Q16       26
 20         Q17       28
 21

THE COMMAND ABOVE READS   1 RECORDS FROM after.dat

          VARIABLE   REC  START    END         FORMAT  WIDTH  DEC

          SUBJECT#     1      1      2          F           2    0
          CLASS        1      4      4          F           1    0
          OCCASION     1      6      6          F           1    0
          Q07          1      8      8          F           1    0
          Q08          1     10     10          F           1    0
          Q09          1     12     12          F           1    0
          Q10          1     14     14          F           1    0
          Q11          1     16     16          F           1    0
          Q12          1     18     18          F           1    0
          Q13          1     20     20          F           1    0
          Q14          1     22     22          F           1    0
          Q15          1     24     24          F           1    0
          Q16          1     26     26          F           1    0
          Q17          1     28     28          F           1    0
118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING  Page   2
 04:03:19  Nova University                VAX 8550        ULTRIX 2.3


END OF DATALIST TABLE
```

```
 22  VARIABLE LABELS
 23         Subject#   "Subject #"/
 24         Class      "Class"/
 25         Occasion   "Posttest"/
 26         Q07        "Terminal"/
 27         Q08        "Database Choice"/
 28         Q09        "Subject Terms"/
 29         Q10        "Search Command"/
 30         Q11        "Connectors"/
 31         Q12        "Print Command"/
 32         Q13        "Truncation"/
 33         Q14        "Publ Year"/
 34         Q15        "Language"/
 35         Q16        "Logging Out"/
 36         Q17        "Overall".
 37
 38  VALUE LABELS
 39         Class      1  'Full Period'
 40                    2  'Tour'.
 41
 42  MISSING VALUE
 43   Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 44   Q14 (9) Q15 (9) Q16 (9) Q17 (9)
 45
 46  FREQUENCIES VARIABLES=Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
 47         / HISTOGRAM = NORMAL
 48         / STATISTICS = ALL
 49
 50
 51
 52


 There are 197168 bytes of memory available.
 The largest contiguous area has 197168 bytes.

***** MEMORY ALLOWS A TOTAL OF 7040 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
       THERE ALSO MAY BE UP TO  880 VALUE LABELS FOR EACH VARIABLE.

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING  Page    3
 04:03:19  Nova University                VAX 8550         ULTRIX 2.3


 Q07       Terminal
```

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	2	10.0	11.1	11.1
	3	6	30.0	33.3	44.4
	4	7	35.0	38.9	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       2        2.00  ********:*
       6        3.00  ******************************.
       7        4.00  ***********************************:
       3        5.00  ************:**
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	3.611	STD ERR	.216	MEDIAN	4.000
MODE	4.000	STD DEV	.916	VARIANCE	.840
KURTOSIS	-.566	S E KURT	1.038	SKEWNESS	-.110
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	65.000		

VALID CASES 18 MISSING CASES 2

Q08 Database Choice

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	3	15.0	16.7	16.7
	3	6	30.0	33.3	50.0
	4	5	25.0	27.8	77.8
	5	4	20.0	22.2	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       3        2.00  **********:****
       6        3.00  ****************************:
       5        4.00  ************************     .
       4        5.00  ************:*******
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

MEAN	3.556	STD ERR	.246	MEDIAN	3.500
MODE	3.000	STD DEV	1.042	VARIANCE	1.085
KURTOSIS	-1.067	S E KURT	1.038	SKEWNESS	.010
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	64.000		

VALID CASES 18 MISSING CASES 2

Q09 Subject Terms

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	1	5.0	5.6	5.6
	3	3	15.0	16.7	22.2
	4	8	40.0	44.4	66.7
	5	6	30.0	33.3	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

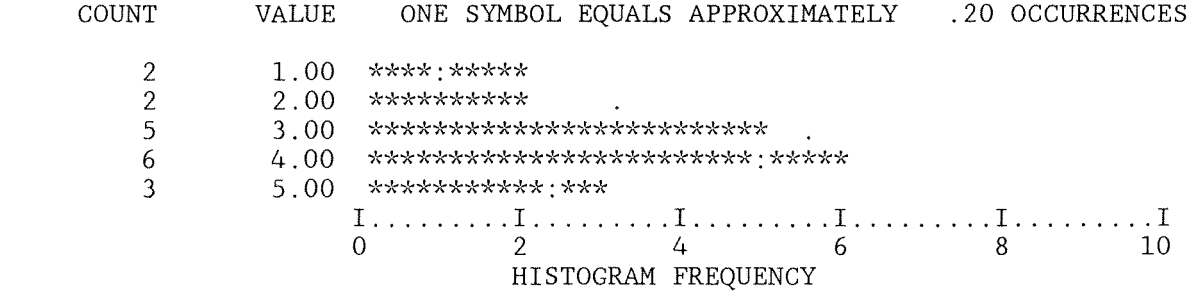
```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       1        2.00  **:**
       3        3.00  ****************     .
       8        4.00  ****************************************:
       6        5.00  ************************:*******
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

MEAN	4.056	STD ERR	.206	MEDIAN	4.000
MODE	4.000	STD DEV	.873	VARIANCE	.761
KURTOSIS	.197	S E KURT	1.038	SKEWNESS	-.713
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	73.000		

VALID CASES 18 MISSING CASES 2

Q10 Search Command

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	2	10.0	11.1	11.1
	2	2	10.0	11.1	22.2
	3	5	25.0	27.8	50.0
	4	6	30.0	33.3	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	



MEAN	3.333	STD ERR	.291	MEDIAN	3.500
MODE	4.000	STD DEV	1.237	VARIANCE	1.529
KURTOSIS	-.387	S E KURT	1.038	SKEWNESS	-.513
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	60.000		

VALID CASES 18 MISSING CASES 2

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 7
04:03:19 Nova University VAX 8550 ULTRIX 2.3

Q11 Connectors

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.0	5.6	5.6
	2	1	5.0	5.6	11.1
	3	5	25.0	27.8	38.9
	4	8	40.0	44.4	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .20 OCCURRENCES
1	1.00	*:***
1	2.00	***** .
5	3.00	************************* .
8	4.00	********************************:********
3	5.00	*************:*

I.....I.....I.....I.....I.....I
0 2 4 6 8 10
HISTOGRAM FREQUENCY

MEAN	3.611	STD ERR	.244	MEDIAN	4.000
MODE	4.000	STD DEV	1.037	VARIANCE	1.075
KURTOSIS	1.120	S E KURT	1.038	SKEWNESS	-.868
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	65.000		

VALID CASES 18 MISSING CASES 2

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 8
04:03:19 Nova University VAX 8550 ULTRIX 2.3

Q12 Print Command

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	2	10.0	11.1	11.1
	3	5	25.0	27.8	38.9
	4	4	20.0	22.2	61.1
	5	7	35.0	38.9	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       2        1.00  **:*******
       0        2.00          .
       5        3.00  ************************:**
       4        4.00  ********************      .
       7        5.00  ******************:******************
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	3.778	STD ERR	.308	MEDIAN	4.000
MODE	5.000	STD DEV	1.309	VARIANCE	1.712
KURTOSIS	.290	S E KURT	1.038	SKEWNESS	-.957
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	68.000		

VALID CASES 18 MISSING CASES 2

Q13 Truncation

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	1	5.0	5.9	5.9
	3	12	60.0	70.6	76.5
	4	2	10.0	11.8	88.2
	5	2	10.0	11.8	100.0
	.	2	10.0	MISSING	
	9	1	5.0	MISSING	
	TOTAL	20	100.0	100.0	

```
   COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .40 OCCURRENCES

       1       2.00  ***  .
      12       3.00  *******************:**********
       2       4.00  *****        .
       2       5.00  *:***
                    I.........I.........I.........I.........I.........I
                    0         4         8        12        16        20
                              HISTOGRAM FREQUENCY

MEAN          3.294      STD ERR        .187      MEDIAN        3.000
MODE          3.000      STD DEV        .772      VARIANCE       .596
KURTOSIS      1.562      S E KURT      1.063      SKEWNESS      1.257
S E SKEW       .550      RANGE         3.000      MINIMUM       2.000
MAXIMUM       5.000      SUM          56.000


VALID CASES      17      MISSING CASES     3
118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING  Page  10
04:03:20  Nova University                VAX 8550         ULTRIX 2.3


Q14       Publ Year


                                                          VALID     CUM
  VALUE LABEL                VALUE  FREQUENCY  PERCENT  PERCENT  PERCENT

                                0          1      5.0      5.6      5.6
                                1          1      5.0      5.6     11.1
                                2          1      5.0      5.6     16.7
                                3          4     20.0     22.2     38.9
                                4          5     25.0     27.8     66.7
                                5          6     30.0     33.3    100.0
                                .          2     10.0  MISSING
                                      -------  -------  -------
                           TOTAL         20    100.0    100.0


   COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

       1        .00  :****
       1       1.00  ****:
       1       2.00  *****        .
       4       3.00  ********************  .
       5       4.00  ***********************:*
       6       5.00  ***************:**************
                    I.........I.........I.........I.........I.........I
                    0         2         4         6         8        10
                              HISTOGRAM FREQUENCY
```

MEAN	3.611	STD ERR	.344	MEDIAN	4.000
MODE	5.000	STD DEV	1.461	VARIANCE	2.134
KURTOSIS	.920	S E KURT	1.038	SKEWNESS	-1.138
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	65.000		

VALID CASES 18 MISSING CASES 2

Q15 Language

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.0	5.6	5.6
	2	2	10.0	11.1	16.7
	3	6	30.0	33.3	50.0
	4	6	30.0	33.3	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .20 OCCURRENCES
1	1.00	**:**
2	2.00	********** .
6	3.00	******************************:
6	4.00	******************************:*
3	5.00	***********:***

I.....I.....I.....I.....I.....I
0 2 4 6 8 10
HISTOGRAM FREQUENCY

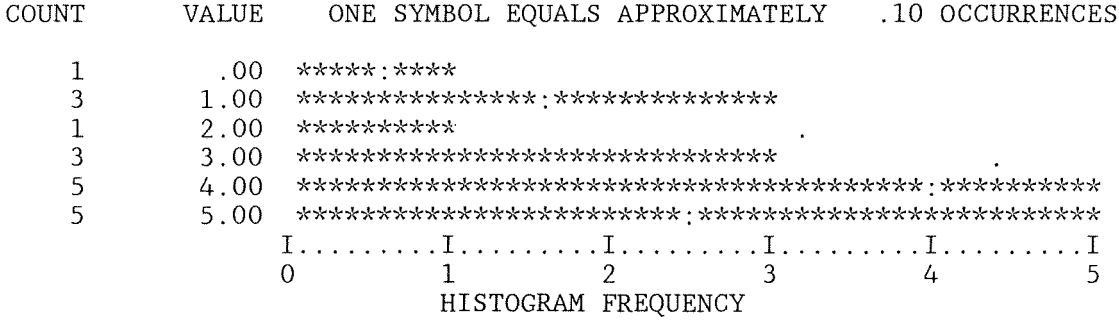
MEAN	3.444	STD ERR	.258	MEDIAN	3.500
MODE	3.000	STD DEV	1.097	VARIANCE	1.203
KURTOSIS	.026	S E KURT	1.038	SKEWNESS	-.444
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	62.000		

VALID CASES 18 MISSING CASES 2

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 12
04:03:20 Nova University VAX 8550 ULTRIX 2.3

Q16 Logging Out

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	0	1	5.0	5.6	5.6
	1	3	15.0	16.7	22.2
	2	1	5.0	5.6	27.8
	3	3	15.0	16.7	44.4
	4	5	25.0	27.8	72.2
	5	5	25.0	27.8	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	



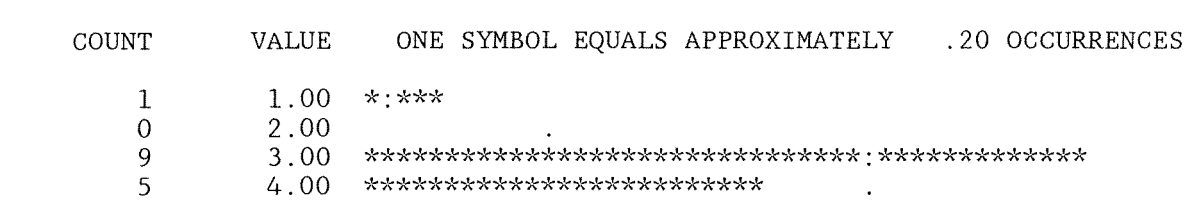
MEAN	3.278	STD ERR	.386	MEDIAN	4.000
MODE	4.000	STD DEV	1.638	VARIANCE	2.683
KURTOSIS	-.769	S E KURT	1.038	SKEWNESS	-.684
S E SKEW	.536	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	59.000		

VALID CASES 18 MISSING CASES 2

118 Apr 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 13
04:03:20 Nova University VAX 8550 ULTRIX 2.3

Q17 Overall

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.0	5.6	5.6
	3	9	45.0	50.0	55.6
	4	5	25.0	27.8	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	



MEAN	3.500	STD ERR	.232	MEDIAN	3.000
MODE	3.000	STD DEV	.985	VARIANCE	.971
KURTOSIS	1.293	S E KURT	1.038	SKEWNESS	-.415
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	63.000		

VALID CASES 18 MISSING CASES 2

PRECEDING TASK REQUIRED 0.77 SECONDS CPU TIME; 1.13 SECONDS ELAPSED.

53

53 COMMAND LINES READ.
0 ERRORS DETECTED.
0 WARNINGS ISSUED.
1 SECONDS CPU TIME.
2 SECONDS ELAPSED TIME.
END OF JOB.

Appendix M

Histograms of Performance Indicators

```
**********
during.dat
**********
 1 1 3 5 2 3 4 3 3 4 4 9 5 4
 2 1 3 4 5 4 5 4 5 9 4 4 4 4
 3 1 3 4 5 5 5 4 5 5 9 9 5 4
 4 1 3 5 4 2 2 3 2 9 9 9 4 3
 5 1 3 4 4 4 4 4 4 9 9 5 3 4
 6 1 3 3 4 4 3 3 4 4 9 9 4 4
 7 1 3 4 4 4 5 4 4 5 9 9 4 4
 8 1 3 4 4 4 4 4 4 9 9 9 4 4
 9 1 3 4 4 4 4 4 4 9 4 5 4 4
10 1 3 4 5 5 4 4 5 4 4 9 5 4
11 1 3 3 2 2 2 2 2 2 2 2 2 2
12 1 3 3 4 4 3 4 4 5 9 9 3 4
13 1 3 4 5 5 5 4 5 4 5 9 3 4
14 2 3 5 3 4 3 3 2 9 3 9 1 3
15 2 3 3 5 5 4 5 5 9 9 9 3 4
16 2 3 3 4 4 3 3 3 3 9 9 3 3
17 2 3 5 4 4 3 3 3 1 4 9 4 4
18 2 3 4 3 4 4 4 4 9 9 9 4 4

**********
during.r03
**********

SET WIDTH = 80

TITLE = PERFORMANCE INDICATORS DURING SEARCHES

DATA LIST FILE = 'during.dat' FIXED
     / Subject#  01-02
       Class     04
       Occasion  06
       Q07       08
       Q08       10
       Q09       12
       Q10       14
       Q11       16
       Q12       18
       Q13       20
       Q14       22
       Q15       24
       Q16       26
       Q17       28
```

```
VARIABLE LABELS
       Subject#  "Subject #"/
       Class     "Class"/
       Occasion  "Pretest"/
       Q07       "Terminal"/
       Q08       "Database Choice"/
       Q09       "Subject Terms"/
       Q10       "Search Command"/
       Q11       "Connectors"/
       Q12       "Print Command"/
       Q13       "Truncation"/
       Q14       "Publ Year"/
       Q15       "Language"/
       Q16       "Logging Out"/
       Q17       "Overall".

VALUE LABELS
       Class     1  'Full Period'
                 2  'Tour'.

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q14 (9) Q15 (9) Q16 (9) Q17 (9)

FREQUENCIES VARIABLES=Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
       / HISTOGRAM = NORMAL
       / STATISTICS = ALL

**********
during.o03
**********
118 Apr 91   SPSS-X Release 3.0 for VAX/UNIX                  Page   1
 04:39:59    Nova University              VAX 8550        ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 This software is functional through November 30, 1991.

 Try the new SPSS-X Release 3.0 features:

 * Interactive SPSS-X command execution          * Improvements in:
 * Online Help                                   *   REPORT
 * Nonlinear Regression                          *   TABLES
 * Time Series and Forecasting (TRENDS)          *   Simplified Syntax
 * Macro Facility                                *   Matrix I/O
See SPSS-X Users Guide, Third Edition for more information on these features.
```

```
  1  0
  2  0  SET WIDTH = 80
  3
  4  TITLE = PERFORMANCE INDICATORS DURING SEARCHES
  5
  6  DATA LIST FILE = 'during.dat' FIXED
  7       / Subject#  01-02
  8         Class     04
  9         Occasion  06
 10         Q07       08
 11         Q08       10
 12         Q09       12
 13         Q10       14
 14         Q11       16
 15         Q12       18
 16         Q13       20
 17         Q14       22
 18         Q15       24
 19         Q16       26
 20         Q17       28
 21

THE COMMAND ABOVE READS   1 RECORDS FROM during.dat

          VARIABLE   REC  START    END          FORMAT  WIDTH  DEC

          SUBJECT#     1      1      2          F           2    0
          CLASS        1      4      4          F           1    0
          OCCASION     1      6      6          F           1    0
          Q07          1      8      8          F           1    0
          Q08          1     10     10          F           1    0
          Q09          1     12     12          F           1    0
          Q10          1     14     14          F           1    0
          Q11          1     16     16          F           1    0
          Q12          1     18     18          F           1    0
          Q13          1     20     20          F           1    0
          Q14          1     22     22          F           1    0
          Q15          1     24     24          F           1    0
          Q16          1     26     26          F           1    0
          Q17          1     28     28          F           1    0
```



```
END OF DATALIST TABLE
```

```
 22  VARIABLE LABELS
 23         Subject#   "Subject #"/
 24         Class      "Class"/
 25         Occasion   "Pretest"/
 26         Q07        "Terminal"/
 27         Q08        "Database Choice"/
 28         Q09        "Subject Terms"/
 29         Q10        "Search Command"/
 30         Q11        "Connectors"/
 31         Q12        "Print Command"/
 32         Q13        "Truncation"/
 33         Q14        "Publ Year"/
 34         Q15        "Language"/
 35         Q16        "Logging Out"/
 36         Q17        "Overall".
 37
 38  VALUE LABELS
 39         Class      1  'Full Period'
 40                    2  'Tour'.
 41
 42  MISSING VALUE
 43   Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 44   Q14 (9) Q15 (9) Q16 (9) Q17 (9)
 45
 46  FREQUENCIES VARIABLES=Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
 47         / HISTOGRAM = NORMAL
 48         / STATISTICS = ALL
 49
 50
 51
 52


 There are 197168 bytes of memory available.
 The largest contiguous area has 197168 bytes.

***** MEMORY ALLOWS A TOTAL OF 7040 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
       THERE ALSO MAY BE UP TO 880 VALUE LABELS FOR EACH VARIABLE.

118 Apr 91 = PERFORMANCE INDICATORS DURING SEARCHES          Page   3
 04:40:01  Nova University                VAX 8550        ULTRIX 2.3


 Q07       Terminal
```

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	3	5	26.3	27.8	27.8
	4	9	47.4	50.0	77.8
	5	4	21.1	22.2	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       5        3.00  **********************:***
       9        4.00  ********************************************** .
       4        5.00  ******************:**
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	3.944	STD ERR	.171	MEDIAN	4.000
MODE	4.000	STD DEV	.725	VARIANCE	.526
KURTOSIS	-.904	S E KURT	1.038	SKEWNESS	.086
S E SKEW	.536	RANGE	2.000	MINIMUM	3.000
MAXIMUM	5.000	SUM	71.000		

VALID CASES 18 MISSING CASES 1

Q08 Database Choice

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	2	10.5	11.1	11.1
	3	2	10.5	11.1	22.2
	4	9	47.4	50.0	72.2
	5	5	26.3	27.8	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES
```

```
        2        2.00  ****:*****
        2        3.00  **********          .
        9        4.00  ************************************:********
        5        5.00  ********************:*****
                       I.........I.........I.........I.........I.........I
                       0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

MEAN	3.944	STD ERR	.221	MEDIAN	4.000
MODE	4.000	STD DEV	.938	VARIANCE	.879
KURTOSIS	.334	S E KURT	1.038	SKEWNESS	-.844
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	71.000		

VALID CASES 18 MISSING CASES 1

Q09 Subject Terms

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	2	10.5	11.1	11.1
	3	1	5.3	5.6	16.7
	4	11	57.9	61.1	77.8
	5	4	21.1	22.2	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .40 OCCURRENCES

       2        2.00  *:***
       1        3.00  ***         .
      11        4.00  ********************:********
       4        5.00  *********:
                      I.........I.........I.........I.........I.........I
                      0         4         8        12        16        20
                               HISTOGRAM FREQUENCY
```

MEAN	3.944	STD ERR	.206	MEDIAN	4.000
MODE	4.000	STD DEV	.873	VARIANCE	.761
KURTOSIS	1.354	S E KURT	1.038	SKEWNESS	-1.080
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	71.000		

VALID CASES 18 MISSING CASES 1
118 Apr 91 = PERFORMANCE INDICATORS DURING SEARCHES Page 6
04:40:01 Nova University VAX 8550 ULTRIX 2.3

Q10 Search Command

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	2	10.5	11.1	11.1
	3	5	26.3	27.8	38.9
	4	7	36.8	38.9	77.8
	5	4	21.1	22.2	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .20 OCCURRENCES
2	2.00	*******:**
5	3.00	************************ .
7	4.00	**********************************:
4	5.00	***************:****

I.....I.....I.....I.....I.....I
0 2 4 6 8 10
HISTOGRAM FREQUENCY

MEAN	3.722	STD ERR	.226	MEDIAN	4.000
MODE	4.000	STD DEV	.958	VARIANCE	.918
KURTOSIS	-.664	S E KURT	1.038	SKEWNESS	-.271
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	67.000		

VALID CASES 18 MISSING CASES 1
118 Apr 91 = PERFORMANCE INDICATORS DURING SEARCHES Page 7
04:40:01 Nova University VAX 8550 ULTRIX 2.3

Q11 Connectors

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT

2	1	5.3	5.6	5.6
3	6	31.6	33.3	38.9
4	10	52.6	55.6	94.4
5	1	5.3	5.6	100.0
.	1	5.3	MISSING	
TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       1        2.00  ***:*
       6        3.00  ******************************    .
      10        4.00  ****************************************:********
       1        5.00  *****  .
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

MEAN	3.611	STD ERR	.164	MEDIAN	4.000
MODE	4.000	STD DEV	.698	VARIANCE	.487
KURTOSIS	.462	S E KURT	1.038	SKEWNESS	-.445
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	65.000		

VALID CASES 18 MISSING CASES 1

Q12 Print Command

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	3	15.8	16.7	16.7
	3	3	15.8	16.7	33.3
	4	7	36.8	38.9	72.2
	5	5	26.3	27.8	100.0
	.	1	5.3	MISSING	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES
```

```
        3       2.00  *******:*******
        3       3.00  ***************          .
        7       4.00  ********************************:**
        5       5.00  ****************:********
                      I.........I.........I.........I.........I.........I
                      0         2         4         6         8        10
                                HISTOGRAM FREQUENCY
```

MEAN	3.778	STD ERR	.250	MEDIAN	4.000
MODE	4.000	STD DEV	1.060	VARIANCE	1.124
KURTOSIS	-.811	S E KURT	1.038	SKEWNESS	-.503
S E SKEW	.536	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	68.000		

VALID CASES 18 MISSING CASES 1

Q13 Truncation

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.3	10.0	10.0
	2	1	5.3	10.0	20.0
	3	1	5.3	10.0	30.0
	4	4	21.1	40.0	70.0
	5	3	15.8	30.0	100.0
	.	1	5.3	MISSING	
	9	8	42.1	MISSING	
	TOTAL	19	100.0	100.0	

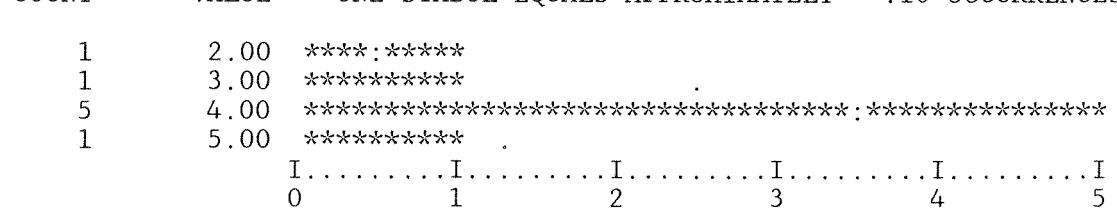
```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .10 OCCURRENCES

       1        1.00  ***:******
       1        2.00  **********  .
       1        3.00  **********           .
       4        4.00  ******************************:**********
       3        5.00  ******************:**********
                      I.........I.........I.........I.........I.........I
                      0         1         2         3         4         5
                                HISTOGRAM FREQUENCY
```

MEAN	3.700	STD ERR	.423	MEDIAN	4.000
MODE	4.000	STD DEV	1.337	VARIANCE	1.789
KURTOSIS	.458	S E KURT	1.334	SKEWNESS	-1.059
S E SKEW	.687	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	37.000		

VALID CASES 10 MISSING CASES 9

Q14 Publ Year

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	1	5.3	12.5	12.5
	3	1	5.3	12.5	25.0
	4	5	26.3	62.5	87.5
	5	1	5.3	12.5	100.0
	.	1	5.3	MISSING	
	9	10	52.6	MISSING	
	TOTAL	19	100.0	100.0	



MEAN	3.750	STD ERR	.313	MEDIAN	4.000
MODE	4.000	STD DEV	.886	VARIANCE	.786
KURTOSIS	1.851	S E KURT	1.481	SKEWNESS	-1.026
S E SKEW	.752	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	30.000		

VALID CASES 8 MISSING CASES 11

Q15 Language

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	1	5.3	25.0	25.0
	4	1	5.3	25.0	50.0
	5	2	10.5	50.0	100.0
	.	1	5.3	MISSING	
	9	14	73.7	MISSING	
	TOTAL	19	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .10 OCCURRENCES
1	2.00	***:******
0	3.00	.
1	4.00	********** .
2	5.00	********:**********

I.....I.....I.....I.....I.....I
0 1 2 3 4 5
HISTOGRAM FREQUENCY

MEAN	4.000	STD ERR	.707	MEDIAN	4.500
MODE	5.000	STD DEV	1.414	VARIANCE	2.000
KURTOSIS	1.500	S E KURT	2.619	SKEWNESS	-1.414
S E SKEW	1.014	RANGE	3.000	MINIMUM	2.000
MAXIMUM	5.000	SUM	16.000		

VALID CASES 4 MISSING CASES 15

Q16 Logging Out

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.3	5.6	5.6
	2	1	5.3	5.6	11.1
	3	5	26.3	27.8	38.9
	4	8	42.1	44.4	83.3

5	3	15.8	16.7	100.0
.	1	5.3	MISSING	
	---	---	---	
TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .20 OCCURRENCES

       1        1.00  *:***
       1        2.00  *****     .
       5        3.00  *************************    .
       8        4.00  ********************************:********
       3        5.00  *************:*
                     I.........I.........I.........I.........I.........I
                     0         2         4         6         8        10
                               HISTOGRAM FREQUENCY
```

MEAN	3.611	STD ERR	.244	MEDIAN	4.000
MODE	4.000	STD DEV	1.037	VARIANCE	1.075
KURTOSIS	1.120	S E KURT	1.038	SKEWNESS	-.868
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	65.000		

VALID CASES 18 MISSING CASES 1

Q17 Overall

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	1	5.3	5.6	5.6
	3	3	15.8	16.7	22.2
	4	14	73.7	77.8	100.0
	.	1	5.3	MISSING	
		---	---	---	
	TOTAL	19	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY    .40 OCCURRENCES
```

```
        1       2.00  :**
        3       3.00  ********      .
       14       4.00  *************************:*********
                     I.........I.........I.........I.........I.........I
                     0         4         8        12        16        20
                               HISTOGRAM FREQUENCY
```

MEAN	3.722	STD ERR	.135	MEDIAN	4.000
MODE	4.000	STD DEV	.575	VARIANCE	.330
KURTOSIS	3.849	S E KURT	1.038	SKEWNESS	-2.072
S E SKEW	.536	RANGE	2.000	MINIMUM	2.000
MAXIMUM	4.000	SUM	67.000		

```
VALID CASES      18      MISSING CASES     1
118 Apr 91 = PERFORMANCE INDICATORS DURING SEARCHES          Page  14
04:40:02  Nova University                VAX 8550         ULTRIX 2.3


PRECEDING TASK REQUIRED  0.74 SECONDS CPU TIME; 1.10 SECONDS ELAPSED.

  53

    53 COMMAND LINES READ.
     0 ERRORS DETECTED.
     0 WARNINGS ISSUED.
     1 SECONDS CPU TIME.
     3 SECONDS ELAPSED TIME.
       END OF JOB.
```

Appendix N

Student's t-test on Overall Skills Before and After

```
********
resp.dat
********

01 1 0 3
02 1 2 5
03 1 0 4
04 1 4 4
05 1 0 4
06 1 0 4
07 1 0 4
08 1 0 3
09 1 0 3
10 1 0 5
11 1 0 3
12 1 0 3
13 1 0 1
14 2 3 5
15 2 0 3
16 2 0 3
17 4 0 3
18 2 3 3

********
resp.r01
********

SET WIDTH = 80
TITLE = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING
DATA LIST FILE = 'resp.dat' FIXED
     /  Subject#   01-02
        Before        06
        After         08
VARIABLE LABELS
        Subject#    "Subject #"/
        Before      "Before DIALOG Search"/
        After       "After DIALOG Search".
TEMPORARY
FREQUENCIES VARIABLES = Before
  / HISTOGRAM         = NORMAL
  / STATISTICS        = ALL

TEMPORARY
FREQUENCIES VARIABLES = After
  / HISTOGRAM         = NORMAL
  / STATISTICS        = ALL
```

```
T-TEST PAIRS = Before,After

********
resp.o01
********
124 Mar 91    SPSS-X Release 3.0 for VAX/UNIX                    Page   1
 00:47:35     Nova University                VAX 8550          ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 Trial period from March 1, 1991 for 1 month.

 Try the new SPSS-X Release 3.0 features:

 * Interactive SPSS-X command execution          * Improvements in:
 * Online Help                                    *   REPORT
 * Nonlinear Regression                           *   TABLES
 * Time Series and Forecasting (TRENDS)           *   Simplified Syntax
 * Macro Facility                                 *   Matrix I/O

 See SPSS-X Users Guide, Third Edition for more information on these features.

    1  0
    2  0  SET WIDTH = 80
    3  TITLE = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING
    4  DATA LIST FILE = 'resp.dat' FIXED
    5       /  Subject#   01-02
    6          Before        06
    7          After         08

 THE COMMAND ABOVE READS    1 RECORDS FROM resp.dat

           VARIABLE   REC  START    END         FORMAT  WIDTH  DEC

           SUBJECT#     1      1      2         F           2    0
           BEFORE       1      6      6         F           1    0
           AFTER        1      8      8         F           1    0

 END OF DATALIST TABLE


    8  VARIABLE LABELS
    9          Subject#    "Subject #"/
   10          Before      "Before DIALOG Search"/
   11          After       "After DIALOG Search".
   12  TEMPORARY
   13  FREQUENCIES VARIABLES = Before
   14    / HISTOGRAM         = NORMAL
   15    / STATISTICS        = ALL
   16
```

```
There are 198360 bytes of memory available.
The largest contiguous area has 198360 bytes.

***** MEMORY ALLOWS A TOTAL OF 7083 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
      THERE ALSO MAY BE UP TO  885 VALUE LABELS FOR EACH VARIABLE.

124 Mar 91 = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING      Page   2
 00:47:36  Nova University                VAX 8550         ULTRIX 2.3


 BEFORE    Before DIALOG Search


                                                          VALID     CUM
   VALUE LABEL                VALUE  FREQUENCY  PERCENT  PERCENT  PERCENT

                                  0         14     70.0     77.8     77.8
                                  2          1      5.0      5.6     83.3
                                  3          2     10.0     11.1     94.4
                                  4          1      5.0      5.6    100.0
                                  .          2     10.0  MISSING
                                        -------  -------  -------
                             TOTAL         20    100.0    100.0


  COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .40 OCCURRENCES

       14        .00  ***********:***********************
        0       1.00              .
        1       2.00  ***    .
        2       3.00  **:**
        1       4.00  :**
                      I.........I.........I.........I.........I.........I
                      0         4         8        12        16        20
                                HISTOGRAM FREQUENCY

 MEAN           .667      STD ERR        .313      MEDIAN         .000
 MODE           .000      STD DEV       1.328      VARIANCE      1.765
 KURTOSIS      1.466      S E KURT      1.038      SKEWNESS      1.713
 S E SKEW       .536      RANGE         4.000      MINIMUM        .000
 MAXIMUM       4.000      SUM          12.000


 VALID CASES      18      MISSING CASES     2
124 Mar 91 = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING      Page   3
 00:47:36  Nova University                VAX 8550         ULTRIX 2.3


 PRECEDING TASK REQUIRED  0.17 SECONDS CPU TIME;  0.33 SECONDS ELAPSED.
```

```
17  TEMPORARY
18  FREQUENCIES VARIABLES = After
19    / HISTOGRAM         = NORMAL
20    / STATISTICS        = ALL
21
```

There are 199624 bytes of memory available.
The largest contiguous area has 199584 bytes.

***** MEMORY ALLOWS A TOTAL OF 7127 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
THERE ALSO MAY BE UP TO 891 VALUE LABELS FOR EACH VARIABLE.

124 Mar 91 = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING Page 4
00:47:36 Nova University VAX 8550 ULTRIX 2.3

AFTER After DIALOG Search

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.0	5.6	5.6
	3	9	45.0	50.0	55.6
	4	5	25.0	27.8	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

```
   COUNT      VALUE    ONE SYMBOL EQUALS APPROXIMATELY   .20 OCCURRENCES

       1       1.00  *:***
       0       2.00              .
       9       3.00  ********************************:*************
       5       4.00  *************************      .
       3       5.00  ***********:***
                    I.........I.........I.........I.........I.........I
                    0         2         4         6         8        10
                              HISTOGRAM FREQUENCY
```

MEAN	3.500	STD ERR	.232	MEDIAN	3.000
MODE	3.000	STD DEV	.985	VARIANCE	.971
KURTOSIS	1.293	S E KURT	1.038	SKEWNESS	-.415
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	63.000		

124 Mar 91 = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING Page 5
00:47:36 Nova University VAX 8550 ULTRIX 2.3

PRECEDING TASK REQUIRED 0.10 SECONDS CPU TIME; 0.11 SECONDS ELAPSED.

```
  22  T-TEST PAIRS = Before,After
  23
  24
  25
```

There are 199616 bytes of memory available.
The largest contiguous area has 199264 bytes.

THE T-TEST PROBLEM REQUIRES 64 BYTES OF WORKSPACE

124 Mar 91 = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING Page 6
00:47:37 Nova University VAX 8550 ULTRIX 2.3

- - - - - - - - - - - - - - - - - - - T - T E S T - - - - - - - - - - - - - - - - - -

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
BEFORE	Before DIALOG Search			
	18	0.6667	1.328	0.313
	18	3.5000	0.985	0.232
AFTER	After DIALOG Search			

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-2.8333	1.339	0.316	0.360	0.143	-8.97	17	0.000

124 Mar 91 = STUDENT PERCEIVED GAIN IN DIALOG SEARCHING Page 7
00:47:37 Nova University VAX 8550 ULTRIX 2.3

PRECEDING TASK REQUIRED 0.08 SECONDS CPU TIME; 0.23 SECONDS ELAPSED.

```
  26
```

```
26 COMMAND LINES READ.
 0 ERRORS DETECTED.
 0 WARNINGS ISSUED.
 1 SECONDS CPU TIME.
 2 SECONDS ELAPSED TIME.
   END OF JOB.
```

Appendix O

MANOVA Student Responses Before Searching

```
**********
before.dat
**********
 1 1 1 3 1 0 1 3 1 0 1 1 0 0
 2 1 1 3 4 5 5 4 4 9 3 4 4 2
 3 1 1 0 1 1 0 1 0 0 0 0 0 0
 4 1 1 4 4 4 4 5 5 4 4 4 5 4
 5 1 1 3 0 0 0 1 3 0 0 0 0 0
 6 1 1 3 0 0 0 0 0 0 0 0 0 0
 7 1 1 3 0 0 0 0 1 0 0 0 0 0
 8 1 1 1 0 0 0 0 0 0 1 1 0 0
 9 1 1 3 2 4 0 0 0 0 0 0 0 0
10 1 1 1 2 3 1 0 0 0 0 0 0 0
11 1 1 0 2 3 0 0 0 0 1 1 0 0
12 1 1 0 0 0 0 0 0 0 0 0 0 0
13 1 1 3 3 4 3 2 2 2 1 2 0 0
14 2 1 3 2 4 3 3 3 3 3 3 3 3
15 2 1 0 3 2 0 0 0 0 0 0 0 0
16 2 1 0 0 0 0 0 0 0 0 0 0 0
17 2 1 1 1 2 0 0 0 0 0 1 0 0
18 2 1 3 3 4 5 3 3 2 1 1 0 3

**********
before.r01
**********

SET WIDTH = 80

TITLE = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING

DATA LIST FILE = 'before.dat' FIXED
     / Subject#  01-02
       Class     04
       Occasion  06
       Q07       08
       Q08       10
       Q09       12
       Q10       14
       Q11       16
       Q12       18
       Q13       20
       Q14       22
       Q15       24
       Q16       26
       Q17       28
```

```
VARIABLE LABELS
       Subject#  "Subject #"
       Class     "Class"
       Occasion  "Pretest"
       Q07       "Terminal"
       Q08       "Database Choice"
       Q09       "Subject Terms"
       Q10       "Search Command"
       Q11       "Connectors"
       Q12       "Print Command"
       Q13       "Truncation"
       Q14       "Publ Year"
       Q15       "Language"
       Q16       "Logging Out"
       Q17       "Overall"

VALUE LABELS
       Class     1  'Full Period'
                 2  'Tour'

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q14 (9) Q15 (9) Q16 (9) Q17 (9)

MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
       by Class (1,2)

       / PRINT = CELLINFO       (ALL)
                 HOMOGENEITY    (ALL)
                 DESIGN         (ONEWAY)
                 ERROR          (ALL)
                 SIGNIF         (EIGEN)
       / PLOT =  STEMLEAF
                 BOXPLOTS
       / DISCRIM                (ALL)
       / DESIGN /


**********
before.o01
**********
124 Mar 91   SPSS-X Release 3.0 for VAX/UNIX                  Page   1
 00:48:34    Nova University                VAX 8550       ULTRIX 2.3


 For ULTRIX 2.3          Nova University      License Number 19439
 Trial period from March 1, 1991 for 1 month.

 Try the new SPSS-X Release 3.0 features:
```

```
* Interactive SPSS-X command execution          * Improvements in:
* Online Help                                   *   REPORT
* Nonlinear Regression                          *   TABLES
* Time Series and Forecasting (TRENDS)          *   Simplified Syntax
* Macro Facility                                *   Matrix I/O
```

See SPSS-X Users Guide, Third Edition for more information on these features.

```
  1  0
  2  0  SET WIDTH = 80
  3
  4  TITLE = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING
  5
  6  DATA LIST FILE = 'before.dat' FIXED
  7       / Subject#  01-02
  8         Class     04
  9         Occasion  06
 10         Q07       08
 11         Q08       10
 12         Q09       12
 13         Q10       14
 14         Q11       16
 15         Q12       18
 16         Q13       20
 17         Q14       22
 18         Q15       24
 19         Q16       26
 20         Q17       28
 21
```

THE COMMAND ABOVE READS 1 RECORDS FROM before.dat

VARIABLE	REC	START	END	FORMAT	WIDTH	DEC
SUBJECT#	1	1	2	F	2	0
CLASS	1	4	4	F	1	0
OCCASION	1	6	6	F	1	0
Q07	1	8	8	F	1	0
Q08	1	10	10	F	1	0
Q09	1	12	12	F	1	0
Q10	1	14	14	F	1	0
Q11	1	16	16	F	1	0
Q12	1	18	18	F	1	0
Q13	1	20	20	F	1	0
Q14	1	22	22	F	1	0
Q15	1	24	24	F	1	0
Q16	1	26	26	F	1	0
Q17	1	28	28	F	1	0

```
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page  2
 00:48:34  Nova University                VAX 8550         ULTRIX 2.3


 END OF DATALIST TABLE


   22  VARIABLE LABELS
   23         Subject#  "Subject #"
   24         Class     "Class"
   25         Occasion  "Pretest"
   26         Q07       "Terminal"
   27         Q08       "Database Choice"
   28         Q09       "Subject Terms"
   29         Q10       "Search Command"
   30         Q11       "Connectors"
   31         Q12       "Print Command"
   32         Q13       "Truncation"
   33         Q14       "Publ Year"
   34         Q15       "Language"
   35         Q16       "Logging Out"
   36         Q17       "Overall"
   37
   38  VALUE LABELS
   39         Class     1  'Full Period'
   40                   2  'Tour'
   41
   42  MISSING VALUE
   43   Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
   44   Q14 (9) Q15 (9) Q16 (9) Q17 (9)
   45
   46  MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
   47         by Class (1,2)
   48
   49         / PRINT = CELLINFO       (ALL)
   50                   HOMOGENEITY    (ALL)
   51                   DESIGN         (ONEWAY)
   52                   ERROR          (ALL)
   53                   SIGNIF         (EIGEN)
   54         / PLOT =  STEMLEAF
   55                   BOXPLOTS
   56         / DISCRIM                (ALL)
   57         / DESIGN /
   58
   59
   60
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page  3
 00:48:35  Nova University                VAX 8550         ULTRIX 2.3
```

```
* * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * *


       17 cases accepted.
        0 cases rejected because of out-of-range factor values.
        2 cases rejected because of missing data.
        2 non-empty cells.

        1 design will be processed.

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
              CELL NUMBER
                1    2
Variable
  CLASS         1    2

Cell Means and Standard Deviations
Variable .. Q07              Terminal
     FACTOR           CODE                  Mean  Std. Dev.          N

 CLASS           Full Per                  2.000      1.477         12
 CLASS           Tour                      1.400      1.517          5
For entire sample                          1.824      1.468         17

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Variable .. Q08              Database Choice
     FACTOR           CODE                  Mean  Std. Dev.          N

 CLASS           Full Per                  1.250      1.357         12
 CLASS           Tour                      1.800      1.304          5
For entire sample                          1.412      1.326         17

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Variable .. Q09              Subject Terms
     FACTOR           CODE                  Mean  Std. Dev.          N

 CLASS           Full Per                  1.583      1.832         12
 CLASS           Tour                      2.400      1.673          5
For entire sample                          1.824      1.776         17

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Variable .. Q10              Search Command
     FACTOR           CODE                  Mean  Std. Dev.          N

 CLASS           Full Per                   .750      1.357         12
 CLASS           Tour                      1.600      2.302          5
For entire sample                          1.000      1.658         17
```

```
 Variable .. Q11              Connectors
      FACTOR            CODE                  Mean  Std. Dev.          N

  CLASS            Full Per                  1.000      1.595         12
  CLASS            Tour                      1.200      1.643          5
 For entire sample                          1.059      1.560         17
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page  4
 00:48:36  Nova University                VAX 8550         ULTRIX 2.3


* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

 Cell Means and Standard Deviations  (CONT.)
 Variable .. Q12              Print Command
      FACTOR            CODE                  Mean  Std. Dev.          N

  CLASS            Full Per                  1.000      1.595         12
  CLASS            Tour                      1.200      1.643          5
 For entire sample                          1.059      1.560         17

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Variable .. Q13              Truncation
      FACTOR            CODE                  Mean  Std. Dev.          N

  CLASS            Full Per                   .500      1.243         12
  CLASS            Tour                      1.000      1.414          5
 For entire sample                           .647      1.272         17

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Variable .. Q14              Publ Year
      FACTOR            CODE                  Mean  Std. Dev.          N

  CLASS            Full Per                   .667      1.155         12
  CLASS            Tour                       .800      1.304          5
 For entire sample                           .706      1.160         17

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Variable .. Q15              Language
      FACTOR            CODE                  Mean  Std. Dev.          N

  CLASS            Full Per                   .750      1.215         12
  CLASS            Tour                      1.000      1.225          5
 For entire sample                           .824      1.185         17

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Variable .. Q16              Logging Out
      FACTOR            CODE                  Mean  Std. Dev.          N

  CLASS            Full Per                   .417      1.443         12
  CLASS            Tour                       .600      1.342          5
 For entire sample                           .471      1.375         17
```

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Variable .. Q17                Overall
      FACTOR            CODE                    Mean  Std. Dev.          N

  CLASS            Full Per                     .333      1.155         12
  CLASS            Tour                        1.200      1.643          5
 For entire sample                             .588      1.326         17
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page  5
 00:48:36  Nova University                 VAX 8550         ULTRIX 2.3


* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

 Univariate Homogeneity of Variance Tests

 Variable .. Q07                  Terminal

       Cochrans C(8,2) =                          .51318, P =  .942 (approx.)
       Bartlett-Box F(1,359) =                    .00376, P =  .951

 Variable .. Q08                  Database Choice

       Cochrans C(8,2) =                          .51990, P =  .913 (approx.)
       Bartlett-Box F(1,359) =                    .00840, P =  .927

 Variable .. Q09                  Subject Terms

       Cochrans C(8,2) =                          .54516, P =  .804 (approx.)
       Bartlett-Box F(1,359) =                    .04274, P =  .836

 Variable .. Q10                  Search Command

       Cochrans C(8,2) =                          .74220, P =  .156 (approx.)
       Bartlett-Box F(1,359) =                   1.71108, P =  .192

 Variable .. Q11                  Connectors

       Cochrans C(8,2) =                          .51473, P =  .936 (approx.)
       Bartlett-Box F(1,359) =                    .00470, P =  .945

 Variable .. Q12                  Print Command

       Cochrans C(8,2) =                          .51473, P =  .936 (approx.)
       Bartlett-Box F(1,359) =                    .00470, P =  .945

 Variable .. Q13                  Truncation

       Cochrans C(8,2) =                          .56410, P =  .724 (approx.)
       Bartlett-Box F(1,359) =                    .09263, P =  .761
```

Variable .. Q14 Publ Year

Cochrans C(8,2) = .56044, P = .739 (approx.)
Bartlett-Box F(1,359) = .08207, P = .775

Variable .. Q15 Language

Cochrans C(8,2) = .50382, P = .983 (approx.)
Bartlett-Box F(1,359) = .00031, P = .986

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Univariate Homogeneity of Variance Tests (CONT.)

Variable .. Q16 Logging Out

Cochrans C(8,2) = .53648, P = .841 (approx.)
Bartlett-Box F(1,359) = .02799, P = .867

Variable .. Q17 Overall

Cochrans C(8,2) = .66942, P = .338 (approx.)
Bartlett-Box F(1,359) = .73492, P = .392

- -

Cell Number .. 1
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	24.000					
Q08	6.000	20.250				
Q09	5.000	25.250	36.917			
Q10	11.000	16.750	16.750	20.250		
Q11	14.000	15.000	10.000	20.000	28.000	
Q12	17.000	12.000	9.000	18.000	23.000	28.000
Q13	10.000	14.500	14.500	17.500	18.000	18.000
Q14	7.000	12.000	10.333	14.000	17.000	15.000
Q15	8.000	13.750	12.750	16.250	18.000	16.000
Q16	10.000	13.750	12.083	16.250	20.000	20.000
Q17	8.000	11.000	9.667	13.000	16.000	16.000

	Q13	Q14	Q15	Q16	Q17
Q13	17.000				
Q14	14.000	14.667			

Q15	15.500	15.000	16.250			
Q16	17.500	16.667	16.250	22.917		
Q17	14.000	13.333	13.000	18.333	14.667	

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.182					
Q08	.545	1.841				
Q09	.455	2.295	3.356			
Q10	1.000	1.523	1.523	1.841		
Q11	1.273	1.364	.909	1.818	2.545	
Q12	1.545	1.091	.818	1.636	2.091	2.545
Q13	.909	1.318	1.318	1.591	1.636	1.636
Q14	.636	1.091	.939	1.273	1.545	1.364
Q15	.727	1.250	1.159	1.477	1.636	1.455
Q16	.909	1.250	1.098	1.477	1.818	1.818

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 1 (CONT.)

Variance-Covariance matrix (CONT.)

	Q07	Q08	Q09	Q10	Q11	Q12
Q17	.727	1.000	.879	1.182	1.455	1.455

	Q13	Q14	Q15	Q16	Q17
Q13	1.545				
Q14	1.273	1.333			
Q15	1.409	1.364	1.477		
Q16	1.591	1.515	1.477	2.083	
Q17	1.273	1.212	1.182	1.667	1.333

Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	1.477					
Q08	.272	1.357				
Q09	.168	.924	1.832			
Q10	.499	.827	.613	1.357		
Q11	.540	.630	.311	.840	1.595	
Q12	.656	.504	.280	.756	.821	1.595
Q13	.495	.782	.579	.943	.825	.825
Q14	.373	.696	.444	.812	.839	.740
Q15	.405	.758	.521	.896	.844	.750
Q16	.426	.638	.415	.754	.790	.790
Q17	.426	.638	.415	.754	.790	.790

	Q13	Q14	Q15	Q16	Q17
Q13	1.243				
Q14	.887	1.155			
Q15	.933	.972	1.215		
Q16	.887	.909	.842	1.443	
Q17	.887	.909	.842	1.000	1.155

>Note # 12171
>Singular variance-covariance matrix for this cell.

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 8
00:48:36 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 2
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	9.200					
Q08	3.400	6.800				
Q09	9.200	6.400	11.200			
Q10	12.800	6.600	12.800	21.200		
Q11	9.600	4.200	9.600	14.400	10.800	
Q12	9.600	4.200	9.600	14.400	10.800	10.800
Q13	8.000	3.000	8.000	11.000	9.000	9.000
Q14	6.400	1.800	6.400	7.600	7.200	7.200
Q15	6.000	1.000	6.000	6.000	6.000	6.000
Q16	4.800	.600	4.800	4.200	5.400	5.400
Q17	9.600	4.200	9.600	14.400	10.800	10.800

	Q13	Q14	Q15	Q16	Q17
Q13	8.000				
Q14	7.000	6.800			
Q15	6.000	6.000	6.000		
Q16	6.000	6.600	6.000	7.200	
Q17	9.000	7.200	6.000	5.400	10.800

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.300					
Q08	.850	1.700				
Q09	2.300	1.600	2.800			
Q10	3.200	1.650	3.200	5.300		

Q11	2.400	1.050	2.400	3.600	2.700	
Q12	2.400	1.050	2.400	3.600	2.700	2.700
Q13	2.000	.750	2.000	2.750	2.250	2.250
Q14	1.600	.450	1.600	1.900	1.800	1.800
Q15	1.500	.250	1.500	1.500	1.500	1.500
Q16	1.200	.150	1.200	1.050	1.350	1.350
Q17	2.400	1.050	2.400	3.600	2.700	2.700

	Q13	Q14	Q15	Q16	Q17
Q13	2.000				
Q14	1.750	1.700			
Q15	1.500	1.500	1.500		
Q16	1.500	1.650	1.500	1.800	
Q17	2.250	1.800	1.500	1.350	2.700

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 2 (CONT.)
Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	1.517					
Q08	.430	1.304				
Q09	.906	.733	1.673			
Q10	.917	.550	.831	2.302		
Q11	.963	.490	.873	.952	1.643	
Q12	.963	.490	.873	.952	1.000	1.643
Q13	.933	.407	.845	.845	.968	.968
Q14	.809	.265	.733	.633	.840	.840
Q15	.808	.157	.732	.532	.745	.745
Q16	.590	.086	.535	.340	.612	.612
Q17	.963	.490	.873	.952	1.000	1.000

	Q13	Q14	Q15	Q16	Q17
Q13	1.414				
Q14	.949	1.304			
Q15	.866	.939	1.225		
Q16	.791	.943	.913	1.342	
Q17	.968	.840	.745	.612	1.643

>Note # 12171
>Singular variance-covariance matrix for this cell.

>Note # 12172
>Singular variance-covariance matrix for all cells.

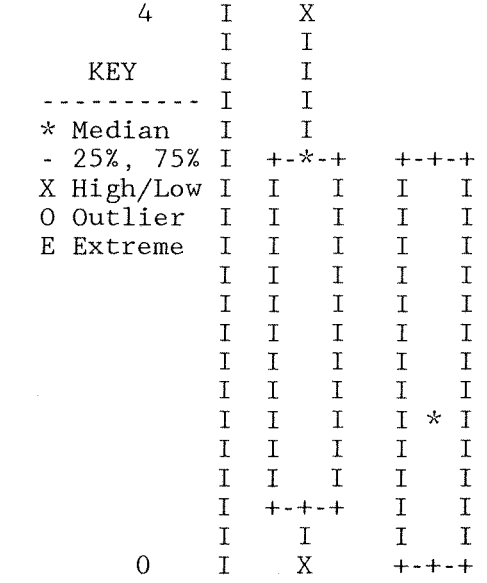
Boxs M-test cannot be performed.

- -

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 10
00:48:37 Nova University VAX 8550 ULTRIX 2.3

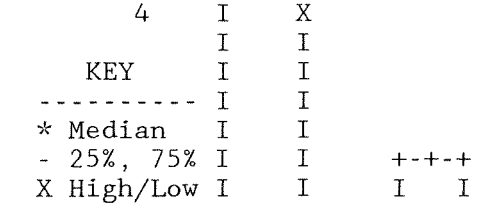
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

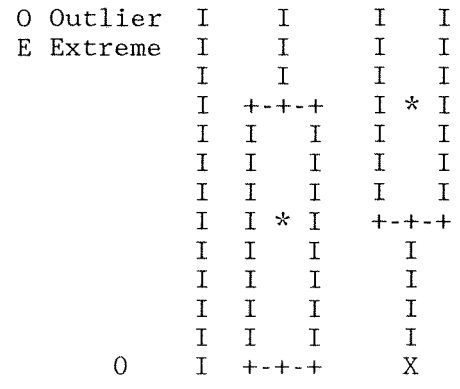
Box-Plots For Variable .. Q07 Terminal



- -

Box-Plots For Variable .. Q08 Database Choice

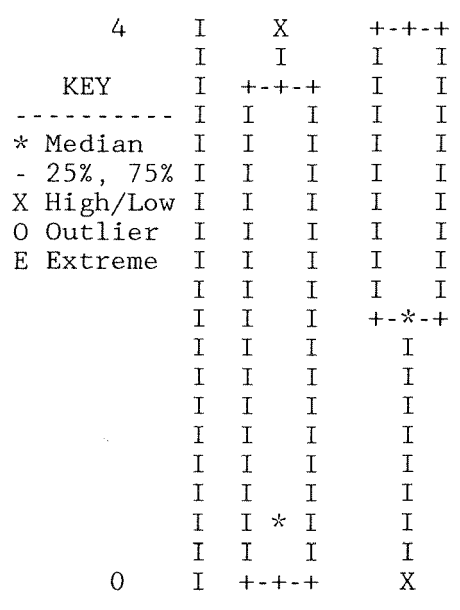




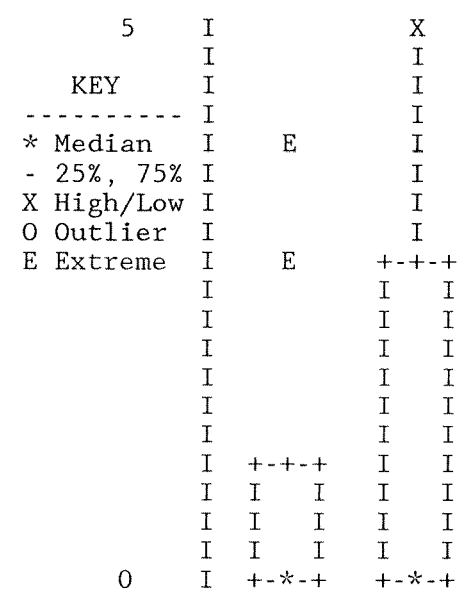
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 11
00:48:37 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Box-Plots For Variable .. Q09 Subject Terms

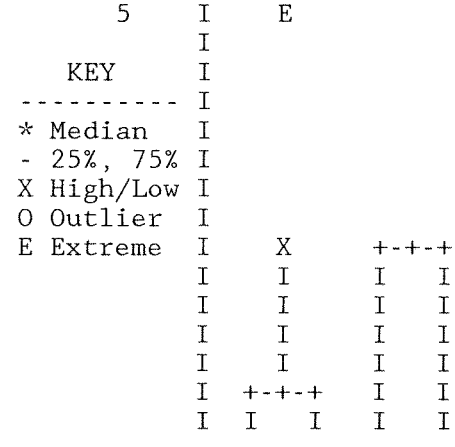


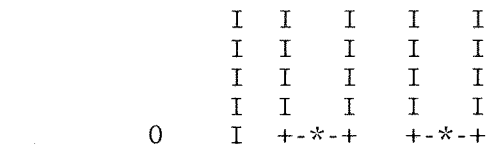
Box-Plots For Variable .. Q10 Search Command



* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

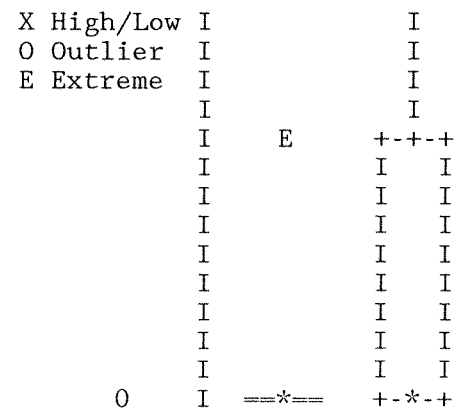
Box-Plots For Variable .. Q11 Connectors



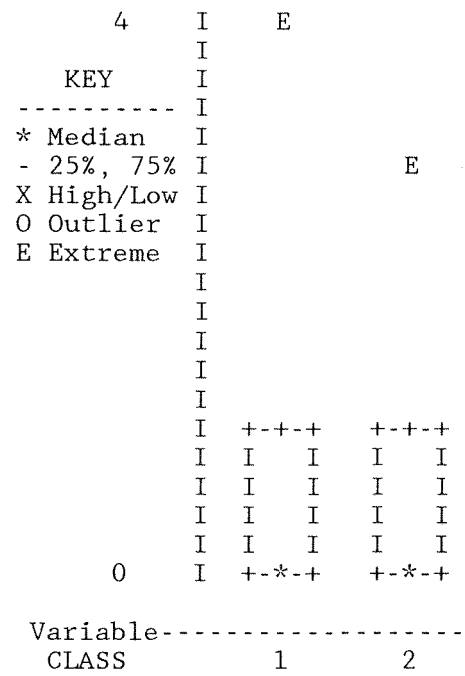


Variable----------
CLASS 1 2

- - - -

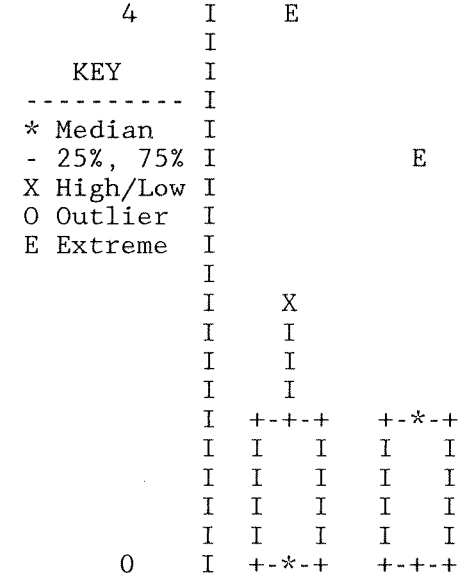


Box-Plots For Variable .. Q14 Publ Year

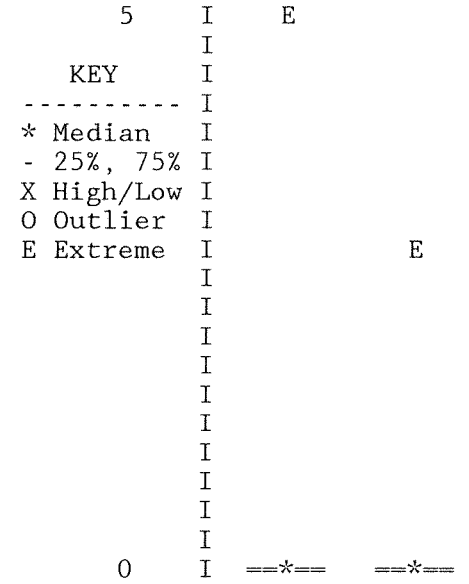


* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Box-Plots For Variable .. Q15 Language



Box-Plots For Variable .. Q16 Logging Out



```
       Variable-------------------------------------------------------
        CLASS          1       2

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page 15
 00:48:37  Nova University                 VAX 8550         ULTRIX 2.3

* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  Box-Plots For Variable .. Q17          Overall

            4    I    E
                 I
         KEY     I
      ---------- I
      * Median   I
      - 25%, 75% I          +-+-+
      X High/Low I          I   I
      O Outlier  I          I   I
      E Extreme  I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
                 I          I   I
            0    I  ==*==   +-*-+

       Variable-------------------------------------------------------
        CLASS          1       2

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING  Page 16
 00:48:37  Nova University                 VAX 8550         ULTRIX 2.3

* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  Stem-and-leaf display for variable .. Q07          Terminal

      0 . 00000
      1 . 000
      2 .
      3 . 00000000
      4 . 0
```

- -

Stem-and-leaf display for variable .. Q08 Database Choice

```
     0 . 000000
     1 . 000
     2 . 0000
     3 . 000
     4 . 0
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q09 Subject Terms

```
     0 . 0000000
     1 . 0
     2 . 00
     3 . 00
     4 . 00000
```

- -

Stem-and-leaf display for variable .. Q10 Search Command

```
     0 . 0000000000000
     2 . 00
     4 . 00
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q11 Connectors

```
     0 . 000000000000
     2 . 0000
     4 . 0
```

- -

Stem-and-leaf display for variable .. Q12 Print Command

```
     0 . 000000000000
     2 . 0000
     4 . 0
```

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 19
00:48:37 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q13 Truncation

```
0 . 0000000000000
1 .
2 . 00
3 . 0
4 . 0
```

Stem-and-leaf display for variable .. Q14 Publ Year

```
0 . 0000000000
1 . 00000
2 .
3 . 0
4 . 0
```

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 20
00:48:37 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q15 Language

```
0 . 000000000
1 . 00000
2 . 0
3 . 0
4 . 0
```

Stem-and-leaf display for variable .. Q16 Logging Out

```
0 . 0000000000000000
2 . 0
4 . 0
```

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 21
00:48:37 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q17 Overall

```
    0 . 00000000000000
    1 .
    2 .
    3 . 00
    4 . 0
```

- -

One-way Basis for factor CLASS

	1	2
1	1.000	1.000
2	1.000	-1.000

Partition	DF	Columns
1	1	2

- -

Correspondence between Effects and Columns of BETWEEN-Subjects DESIGN 1

Starting Column	Ending Column	Effect Name
1	1	CONSTANT
2	2	CLASS

- -

WITHIN CELLS Correlations with Std. Devs. on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	1.488					
Q08	.314	1.343				
Q09	.355	.877	1.791			
Q10	.642	.697	.662	1.662		
Q11	.658	.593	.454	.858	1.608	
Q12	.741	.500	.430	.808	.871	1.608
Q13	.625	.673	.649	.885	.867	.867
Q14	.502	.573	.521	.724	.839	.769
Q15	.515	.601	.573	.733	.817	.749
Q16	.468	.503	.444	.579	.743	.743
Q17	.605	.579	.550	.843	.853	.853

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

WITHIN CELLS Correlations with Std. Devs. on Diagonal (CONT.)

	Q13	Q14	Q15	Q16	Q17
Q13	1.291				
Q14	.906	1.196			
Q15	.912	.961	1.218		
Q16	.856	.915	.860	1.417	
Q17	.912	.878	.798	.857	1.303

- -

Statistics for WITHIN CELLS correlations

Log(Determinant) = -19.82143
Bartlett test of sphericity = 208.12502 with 55 D. F.
Significance = .000

F(max) criterion = 2.24146 with (11,15) D. F.

- -

WITHIN CELLS Variances and Covariances

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.213					
Q08	.627	1.803				
Q09	.947	2.110	3.208			
Q10	1.587	1.557	1.970	2.763		
Q11	1.573	1.280	1.307	2.293	2.587	
Q12	1.773	1.080	1.240	2.160	2.253	2.587
Q13	1.200	1.167	1.500	1.900	1.800	1.800
Q14	.893	.920	1.116	1.440	1.613	1.480
Q15	.933	.983	1.250	1.483	1.600	1.467
Q16	.987	.957	1.126	1.363	1.693	1.693
Q17	1.173	1.013	1.284	1.827	1.787	1.787

	Q13	Q14	Q15	Q16	Q17
Q13	1.667				
Q14	1.400	1.431			
Q15	1.433	1.400	1.483		
Q16	1.567	1.551	1.483	2.008	
Q17	1.533	1.369	1.267	1.582	1.698

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 23
00:48:38 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

WITHIN CELLS Sum-of-Squares and Cross-Products

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	33.200					
Q08	9.400	27.050				
Q09	14.200	31.650	48.117			
Q10	23.800	23.350	29.550	41.450		
Q11	23.600	19.200	19.600	34.400	38.800	
Q12	26.600	16.200	18.600	32.400	33.800	38.800
Q13	18.000	17.500	22.500	28.500	27.000	27.000
Q14	13.400	13.800	16.733	21.600	24.200	22.200
Q15	14.000	14.750	18.750	22.250	24.000	22.000
Q16	14.800	14.350	16.883	20.450	25.400	25.400
Q17	17.600	15.200	19.267	27.400	26.800	26.800

	Q13	Q14	Q15	Q16	Q17
Q13	25.000				
Q14	21.000	21.467			
Q15	21.500	21.000	22.250		
Q16	23.500	23.267	22.250	30.117	
Q17	23.000	20.533	19.000	23.733	25.467

- -

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES BEFORE SEARCHING Page 24
00:48:38 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

EFFECT .. CLASS
Multivariate Tests of Significance (S = 1, M = 4 1/2, N = 1 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.58314	.63585	11.00	5.00	.753
Hotellings	1.39886	.63585	11.00	5.00	.753
Wilks	.41686	.63585	11.00	5.00	.753
Roys	.58314				

Note.. F statistics are exact.

- -

Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.
1	1.399	100.000	100.000	.764

- -

EFFECT .. CLASS (CONT.)
Univariate F-tests with (1,15) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
Q07	1.27059	33.20000	1.27059	2.21333	.57406	.460
Q08	1.06765	27.05000	1.06765	1.80333	.59204	.454
Q09	2.35392	48.11667	2.35392	3.20778	.73382	.405
Q10	2.55000	41.45000	2.55000	2.76333	.92280	.352
Q11	.14118	38.80000	.14118	2.58667	.05458	.818
Q12	.14118	38.80000	.14118	2.58667	.05458	.818
Q13	.88235	25.00000	.88235	1.66667	.52941	.478
Q14	.06275	21.46667	.06275	1.43111	.04384	.837
Q15	.22059	22.25000	.22059	1.48333	.14871	.705
Q16	.11863	30.11667	.11863	2.00778	.05908	.811
Q17	2.65098	25.46667	2.65098	1.69778	1.56144	.231

- -

EFFECT .. CLASS (CONT.)

>Note # 12188
>Because there are no functions significant at level alpha, MANOVA will not
>report any canonical discriminant or correlation analysis for this effect.

27720 BYTES OF WORKSPACE NEEDED FOR MANOVA EXECUTION.

PRECEDING TASK REQUIRED 2.03 SECONDS CPU TIME; 3.67 SECONDS ELAPSED.

61

61 COMMAND LINES READ.
0 ERRORS DETECTED.
0 WARNINGS ISSUED.
2 SECONDS CPU TIME.
4 SECONDS ELAPSED TIME.
END OF JOB.

Appendix P

MANOVA Student Responses After Searching

```
*********
after.dat
*********
 1  1  2  4  2  2  2  4  4  3  3  3  3  3
 2  1  2  4  5  5  5  5  5  9  5  4  5  5
 3  1  2  3  4  4  4  4  4  3  3  3  4  4
 4  1  2  5  5  5  5  5  5  4  5  4  5  4
 5  1  2  4  3  4  1  3  5  3  4  2  4  4
 6  1  2  5  4  5  4  3  5  5  4  5  5  4
 7  1  2  5  4  4  4  4  5  4  4  4  3  4
 8  1  2  4  3  3  3  4  4  3  3  3  4  3
 9  1  2  3  3  4  3  4  4  3  5  4  4  3
10  1  2  4  5  5  4  4  3  3  5  4  2  5
11  1  2  3  3  4  3  1  1  3  4  4  1  3
12  1  2  3  4  3  3  3  5  3  0  3  4  3
13  1  2  4  3  4  4  3  3  3  2  2  1  1
14  2  2  4  4  5  4  5  5  5  5  5  5  5
15  2  2  2  5  5  2  3  3  2  5  5  5  3
16  2  2  3  2  4  3  4  3  3  4  3  3  3
17  2  2  2  2  3  1  2  1  3  3  3  1  3
18  2  2  3  3  4  5  4  3  3  1  1  0  3


*********
after.r01
*********

SET WIDTH = 80

TITLE = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING

DATA LIST FILE = 'after.dat' FIXED
     / Subject#  01-02
       Class     04
       Occasion  06
       Q07       08
       Q08       10
       Q09       12
       Q10       14
       Q11       16
       Q12       18
       Q13       20
       Q14       22
       Q15       24
```

```
       Q16         26
       Q17         28

VARIABLE LABELS
       Subject#    "Subject #"
       Class       "Class"
       Occasion    "Posttest"
       Q07         "Terminal"
       Q08         "Database Choice"
       Q09         "Subject Terms"
       Q10         "Search Command"
       Q11         "Connectors"
       Q12         "Print Command"
       Q13         "Truncation"
       Q14         "Publ Year"
       Q15         "Language"
       Q16         "Logging Out"
       Q17         "Overall"

VALUE LABELS
       Class       1  'Full Period'
                   2  'Tour'

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q14 (9) Q15 (9) Q16 (9) Q17 (9)

MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
       by Class (1,2)

       / PRINT = CELLINFO        (ALL)
                 HOMOGENEITY     (ALL)
                 DESIGN          (ONEWAY)
                 ERROR           (ALL)
                 SIGNIF          (EIGEN)
       / PLOT =  STEMLEAF
                 BOXPLOTS
       / DISCRIM                 (ALL)
       / DESIGN /



*********
after.o01
*********
124 Mar 91    SPSS-X Release 3.0 for VAX/UNIX                  Page   1
 00:49:00     Nova University                VAX 8550        ULTRIX 2.3
```

For ULTRIX 2.3 Nova University License Number 19439
Trial period from March 1, 1991 for 1 month.

Try the new SPSS-X Release 3.0 features:

* Interactive SPSS-X command execution
* Online Help
* Nonlinear Regression
* Time Series and Forecasting (TRENDS)
* Macro Facility

* Improvements in:
* REPORT
* TABLES
* Simplified Syntax
* Matrix I/O

See SPSS-X Users Guide, Third Edition for more information on these features.

```
  1  0
  2  0  SET WIDTH = 80
  3
  4  TITLE = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING
  5
  6  DATA LIST FILE = 'after.dat' FIXED
  7       / Subject#  01-02
  8         Class     04
  9         Occasion  06
 10         Q07       08
 11         Q08       10
 12         Q09       12
 13         Q10       14
 14         Q11       16
 15         Q12       18
 16         Q13       20
 17         Q14       22
 18         Q15       24
 19         Q16       26
 20         Q17       28
 21
```

THE COMMAND ABOVE READS 1 RECORDS FROM after.dat

VARIABLE	REC	START	END	FORMAT	WIDTH	DEC
SUBJECT#	1	1	2	F	2	0
CLASS	1	4	4	F	1	0
OCCASION	1	6	6	F	1	0
Q07	1	8	8	F	1	0
Q08	1	10	10	F	1	0
Q09	1	12	12	F	1	0
Q10	1	14	14	F	1	0
Q11	1	16	16	F	1	0
Q12	1	18	18	F	1	0
Q13	1	20	20	F	1	0
Q14	1	22	22	F	1	0

```
          Q15          1     24     24          F           1    0
          Q16          1     26     26          F           1    0
          Q17          1     28     28          F           1    0
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING  Page   2
 00:49:01  Nova University                VAX 8550        ULTRIX 2.3


END OF DATALIST TABLE


  22  VARIABLE LABELS
  23         Subject#  "Subject #"
  24         Class     "Class"
  25         Occasion  "Posttest"
  26         Q07       "Terminal"
  27         Q08       "Database Choice"
  28         Q09       "Subject Terms"
  29         Q10       "Search Command"
  30         Q11       "Connectors"
  31         Q12       "Print Command"
  32         Q13       "Truncation"
  33         Q14       "Publ Year"
  34         Q15       "Language"
  35         Q16       "Logging Out"
  36         Q17       "Overall"
  37
  38  VALUE LABELS
  39         Class     1  'Full Period'
  40                   2  'Tour'
  41
  42  MISSING VALUE
  43   Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
  44   Q14 (9) Q15 (9) Q16 (9) Q17 (9)
  45
  46  MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17
  47         by Class (1,2)
  48
  49         / PRINT = CELLINFO       (ALL)
  50                   HOMOGENEITY    (ALL)
  51                   DESIGN         (ONEWAY)
  52                   ERROR          (ALL)
  53                   SIGNIF         (EIGEN)
  54         / PLOT =  STEMLEAF
  55                   BOXPLOTS
  56         / DISCRIM                (ALL)
  57         / DESIGN /
  58
  59
  60
```

124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 3
00:49:02 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E * * * * * *

17 cases accepted.
0 cases rejected because of out-of-range factor values.
3 cases rejected because of missing data.
2 non-empty cells.

1 design will be processed.

- - - -

Variable .. Q11 Connectors

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.500	1.000	12
CLASS	Tour	3.600	1.140	5
For entire sample		3.529	1.007	17

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Means and Standard Deviations (CONT.)

Variable .. Q12 Print Command

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	4.000	1.206	12
CLASS	Tour	3.000	1.414	5
For entire sample		3.706	1.312	17

- -

Variable .. Q13 Truncation

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.333	.651	12
CLASS	Tour	3.200	1.095	5
For entire sample		3.294	.772	17

- -

Variable .. Q14 Publ Year

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.500	1.446	12
CLASS	Tour	3.600	1.673	5
For entire sample		3.529	1.463	17

- -

Variable .. Q15 Language

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.417	.900	12
CLASS	Tour	3.400	1.673	5
For entire sample		3.412	1.121	17

- -

Variable .. Q16 Logging Out

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.333	1.371	12
CLASS	Tour	2.800	2.280	5
For entire sample		3.176	1.629	17

Variable .. Q17 Overall

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.417	.996	12
CLASS	Tour	3.400	.894	5
For entire sample		3.412	.939	17

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Univariate Homogeneity of Variance Tests

Variable .. Q07 Terminal

Cochrans C(8,2) = .52680, P = .883 (approx.)
Bartlett-Box F(1,359) = .01569, P = .900

Variable .. Q08 Database Choice

Cochrans C(8,2) = .67713, P = .315 (approx.)
Bartlett-Box F(1,359) = .81293, P = .368

Variable .. Q09 Subject Terms

Cochrans C(8,2) = .53661, P = .841 (approx.)
Bartlett-Box F(1,359) = .02819, P = .867

Variable .. Q10 Search Command

Cochrans C(8,2) = .68465, P = .294 (approx.)
Bartlett-Box F(1,359) = .89412, P = .345

Variable .. Q11 Connectors

Cochrans C(8,2) = .56522, P = .719 (approx.)
Bartlett-Box F(1,359) = .09597, P = .757

Variable .. Q12 Print Command

Cochrans C(8,2) = .57895, P = .663 (approx.)
Bartlett-Box F(1,359) = .14252, P = .706

Variable .. Q13 Truncation

Cochrans C(8,2) = .73881, P = .163 (approx.)
Bartlett-Box F(1,359) = 1.65174, P = .200

Variable .. Q14 Publ Year

Cochrans C(8,2) = .57249, P = .689 (approx.)
Bartlett-Box F(1,359) = .11940, P = .730

Variable .. Q15 Language

Cochrans C(8,2) = .77549, P = .099 (approx.)
Bartlett-Box F(1,359) = 2.38682, P = .123

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Univariate Homogeneity of Variance Tests (CONT.)

Variable .. Q16 Logging Out

Cochrans C(8,2) = .73459, P = .171 (approx.)
Bartlett-Box F(1,359) = 1.58025, P = .210

Variable .. Q17 Overall

Cochrans C(8,2) = .55368, P = .768 (approx.)
Bartlett-Box F(1,359) = .06017, P = .806

- -

Cell Number .. 1
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	6.917					
Q08	2.583	8.917				
Q09	2.917	6.583	8.917			
Q10	3.333	7.667	6.333	12.667		
Q11	3.500	3.500	.500	4.000	11.000	
Q12	5.000	3.000	.000	.000	8.000	16.000
Q13	4.333	2.667	3.333	3.667	1.000	4.000
Q14	4.500	3.500	8.500	3.000	4.000	-2.000
Q15	2.417	4.083	4.417	5.333	.500	.000
Q16	3.333	3.667	1.333	.667	8.000	15.000
Q17	2.417	6.083	4.417	1.333	3.500	4.000

	Q13	Q14	Q15	Q16	Q17
Q13	4.667				
Q14	3.000	23.000			
Q15	4.333	7.500	8.917		
Q16	4.667	2.000	3.333	20.667	
Q17	2.333	8.500	4.917	6.333	10.917

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.629					
Q08	.235	.811				
Q09	.265	.598	.811			
Q10	.303	.697	.576	1.152		
Q11	.318	.318	.045	.364	1.000	
Q12	.455	.273	.000	.000	.727	1.455
Q13	.394	.242	.303	.333	.091	.364
Q14	.409	.318	.773	.273	.364	-.182
Q15	.220	.371	.402	.485	.045	.000
Q16	.303	.333	.121	.061	.727	1.364

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 1 (CONT.)

Variance-Covariance matrix (CONT.)

	Q07	Q08	Q09	Q10	Q11	Q12
Q17	.220	.553	.402	.121	.318	.364

	Q13	Q14	Q15	Q16	Q17
Q13	.424				
Q14	.273	2.091			
Q15	.394	.682	.811		
Q16	.424	.182	.303	1.879	
Q17	.212	.773	.447	.576	.992

Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.793					
Q08	.329	.900				
Q09	.371	.738	.900			
Q10	.356	.721	.596	1.073		
Q11	.401	.353	.050	.339	1.000	
Q12	.475	.251	.000	.000	.603	1.206

Q13	.763	.413	.517	.477	.140	.463
Q14	.357	.244	.594	.176	.251	-.104
Q15	.308	.458	.495	.502	.050	.000
Q16	.279	.270	.098	.041	.531	.825
Q17	.278	.617	.448	.113	.319	.303

	Q13	Q14	Q15	Q16	Q17
Q13	.651				
Q14	.290	1.446			
Q15	.672	.524	.900		
Q16	.475	.092	.246	1.371	
Q17	.327	.536	.498	.422	.996

Determinant of Variance-Covariance matrix = .00000
LOG(Determinant) = -15.51263

- - - - - - - - - - -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 2
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.800					
Q08	.200	6.800				
Q09	1.200	3.800	2.800			
Q10	4.000	1.000	2.000	10.000		
Q11	3.600	1.400	2.400	6.000	5.200	
Q12	4.000	4.000	4.000	6.000	6.000	8.000
Q13	3.200	-.200	.800	3.000	3.400	4.000
Q14	.600	4.400	3.400	-4.000	1.200	4.000
Q15	.400	5.600	3.600	-4.000	.800	4.000
Q16	1.800	8.200	6.200	-2.000	3.600	8.000
Q17	2.400	1.600	1.600	2.000	2.800	4.000

	Q13	Q14	Q15	Q16	Q17
Q13	4.800				
Q14	1.400	11.200			
Q15	1.600	10.800	11.200		
Q16	2.200	14.600	14.400	20.800	
Q17	3.600	2.800	3.200	4.400	3.200

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.700					
Q08	.050	1.700				
Q09	.300	.950	.700			
Q10	1.000	.250	.500	2.500		
Q11	.900	.350	.600	1.500	1.300	
Q12	1.000	1.000	1.000	1.500	1.500	2.000
Q13	.800	-.050	.200	.750	.850	1.000
Q14	.150	1.100	.850	-1.000	.300	1.000
Q15	.100	1.400	.900	-1.000	.200	1.000
Q16	.450	2.050	1.550	-.500	.900	2.000
Q17	.600	.400	.400	.500	.700	1.000

	Q13	Q14	Q15	Q16	Q17
Q13	1.200				
Q14	.350	2.800			
Q15	.400	2.700	2.800		
Q16	.550	3.650	3.600	5.200	
Q17	.900	.700	.800	1.100	.800

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 2 (CONT.)
Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.837					
Q08	.046	1.304				
Q09	.429	.871	.837			
Q10	.756	.121	.378	1.581		
Q11	.943	.235	.629	.832	1.140	
Q12	.845	.542	.845	.671	.930	1.414
Q13	.873	-.035	.218	.433	.681	.645
Q14	.107	.504	.607	-.378	.157	.423
Q15	.071	.642	.643	-.378	.105	.423
Q16	.236	.689	.812	-.139	.346	.620
Q17	.802	.343	.535	.354	.686	.791

	Q13	Q14	Q15	Q16	Q17
Q13	1.095				
Q14	.191	1.673			
Q15	.218	.964	1.673		
Q16	.220	.957	.943	2.280	
Q17	.919	.468	.535	.539	.894

>Note # 12171
>Singular variance-covariance matrix for this cell.

Pooled within-cells Variance-Covariance matrix (non-singular cells)

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.629					
Q08	.235	.811				
Q09	.265	.598	.811			
Q10	.303	.697	.576	1.152		
Q11	.318	.318	.045	.364	1.000	
Q12	.455	.273	.000	.000	.727	1.455
Q13	.394	.242	.303	.333	.091	.364
Q14	.409	.318	.773	.273	.364	-.182
Q15	.220	.371	.402	.485	.045	.000
Q16	.303	.333	.121	.061	.727	1.364
Q17	.220	.553	.402	.121	.318	.364

	Q13	Q14	Q15	Q16	Q17
Q13	.424				
Q14	.273	2.091			
Q15	.394	.682	.811		
Q16	.424	.182	.303	1.879	
Q17	.212	.773	.447	.576	.992

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

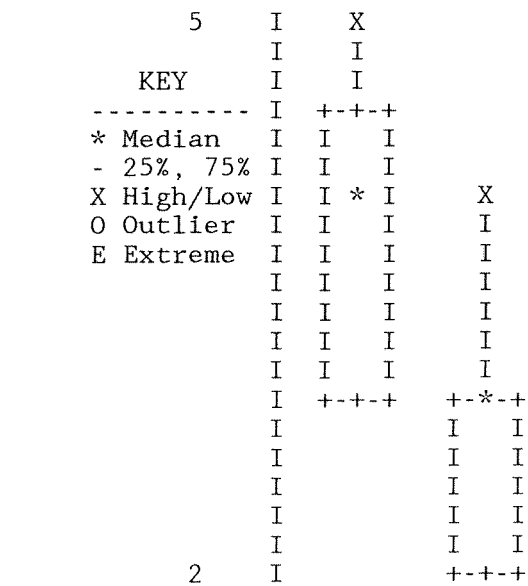
0 cells with only one observation.
1 cell with singular Variance-Covariance matrix.

Boxs M-test cannot be performed.

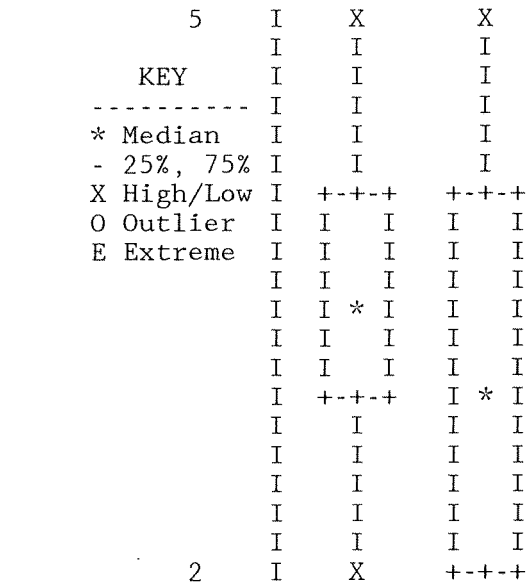
- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Box-Plots For Variable .. Q07 Terminal



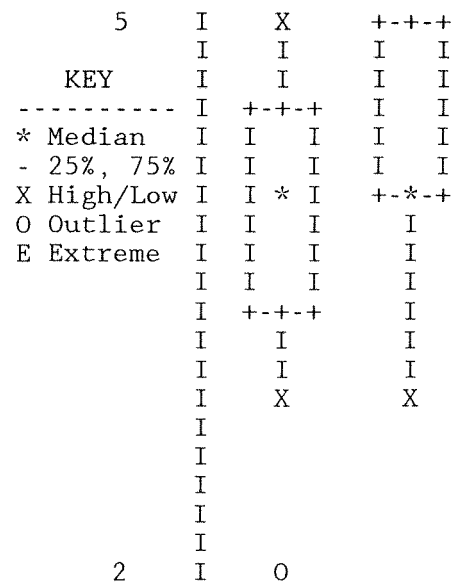
Box-Plots For Variable .. Q08 Database Choice



124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 12
00:49:03 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

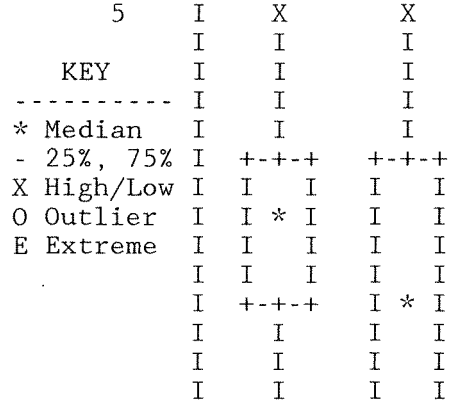
Box-Plots For Variable .. Q09 Subject Terms

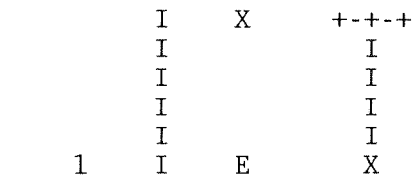


Variable----------
CLASS 1 2

- -

Box-Plots For Variable .. Q10 Search Command

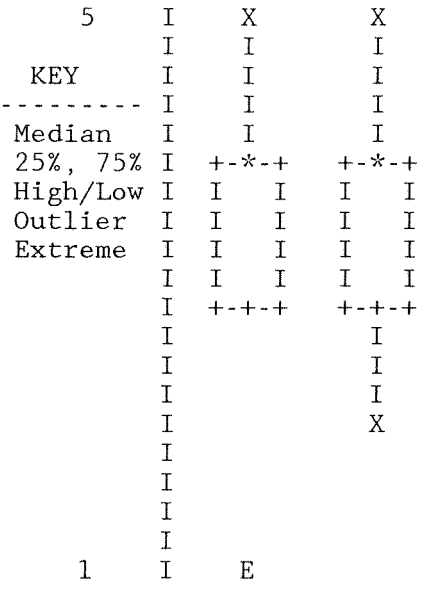




Variable----------
CLASS 1 2

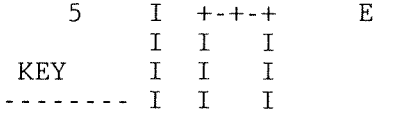
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

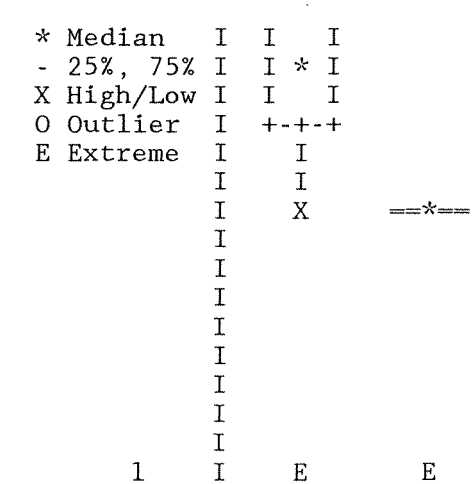
Box-Plots For Variable .. Q11 Connectors



Variable----------
CLASS 1 2

Box-Plots For Variable .. Q12 Print Command



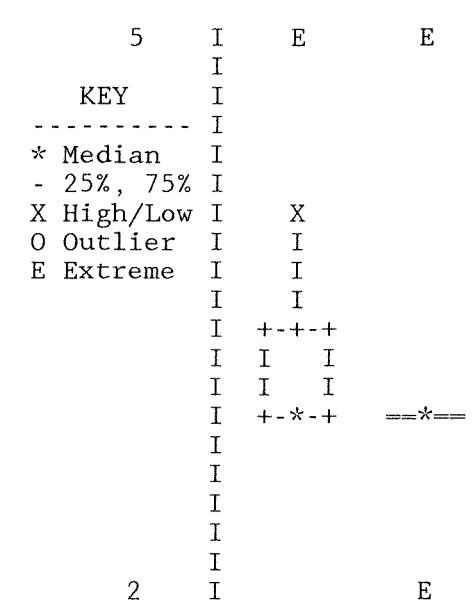


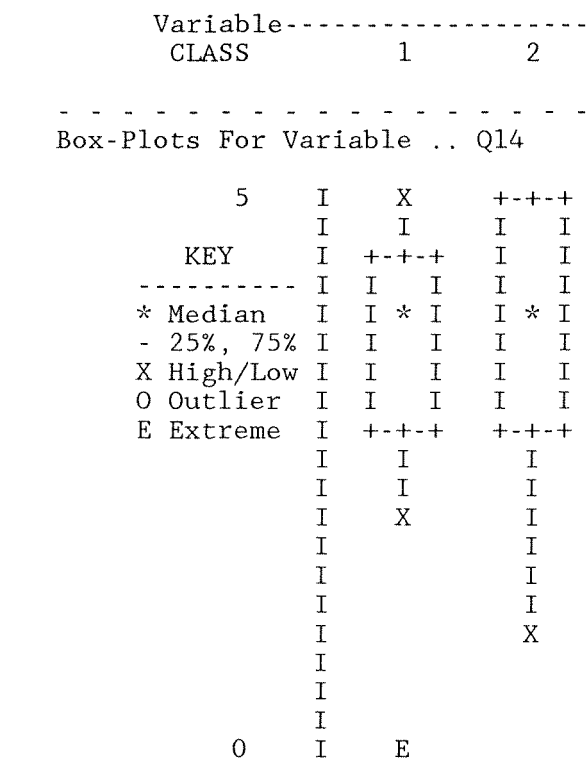
Variable----------

CLASS	1	2

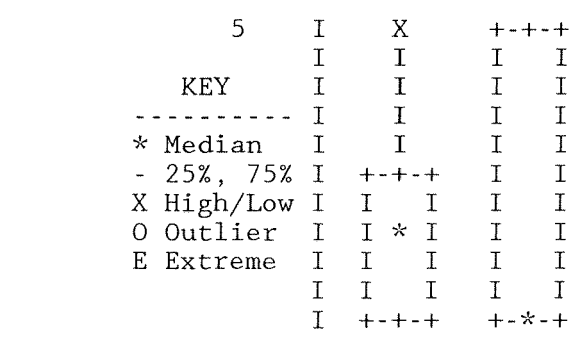
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

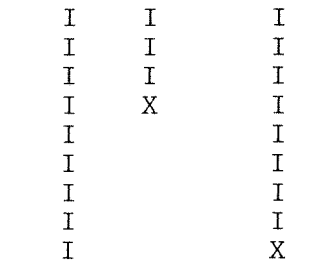
Box-Plots For Variable .. Q13 Truncation



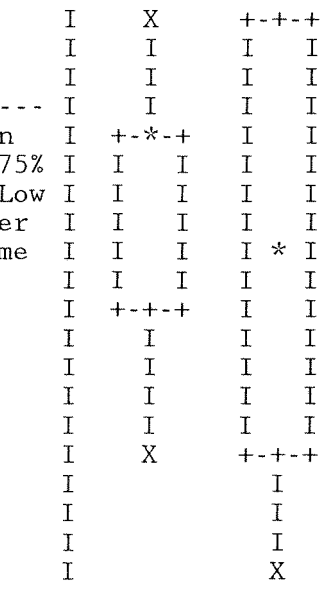


* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *



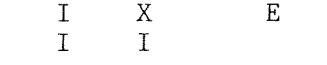


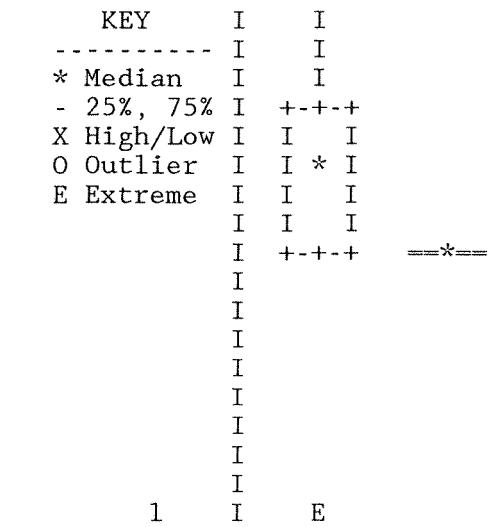
```
                I    I       I
                I    I       I
                I    I       I
                I    X       I
                I            I
                I            I
                I            I
                I            I
           1    I            X

      Variable-------------------------------------------------------
       CLASS         1       2

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Box-Plots For Variable .. Q16          Logging Out

           5    I    X     +-+-+
                I    I     I   I
        KEY     I    I     I   I
     ---------- I    I     I   I
     * Median   I  +-*-+   I   I
     - 25%, 75% I  I   I   I   I
     X High/Low I  I   I   I   I
     O Outlier  I  I   I   I   I
     E Extreme  I  I   I   I * I
                I  I   I   I   I
                I  +-+-+   I   I
                I    I     I   I
                I    I     I   I
                I    I     I   I
                I    I     I   I
                I    X     +-+-+
                I            I
                I            I
                I            I
           0    I            X

      Variable-------------------------------------------------------
       CLASS         1       2
```



124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING Page 16
00:49:03 Nova University VAX 8550 ULTRIX 2.3

```
* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

 Box-Plots For Variable .. Q17          Overall

           5    I    X       E
                I    I
```





Variable----------
CLASS 1 2

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q07 Terminal

```
2 . 00
3 . 000000
4 . 000000
5 . 000
```

Stem-and-leaf display for variable .. Q08 Database Choice

```
2 . 000
3 . 000000
4 . 00000
5 . 000
```

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q09 Subject Terms

```
    2 . 0
    3 . 000
    4 . 00000000
    5 . 00000
```

- -

Stem-and-leaf display for variable .. Q10 Search Command

```
    1 . 00
    2 . 00
    3 . 00000
    4 . 000000
    5 . 00
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q11 Connectors

```
    1 . 0
    2 . 0
    3 . 00000
    4 . 00000000
    5 . 00
```

- -

Stem-and-leaf display for variable .. Q12 Print Command

```
    1 . 00
    2 .
    3 . 00000
    4 . 0000
    5 . 000000
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q13 Truncation

```
    2 . 0
    3 . 000000000000
    4 . 00
    5 . 00
```

- -

Stem-and-leaf display for variable .. Q14 Publ Year

```
    0 . 00
    2 . 00000
    4 . 0000000000
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q15 Language

```
    1 . 0
    2 . 00
    3 . 000000
    4 . 00000
    5 . 000
```

- -

Stem-and-leaf display for variable .. Q16 Logging Out

```
    0 . 0000
    2 . 0000
    4 . 000000000
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q17 Overall

```
    1 . 0
    2 .
    3 . 000000000
    4 . 00000
    5 . 00
```

One-way Basis for factor CLASS

	1	2
1	1.000	1.000
2	1.000	-1.000

Partition	DF	Columns
1	1	2

Correspondence between Effects and Columns of BETWEEN-Subjects DESIGN 1

Starting Column	Ending Column	Effect Name
1	1	CONSTANT
2	2	CLASS

WITHIN CELLS Correlations with Std. Devs. on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.805					
Q08	.225	1.024				
Q09	.386	.765	.884			
Q10	.494	.459	.511	1.229		
Q11	.566	.307	.210	.522	1.039	
Q12	.589	.360	.239	.257	.710	1.265
Q13	.785	.202	.392	.455	.355	.531
Q14	.280	.341	.594	-.036	.221	.070
Q15	.201	.545	.522	.062	.072	.182
Q16	.256	.465	.342	-.043	.448	.729
Q17	.411	.516	.468	.186	.417	.435

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

WITHIN CELLS Correlations with Std. Devs. on Diagonal (CONT.)

	Q13	Q14	Q15	Q16	Q17
Q13	.794				
Q14	.245	1.510			

Q15	.430	.698	1.158		
Q16	.347	.441	.614	1.663	
Q17	.513	.514	.482	.444	.970

- -

Statistics for WITHIN CELLS correlations

Log(Determinant) = -12.04664
Bartlett test of sphericity = 126.48976 with 55 D. F.
Significance = .000

F(max) criterion = 4.38028 with (11,15) D. F.

- -

WITHIN CELLS Variances and Covariances

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.648					
Q08	.186	1.048				
Q09	.274	.692	.781			
Q10	.489	.578	.556	1.511		
Q11	.473	.327	.193	.667	1.080	
Q12	.600	.467	.267	.400	.933	1.600
Q13	.502	.164	.276	.444	.293	.533
Q14	.340	.527	.793	-.067	.347	.133
Q15	.188	.646	.534	.089	.087	.267
Q16	.342	.791	.502	-.089	.773	1.533
Q17	.321	.512	.401	.222	.420	.533

	Q13	Q14	Q15	Q16	Q17
Q13	.631				
Q14	.293	2.280			
Q15	.396	1.220	1.341		
Q16	.458	1.107	1.182	2.764	
Q17	.396	.753	.541	.716	.941

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

WITHIN CELLS Sum-of-Squares and Cross-Products

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	9.717					
Q08	2.783	15.717				
Q09	4.117	10.383	11.717			
Q10	7.333	8.667	8.333	22.667		
Q11	7.100	4.900	2.900	10.000	16.200	
Q12	9.000	7.000	4.000	6.000	14.000	24.000
Q13	7.533	2.467	4.133	6.667	4.400	8.000
Q14	5.100	7.900	11.900	-1.000	5.200	2.000
Q15	2.817	9.683	8.017	1.333	1.300	4.000
Q16	5.133	11.867	7.533	-1.333	11.600	23.000
Q17	4.817	7.683	6.017	3.333	6.300	8.000

	Q13	Q14	Q15	Q16	Q17
Q13	9.467				
Q14	4.400	34.200			
Q15	5.933	18.300	20.117		
Q16	6.867	16.600	17.733	41.467	
Q17	5.933	11.300	8.117	10.733	14.117

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

EFFECT .. CLASS
Multivariate Tests of Significance (S = 1, M = 4 1/2, N = 1 1/2)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.83939	2.37554	11.00	5.00	.175
Hotellings	5.22619	2.37554	11.00	5.00	.175
Wilks	.16061	2.37554	11.00	5.00	.175
Roys	.83939				

Note.. F statistics are exact.

- -

Eigenvalues and Canonical Correlations

Root No.	Eigenvalue	Pct.	Cum. Pct.	Canon Cor.
1	5.226	100.000	100.000	.916

- -

EFFECT .. CLASS (CONT.)
Univariate F-tests with (1,15) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
Q07	4.40098	9.71667	4.40098	.64778	6.79397	.020
Q08	.51863	15.71667	.51863	1.04778	.49498	.492
Q09	.28333	11.71667	.28333	.78111	.36273	.556
Q10	.39216	22.66667	.39216	1.51111	.25952	.618
Q11	.03529	16.20000	.03529	1.08000	.03268	.859
Q12	3.52941	24.00000	3.52941	1.60000	2.20588	.158
Q13	.06275	9.46667	.06275	.63111	.09942	.757
Q14	.03529	34.20000	.03529	2.28000	.01548	.903
Q15	.00098	20.11667	.00098	1.34111	.00073	.979
Q16	1.00392	41.46667	1.00392	2.76444	.36315	.556
Q17	.00098	14.11667	.00098	.94111	.00104	.975

- -

EFFECT .. CLASS (CONT.)
Raw discriminant function coefficients

	Function No.
Variable	1
Q07	-.880
Q08	-1.146
Q09	3.606
Q10	-2.112
Q11	3.124
Q12	-1.440
Q13	1.036
Q14	-1.894

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

EFFECT .. CLASS (CONT.)
Raw discriminant function coefficients (CONT.)

	Function No.
Variable	1
Q15	1.163
Q16	-.298
Q17	-.057

- -

Standardized discriminant function coefficients

	Function No.
Variable	1
Q07	-.708
Q08	-1.173
Q09	3.187
Q10	-2.597
Q11	3.246
Q12	-1.821
Q13	.823
Q14	-2.859
Q15	1.346
Q16	-.496
Q17	-.056

- -

Estimates of effects for canonical variables

	Canonical Variable
Parameter	1
2	-2.356

- -

Correlations between DEPENDENT and canonical variables

	Canonical Variable
Variable	1
Q07	-.294
Q08	-.079
Q09	.068
Q10	-.058
Q11	.020
Q12	-.168
Q13	-.036
Q14	.014
Q15	-.003
Q16	-.068

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

```
  EFFECT .. CLASS (CONT.)
  Correlations between DEPENDENT and canonical variables (CONT.)
            Canonical Variable
  Variable             1

  Q17              -.004

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   27720 BYTES OF WORKSPACE NEEDED FOR MANOVA EXECUTION.
124 Mar 91 = DIALOG QUESTIONNAIRE RESPONSES AFTER SEARCHING   Page 28
 00:49:04  Nova University                VAX 8550         ULTRIX 2.3


PRECEDING TASK REQUIRED  2.00 SECONDS CPU TIME;  2.46 SECONDS ELAPSED.

   61

     61 COMMAND LINES READ.
      0 ERRORS DETECTED.
      0 WARNINGS ISSUED.
      2 SECONDS CPU TIME.
      3 SECONDS ELAPSED TIME.
        END OF JOB.
```

Appendix Q

MANOVA on Performance Indicators

```
**********
during.dat
**********
 1  1  3  5  2  3  4  3  3  4  4  9  5  4
 2  1  3  4  5  4  5  4  5  9  4  4  4  4
 3  1  3  4  5  5  5  4  5  5  9  9  5  4
 4  1  3  5  4  2  2  3  2  9  9  9  4  3
 5  1  3  4  4  4  4  4  4  9  9  5  3  4
 6  1  3  3  4  4  3  3  4  4  9  9  4  4
 7  1  3  4  4  4  5  4  4  5  9  9  4  4
 8  1  3  4  4  4  4  4  4  9  9  9  4  4
 9  1  3  4  4  4  4  4  4  9  4  5  4  4
10  1  3  4  5  5  4  4  5  4  4  9  5  4
11  1  3  3  2  2  2  2  2  2  2  2  2  2
12  1  3  3  4  4  3  4  4  5  9  9  3  4
13  1  3  4  5  5  5  4  5  4  5  9  3  4
14  2  3  5  3  4  3  3  2  9  3  9  1  3
15  2  3  3  5  5  4  5  5  9  9  9  3  4
16  2  3  3  4  4  3  3  3  3  9  9  3  3
17  2  3  5  4  4  3  3  3  1  4  9  4  4
18  2  3  4  3  4  4  4  4  9  9  9  4  4

**********
during.r01
**********

SET WIDTH = 80

TITLE = PERFORMANCE INDICATORS DURING SEARCHING

DATA LIST FILE = 'during.dat' FIXED
     / Subject#  01-02
       Class       04
       Occasion    06
       Q07         08
       Q08         10
       Q09         12
       Q10         14
       Q11         16
       Q12         18
       Q13         20


       Q16         26
       Q17         28
```

```
VARIABLE LABELS
       Subject#  "Subject #"
       Class     "Class"
       Occasion  "During"
       Q07       "Terminal"
       Q08       "Database Choice"
       Q09       "Subject Terms"
       Q10       "Search Command"
       Q11       "Connectors"
       Q12       "Print Command"
       Q13       "Truncation"


       Q16       "Logging Out"
       Q17       "Overall"

VALUE LABELS
       Class     1  'Full Period'
                 2  'Tour'

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q16 (9) Q17 (9)

MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q16 Q17
       by Class (1,2)

       / PRINT = CELLINFO       (ALL)
                 HOMOGENEITY    (ALL)
                 DESIGN         (ONEWAY)
                 ERROR          (ALL)
                 SIGNIF         (EIGEN)
       / PLOT =  STEMLEAF
                 BOXPLOTS
       / DISCRIM                (ALL)
       / DESIGN /

**********
during.o01
**********
124 Mar 91   SPSS-X Release 3.0 for VAX/UNIX                  Page   1
 08:40:40    Nova University                VAX 8550       ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 Trial period from March 1, 1991 for 1 month.

 Try the new SPSS-X Release 3.0 features:

 * Interactive SPSS-X command execution          * Improvements in:
```

```
* Online Help                                    *   REPORT
* Nonlinear Regression                           *   TABLES
* Time Series and Forecasting (TRENDS)           *   Simplified Syntax
* Macro Facility                                 *   Matrix I/O

See SPSS-X Users Guide, Third Edition for more information on these features.

   1  0
   2  0  SET WIDTH = 80
   3
   4  TITLE = PERFORMANCE INDICATORS DURING SEARCHING
   5
   6  DATA LIST FILE = 'during.dat' FIXED
   7       / Subject#  01-02
   8         Class        04
   9         Occasion     06
  10         Q07          08
  11         Q08          10
  12         Q09          12
  13         Q10          14
  14         Q11          16
  15         Q12          18
  16         Q13          20
  17
  18
  19         Q16          26
  20         Q17          28
  21

THE COMMAND ABOVE READS   1 RECORDS FROM during.dat

          VARIABLE   REC  START    END         FORMAT  WIDTH  DEC

          SUBJECT#     1      1      2          F           2    0
          CLASS        1      4      4          F           1    0
          OCCASION     1      6      6          F           1    0
          Q07          1      8      8          F           1    0
          Q08          1     10     10          F           1    0
          Q09          1     12     12          F           1    0
          Q10          1     14     14          F           1    0
          Q11          1     16     16          F           1    0
          Q12          1     18     18          F           1    0
          Q13          1     20     20          F           1    0
          Q16          1     26     26          F           1    0
          Q17          1     28     28          F           1    0

END OF DATALIST TABLE


  22  VARIABLE LABELS
```

```
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page   2
 08:40:41  Nova University                  VAX 8550         ULTRIX 2.3

   23         Subject#  "Subject #"
   24         Class     "Class"
   25         Occasion  "During"
   26         Q07       "Terminal"
   27         Q08       "Database Choice"
   28         Q09       "Subject Terms"
   29         Q10       "Search Command"
   30         Q11       "Connectors"
   31         Q12       "Print Command"
   32         Q13       "Truncation"
   33
   34
   35         Q16       "Logging Out"
   36         Q17       "Overall"
   37
   38  VALUE LABELS
   39         Class     1  'Full Period'
   40                   2  'Tour'
   41
   42  MISSING VALUE
   43   Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
   44   Q16 (9) Q17 (9)
   45
   46  MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q16 Q17
   47         by Class (1,2)
   48
   49         / PRINT = CELLINFO       (ALL)
   50                   HOMOGENEITY    (ALL)
   51                   DESIGN         (ONEWAY)
   52                   ERROR          (ALL)
   53                   SIGNIF         (EIGEN)
   54         / PLOT =  STEMLEAF
   55                   BOXPLOTS
   56         / DISCRIM                (ALL)
   57         / DESIGN /
   58
   59
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page   3
 08:40:42  Nova University                  VAX 8550         ULTRIX 2.3


* * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * *
```

```
       10 cases accepted.
        0 cases rejected because of out-of-range factor values.
        9 cases rejected because of missing data.
        2 non-empty cells.

        1 design will be processed.
```

- - - -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 4
08:40:43 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Means and Standard Deviations (CONT.)

Variable .. Q12 Print Command

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	4.000	1.069	8
CLASS	Tour	3.000	.000	2
For entire sample		3.800	1.033	10

Variable .. Q13 Truncation

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	4.125	.991	8
CLASS	Tour	2.000	1.414	2
For entire sample		3.700	1.337	10

Variable .. Q16 Logging Out

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.875	1.126	8
CLASS	Tour	3.500	.707	2
For entire sample		3.800	1.033	10

Variable .. Q17 Overall

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.750	.707	8
CLASS	Tour	3.500	.707	2
For entire sample		3.700	.675	10

Univariate Homogeneity of Variance Tests

Variable .. Q07 Terminal

Cochrans C(4,2) = .80000, P = .208 (approx.)
Bartlett-Box F(1,26) = .88554, P = .355

Variable .. Q08 Database Choice

Cochrans C(4,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 5
08:40:43 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Univariate Homogeneity of Variance Tests (CONT.)

Variable .. Q09 Subject Terms

Cochrans C(4,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q10 Search Command

Cochrans C(4,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q11 Connectors

Cochrans C(4,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q12 Print Command

Cochrans C(4,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q13 Truncation

Cochrans C(4,2) = .67066, P = .508 (approx.)
Bartlett-Box F(1,26) = .19567, P = .662

Variable .. Q16 Logging Out

Cochrans C(4,2) = .71717, P = .389 (approx.)
Bartlett-Box F(1,26) = .22365, P = .640

Variable .. Q17 Overall

Cochrans C(4,2) = .50000, P = 1.000 (approx.)
Bartlett-Box F(1,26) = .00000, P = 1.000

- - - -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 6
08:40:43 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 1
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	3.500					
Q08	-.250	10.875				
Q09	1.000	9.000	8.000			
Q10	3.750	5.875	6.000	8.875		
Q11	1.000	5.500	5.000	4.500	4.000	
Q12	1.000	9.000	8.000	6.000	5.000	8.000
Q13	1.250	5.125	5.000	5.125	4.500	5.000
Q16	3.750	2.875	4.000	4.875	2.500	4.000
Q17	1.500	3.750	4.000	3.750	3.000	4.000

	Q13	Q16	Q17
Q13	6.875		
Q16	4.125	8.875	
Q17	4.250	3.750	3.500

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.500					
Q08	-.036	1.554				
Q09	.143	1.286	1.143			
Q10	.536	.839	.857	1.268		
Q11	.143	.786	.714	.643	.571	
Q12	.143	1.286	1.143	.857	.714	1.143
Q13	.179	.732	.714	.732	.643	.714
Q16	.536	.411	.571	.696	.357	.571
Q17	.214	.536	.571	.536	.429	.571

	Q13	Q16	Q17
Q13	.982		
Q16	.589	1.268	
Q17	.607	.536	.500

Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12

Q07	.707					
Q08	-.041	1.246				
Q09	.189	.965	1.069			
Q10	.673	.598	.712	1.126		
Q11	.267	.834	.884	.755	.756	
Q12	.189	.965	1.000	.712	.884	1.069
Q13	.255	.593	.674	.656	.858	.674
Q16	.673	.293	.475	.549	.420	.475

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 1 (CONT.)
Correlation matrix with Standard Deviations on Diagonal (CONT.)

	Q07	Q08	Q09	Q10	Q11	Q12
Q17	.429	.608	.756	.673	.802	.756

	Q13	Q16	Q17
Q13	.991		
Q16	.528	1.126	
Q17	.866	.673	.707

>Note # 12171
>Singular variance-covariance matrix for this cell.

Cell Number .. 2
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.000					
Q08	.000	.000				
Q09	.000	.000	.000			
Q10	.000	.000	.000	.000		
Q11	.000	.000	.000	.000	.000	
Q12	.000	.000	.000	.000	.000	.000
Q13	-2.000	.000	.000	.000	.000	.000
Q16	1.000	.000	.000	.000	.000	.000
Q17	1.000	.000	.000	.000	.000	.000

	Q13	Q16	Q17
Q13	2.000		
Q16	-1.000	.500	
Q17	-1.000	.500	.500

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.000					
Q08	.000	.000				
Q09	.000	.000	.000			
Q10	.000	.000	.000	.000		
Q11	.000	.000	.000	.000	.000	
Q12	.000	.000	.000	.000	.000	.000
Q13	-2.000	.000	.000	.000	.000	.000
Q16	1.000	.000	.000	.000	.000	.000
Q17	1.000	.000	.000	.000	.000	.000

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 2 (CONT.)
Variance-Covariance matrix (CONT.)

	Q13	Q16	Q17
Q13	2.000		
Q16	-1.000	.500	
Q17	-1.000	.500	.500

Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	1.414					
Q08	.000	.000				
Q09	.000	.000	.000			
Q10	.000	.000	.000	.000		
Q11	.000	.000	.000	.000	.000	
Q12	.000	.000	.000	.000	.000	.000
Q13	-1.000	.000	.000	.000	.000	.000
Q16	1.000	.000	.000	.000	.000	.000
Q17	1.000	.000	.000	.000	.000	.000

	Q13	Q16	Q17
Q13	1.414		
Q16	-1.000	.707	
Q17	-1.000	1.000	.707

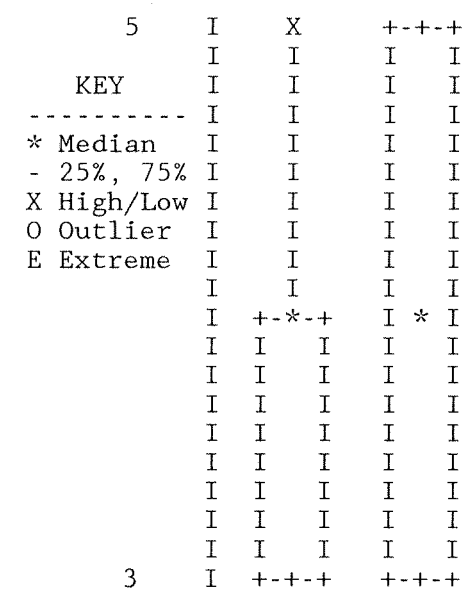
>Note # 12171
>Singular variance-covariance matrix for this cell.

>Note # 12172
>Singular variance-covariance matrix for all cells.

Boxs M-test cannot be performed.

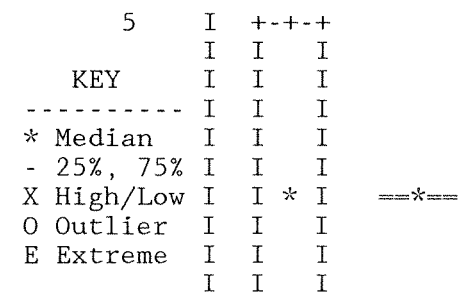
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

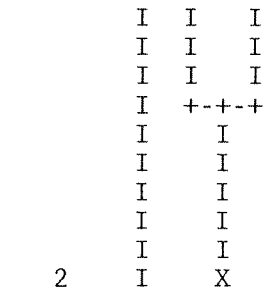
Box-Plots For Variable .. Q07 Terminal



Variable----------
CLASS 1 2

Box-Plots For Variable .. Q08 Database Choice

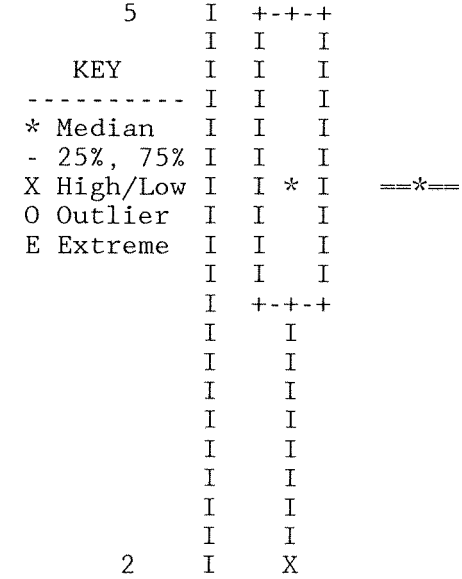




Variable----------
CLASS 1 2

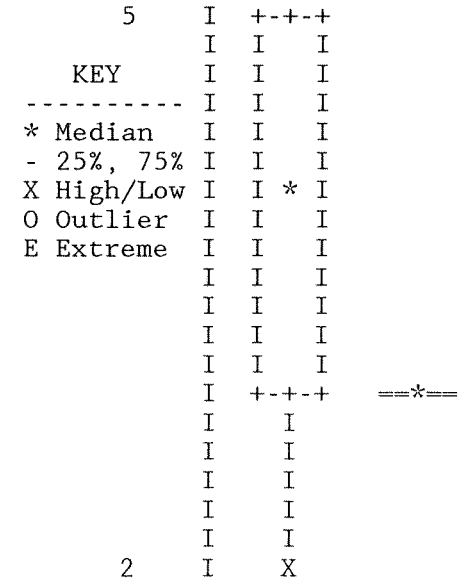
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Box-Plots For Variable .. Q09 Subject Terms



Variable----------
CLASS 1 2

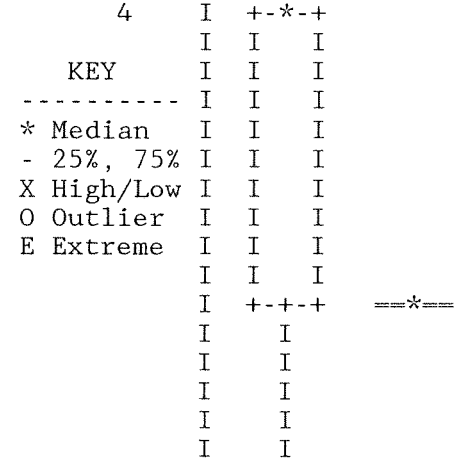
Box-Plots For Variable .. Q10 Search Command

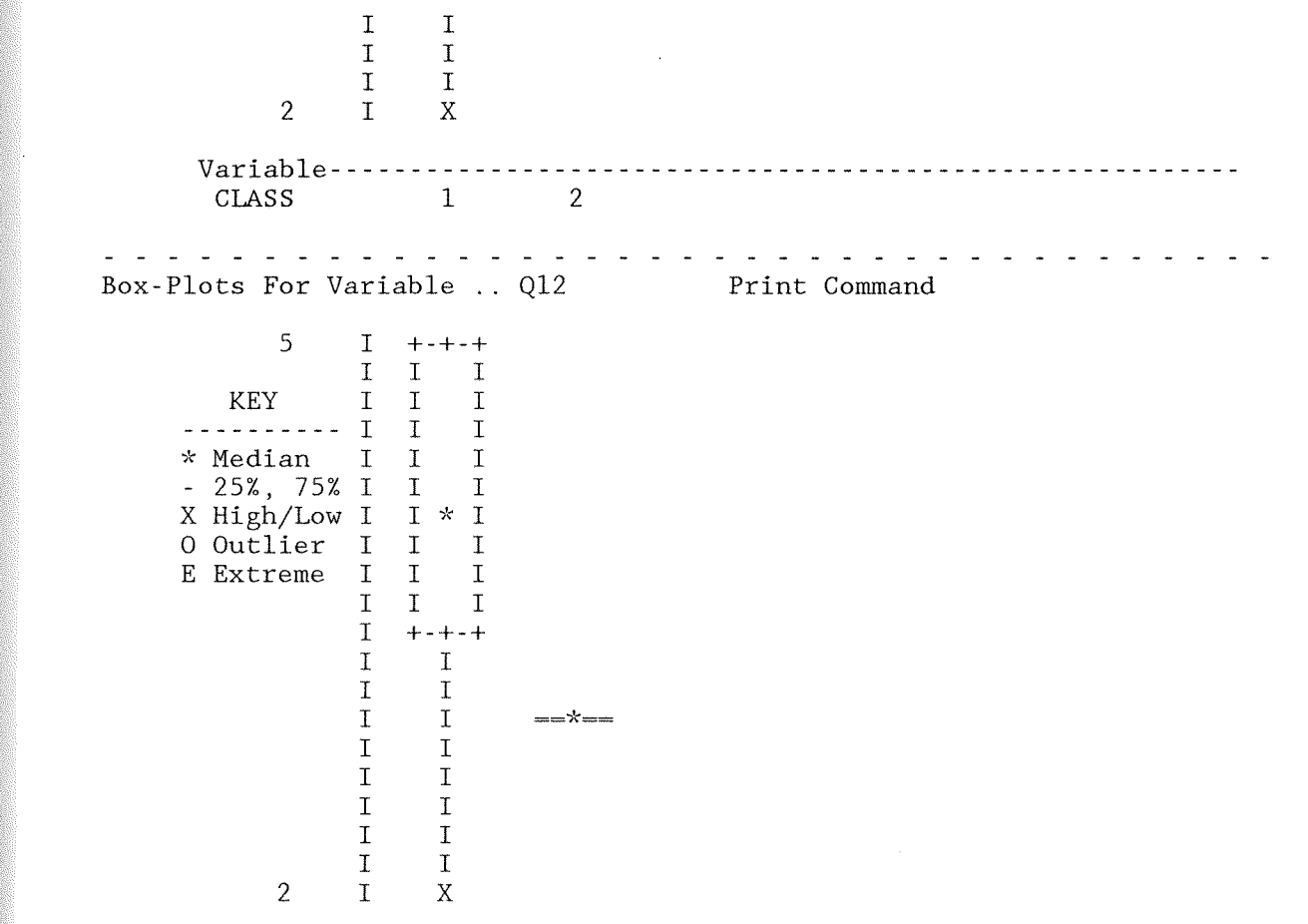


Variable----------
CLASS 1 2

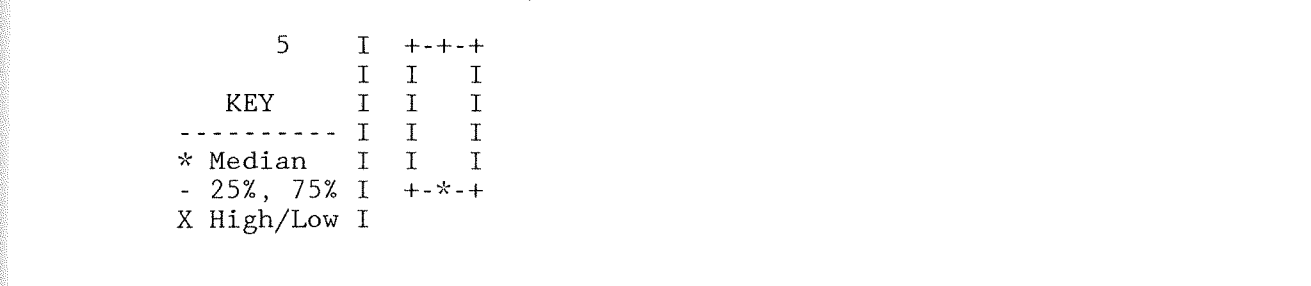
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

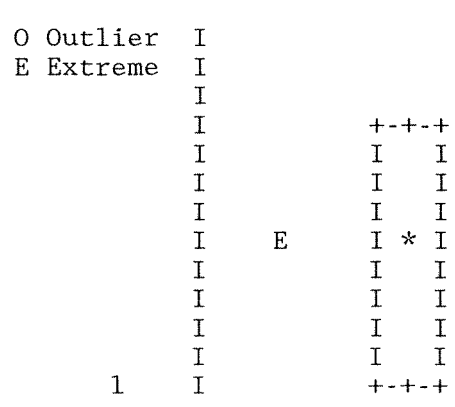
Box-Plots For Variable .. Q11 Connectors





* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

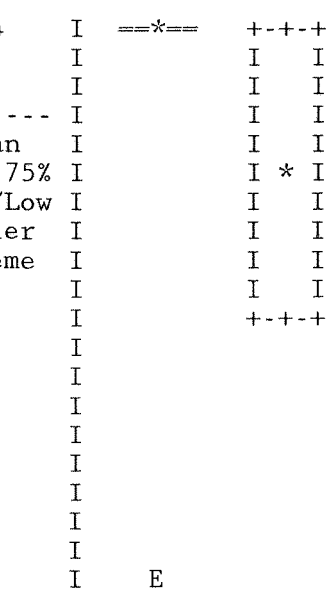




Variable----------
CLASS 1 2

- - - -

Box-Plots For Variable .. Q17 Overall



Variable----------
CLASS 1 2

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q07 Terminal

```
3 . 0000
3 .
4 . 0000
4 .
5 . 00
```

Stem-and-leaf display for variable .. Q08 Database Choice

```
2 . 00
3 .
4 . 00000
5 . 000
```

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 15
08:40:44 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q09 Subject Terms

```
2 . 0
3 . 0
4 . 00000
5 . 000
```

- -

Stem-and-leaf display for variable .. Q10 Search Command

```
2 . 0
3 . 0000
4 . 00
5 . 000
```

- -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 16
08:40:44 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q11 Connectors

```
2 . 0
2 .
3 . 0000
3 .
4 . 00000
```

- -

Stem-and-leaf display for variable .. Q12 Print Command

```
2 . 0
3 . 000
4 . 000
5 . 000
```

- -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 17
08:40:44 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q13 Truncation

```
    1 . 0
    2 . 0
    3 . 0
    4 . 0000
    5 . 000
```

- -

Stem-and-leaf display for variable .. Q16 Logging Out

```
    2 . 0
    3 . 000
    4 . 000
    5 . 000
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q17 Overall

```
    2 . 0
    2 .
    3 . 0
    3 .
    4 . 00000000
```

- -

One-way Basis for factor CLASS

	1	2
1	1.000	1.000
2	1.000	-1.000

Partition	DF	Columns
1	1	2

- -

Correspondence between Effects and Columns of BETWEEN-Subjects DESIGN 1

```
 Starting  Ending
  Column   Column   Effect Name

     1        1     CONSTANT
     2        2     CLASS

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                   *                                                   *
*   W A R N I N G   *  Too few degrees of freedom in WITHIN CELLS        *
*                   *  error term (DF = 8).                              *
*                   *                                                   *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
WITHIN CELLS Correlations with Std. Devs. on Diagonal

                  Q07        Q08        Q09        Q10        Q11        Q12

Q07              .829
Q08             -.032      1.166
Q09              .151       .965      1.000
Q10              .537       .598       .712      1.053
Q11              .213       .834       .884       .755       .707
Q12              .151       .965      1.000       .712       .884      1.000
Q13             -.107       .522       .593       .577       .755       .593
Q16              .661       .285       .462       .534       .408       .462
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page 19
 08:40:44  Nova University                VAX 8550        ULTRIX 2.3

* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

WITHIN CELLS Correlations with Std. Devs. on Diagonal (CONT.)
                  Q07        Q08        Q09        Q10        Q11        Q12

Q17              .533       .569       .707       .629       .750       .707

                  Q13        Q16        Q17

Q13             1.053
Q16              .343      1.083
Q17              .545       .694       .707

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

Statistics for WITHIN CELLS correlations

Log(Determinant) =                .00000
Bartlett test of sphericity =     .      with 36 D. F.
Significance =                      .
```

F(max) criterion = 2.71875 with (9,8) D. F.

- -

WITHIN CELLS Variances and Covariances

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.688					
Q08	-.031	1.359				
Q09	.125	1.125	1.000			
Q10	.469	.734	.750	1.109		
Q11	.125	.688	.625	.562	.500	
Q12	.125	1.125	1.000	.750	.625	1.000
Q13	-.094	.641	.625	.641	.562	.625
Q16	.594	.359	.500	.609	.312	.500
Q17	.313	.469	.500	.469	.375	.500

	Q13	Q16	Q17
Q13	1.109		
Q16	.391	1.172	
Q17	.406	.531	.500

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

WITHIN CELLS Sum-of-Squares and Cross-Products

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	5.500					
Q08	-.250	10.875				
Q09	1.000	9.000	8.000			
Q10	3.750	5.875	6.000	8.875		
Q11	1.000	5.500	5.000	4.500	4.000	
Q12	1.000	9.000	8.000	6.000	5.000	8.000
Q13	-.750	5.125	5.000	5.125	4.500	5.000
Q16	4.750	2.875	4.000	4.875	2.500	4.000
Q17	2.500	3.750	4.000	3.750	3.000	4.000

	Q13	Q16	Q17
Q13	8.875		
Q16	3.125	9.375	
Q17	3.250	4.250	4.000

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                    *                                                    *
*   W A R N I N G    * The WITHIN CELLS error matrix is SINGULAR.         *
*                    * These variables are LINEARLY DEPENDENT             *
*                    * on preceding ones ..                               *
*                    *   Q12                                              *
*                    * Multivariate tests will be skipped.                *
*                    *                                                    *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```


* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

EFFECT .. CLASS
Univariate F-tests with (1,8) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
Q07	.10000	5.50000	.10000	.68750	.14545	.713
Q08	.02500	10.87500	.02500	1.35938	.01839	.895
Q09	.00000	8.00000	.00000	1.00000	.00000	1.000
Q10	1.22500	8.87500	1.22500	1.10938	1.10423	.324
Q11	.40000	4.00000	.40000	.50000	.80000	.397
Q12	1.60000	8.00000	1.60000	1.00000	1.60000	.242
Q13	7.22500	8.87500	7.22500	1.10938	6.51268	.034
Q16	.22500	9.37500	.22500	1.17187	.19200	.673
Q17	.10000	4.00000	.10000	.50000	.20000	.667

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

22192 BYTES OF WORKSPACE NEEDED FOR MANOVA EXECUTION.

PRECEDING TASK REQUIRED 1.70 SECONDS CPU TIME; 3.69 SECONDS ELAPSED.

```
60

   60 COMMAND LINES READ.
    0 ERRORS DETECTED.
    0 WARNINGS ISSUED.
    2 SECONDS CPU TIME.
    5 SECONDS ELAPSED TIME.
      END OF JOB.
```

Appendix R

MANOVA on Restricted Performance Indicators

```
***********
during.dat2
***********
 1 1 3 5 2 3 4 3 3 4 4 9 5 4
 4 1 3 5 4 2 2 3 2 9 9 9 4 3
 5 1 3 4 4 4 4 4 4 9 9 5 3 4
 6 1 3 3 4 4 3 3 4 4 9 9 4 4
 8 1 3 4 4 4 4 4 4 9 9 9 4 4
 9 1 3 4 4 4 4 4 4 9 4 5 4 4
10 1 3 4 5 5 4 4 5 4 4 9 5 4
11 1 3 3 2 2 2 2 2 2 2 2 2 2
12 1 3 3 4 4 3 4 4 5 9 9 3 4
13 1 3 4 5 5 5 4 5 4 5 9 3 4
14 2 3 5 3 4 3 3 2 9 3 9 1 3
16 2 3 3 4 4 3 3 3 3 9 9 3 3
17 2 3 5 4 4 3 3 3 1 4 9 4 4
18 2 3 4 3 4 4 4 4 9 9 9 4 4

**********
during.r02
**********

SET WIDTH = 80

TITLE = PERFORMANCE INDICATORS DURING SEARCHING

DATA LIST FILE = 'during.dat2' FIXED
     / Subject#  01-02
       Class       04
       Occasion    06
       Q07         08
       Q08         10
       Q09         12
       Q10         14
       Q11         16
       Q12         18
       Q13         20


       Q16         26
       Q17         28
```

```
VARIABLE LABELS
       Subject#  "Subject #"
       Class     "Class"
       Occasion  "During"
       Q07       "Terminal"
       Q08       "Database Choice"
       Q09       "Subject Terms"
       Q10       "Search Command"
       Q11       "Connectors"
       Q12       "Print Command"
       Q13       "Truncation"


       Q16       "Logging Out"
       Q17       "Overall"

VALUE LABELS
       Class     1  'Full Period'
                 2  'Tour'

MISSING VALUE
 Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
 Q16 (9) Q17 (9)

MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q16 Q17
       by Class (1,2)

       / PRINT = CELLINFO       (ALL)
                 HOMOGENEITY    (ALL)
                 DESIGN         (ONEWAY)
                 ERROR          (ALL)
                 SIGNIF         (EIGEN)
       / PLOT =  STEMLEAF
                 BOXPLOTS
       / DISCRIM                (ALL)
       / DESIGN /

**********
during.o02
**********
124 Mar 91   SPSS-X Release 3.0 for VAX/UNIX                  Page   1
 08:41:05    Nova University              VAX 8550        ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 Trial period from March 1, 1991 for 1 month.

 Try the new SPSS-X Release 3.0 features:
```

```
* Interactive SPSS-X command execution          * Improvements in:
* Online Help                                   *   REPORT
* Nonlinear Regression                          *   TABLES
* Time Series and Forecasting (TRENDS)          *   Simplified Syntax
* Macro Facility                                *   Matrix I/O
```

See SPSS-X Users Guide, Third Edition for more information on these features.

```
  1  0
  2  0  SET WIDTH = 80
  3
  4  TITLE = PERFORMANCE INDICATORS DURING SEARCHING
  5
  6  DATA LIST FILE = 'during.dat2' FIXED
  7       / Subject#  01-02
  8         Class        04
  9         Occasion     06
 10         Q07          08
 11         Q08          10
 12         Q09          12
 13         Q10          14
 14         Q11          16
 15         Q12          18
 16         Q13          20
 17
 18
 19         Q16          26
 20         Q17          28
 21
```

THE COMMAND ABOVE READS 1 RECORDS FROM during.dat2

VARIABLE	REC	START	END	FORMAT	WIDTH	DEC
SUBJECT#	1	1	2	F	2	0
CLASS	1	4	4	F	1	0
OCCASION	1	6	6	F	1	0
Q07	1	8	8	F	1	0
Q08	1	10	10	F	1	0
Q09	1	12	12	F	1	0
Q10	1	14	14	F	1	0
Q11	1	16	16	F	1	0
Q12	1	18	18	F	1	0
Q13	1	20	20	F	1	0
Q16	1	26	26	F	1	0
Q17	1	28	28	F	1	0

END OF DATALIST TABLE

```
   22  VARIABLE LABELS
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page  2
 08:41:06  Nova University                 VAX 8550         ULTRIX 2.3

   23          Subject#  "Subject #"
   24          Class     "Class"
   25          Occasion  "During"
   26          Q07       "Terminal"
   27          Q08       "Database Choice"
   28          Q09       "Subject Terms"
   29          Q10       "Search Command"
   30          Q11       "Connectors"
   31          Q12       "Print Command"
   32          Q13       "Truncation"
   33
   34
   35          Q16       "Logging Out"
   36          Q17       "Overall"
   37
   38  VALUE LABELS
   39          Class     1  'Full Period'
   40                    2  'Tour'
   41
   42  MISSING VALUE
   43   Q07 (9) Q08 (9) Q09 (9) Q10 (9) Q11 (9) Q12 (9) Q13 (9)
   44   Q16 (9) Q17 (9)
   45
   46  MANOVA Q07 Q08 Q09 Q10 Q11 Q12 Q13 Q16 Q17
   47          by Class (1,2)
   48
   49          / PRINT = CELLINFO       (ALL)
   50                    HOMOGENEITY    (ALL)
   51                    DESIGN         (ONEWAY)
   52                    ERROR          (ALL)
   53                    SIGNIF         (EIGEN)
   54          / PLOT =  STEMLEAF
   55                    BOXPLOTS
   56          / DISCRIM                (ALL)
   57          / DESIGN /
   58
   59
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page   3
 08:41:06  Nova University                 VAX 8550         ULTRIX 2.3


* * * * * * A N A L Y S I S   O F   V A R I A N C E * * * * * *
```

8 cases accepted.
0 cases rejected because of out-of-range factor values.
7 cases rejected because of missing data.
2 non-empty cells.

1 design will be processed.

- - - -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 4
08:41:06 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Means and Standard Deviations (CONT.)

Variable .. Q12 Print Command

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.833	1.169	6
CLASS	Tour	3.000	.000	2
For entire sample		3.625	1.061	8

- -

Variable .. Q13 Truncation

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.833	.983	6
CLASS	Tour	2.000	1.414	2
For entire sample		3.375	1.302	8

- -

Variable .. Q16 Logging Out

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.667	1.211	6
CLASS	Tour	3.500	.707	2
For entire sample		3.625	1.061	8

- -

Variable .. Q17 Overall

FACTOR	CODE	Mean	Std. Dev.	N
CLASS	Full Per	3.667	.816	6
CLASS	Tour	3.500	.707	2
For entire sample		3.625	.744	8

- -

Univariate Homogeneity of Variance Tests

Variable .. Q07 Terminal

Cochrans C(3,2) = .75000, P = .391 (approx.)
Bartlett-Box F(1,25) = .46954, P = .499

Variable .. Q08 Database Choice

Cochrans C(3,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 5
08:41:06 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Univariate Homogeneity of Variance Tests (CONT.)

Variable .. Q09 Subject Terms

Cochrans C(3,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q10 Search Command

Cochrans C(3,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q11 Connectors

Cochrans C(3,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q12 Print Command

Cochrans C(3,2) = 1.00000, P = .000 (approx.)
1 Cell has zero variance, Bartlett-Box test cannot be done.

Variable .. Q13 Truncation

Cochrans C(3,2) = .67416, P = .566 (approx.)
Bartlett-Box F(1,25) = .18999, P = .667

Variable .. Q16 Logging Out

Cochrans C(3,2) = .74576, P = .400 (approx.)
Bartlett-Box F(1,25) = .28075, P = .601

Variable .. Q17 Overall

Cochrans C(3,2) = .57143, P = .819 (approx.)
Bartlett-Box F(1,25) = .02377, P = .879

- - - -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 6
08:41:06 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 1
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	3.333					
Q08	-.667	9.333				
Q09	.667	7.667	6.833			
Q10	3.000	4.000	4.500	5.500		
Q11	.667	4.667	4.333	3.000	3.333	
Q12	.667	7.667	6.833	4.500	4.333	6.833
Q13	.667	3.667	3.833	2.500	3.333	3.833
Q16	3.333	1.333	2.667	3.000	1.667	2.667
Q17	1.333	3.333	3.667	3.000	2.667	3.667

	Q13	Q16	Q17
Q13	4.833		
Q16	2.667	7.333	
Q17	3.667	3.333	3.333

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.667					
Q08	-.133	1.867				
Q09	.133	1.533	1.367			
Q10	.600	.800	.900	1.100		
Q11	.133	.933	.867	.600	.667	
Q12	.133	1.533	1.367	.900	.867	1.367
Q13	.133	.733	.767	.500	.667	.767
Q16	.667	.267	.533	.600	.333	.533
Q17	.267	.667	.733	.600	.533	.733

	Q13	Q16	Q17
Q13	.967		
Q16	.533	1.467	
Q17	.733	.667	.667

Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	.816					
Q08	-.120	1.366				
Q09	.140	.960	1.169			
Q10	.701	.558	.734	1.049		
Q11	.200	.837	.908	.701	.816	
Q12	.140	.960	1.000	.734	.908	1.169
Q13	.166	.546	.667	.485	.830	.667
Q16	.674	.161	.377	.472	.337	.377

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 1 (CONT.)
Correlation matrix with Standard Deviations on Diagonal (CONT.)

	Q07	Q08	Q09	Q10	Q11	Q12
Q17	.400	.598	.768	.701	.800	.768

	Q13	Q16	Q17
Q13	.983		
Q16	.448	1.211	
Q17	.914	.674	.816

>Note # 12171
>Singular variance-covariance matrix for this cell.

Cell Number .. 2
Sum of Squares and Cross-Products matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.000					
Q08	.000	.000				
Q09	.000	.000	.000			
Q10	.000	.000	.000	.000		
Q11	.000	.000	.000	.000	.000	
Q12	.000	.000	.000	.000	.000	.000
Q13	-2.000	.000	.000	.000	.000	.000
Q16	1.000	.000	.000	.000	.000	.000
Q17	1.000	.000	.000	.000	.000	.000

	Q13	Q16	Q17
Q13	2.000		
Q16	-1.000	.500	
Q17	-1.000	.500	.500

Variance-Covariance matrix

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	2.000					
Q08	.000	.000				
Q09	.000	.000	.000			
Q10	.000	.000	.000	.000		
Q11	.000	.000	.000	.000	.000	
Q12	.000	.000	.000	.000	.000	.000
Q13	-2.000	.000	.000	.000	.000	.000
Q16	1.000	.000	.000	.000	.000	.000
Q17	1.000	.000	.000	.000	.000	.000

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Cell Number .. 2 (CONT.)

Variance-Covariance matrix (CONT.)

	Q13	Q16	Q17
Q13	2.000		
Q16	-1.000	.500	
Q17	-1.000	.500	.500

Correlation matrix with Standard Deviations on Diagonal

	Q07	Q08	Q09	Q10	Q11	Q12
Q07	1.414					
Q08	.000	.000				
Q09	.000	.000	.000			
Q10	.000	.000	.000	.000		
Q11	.000	.000	.000	.000	.000	
Q12	.000	.000	.000	.000	.000	.000
Q13	-1.000	.000	.000	.000	.000	.000
Q16	1.000	.000	.000	.000	.000	.000
Q17	1.000	.000	.000	.000	.000	.000

	Q13	Q16	Q17
Q13	1.414		
Q16	-1.000	.707	
Q17	-1.000	1.000	.707

>Note # 12171
>Singular variance-covariance matrix for this cell.

>Note # 12172
>Singular variance-covariance matrix for all cells.

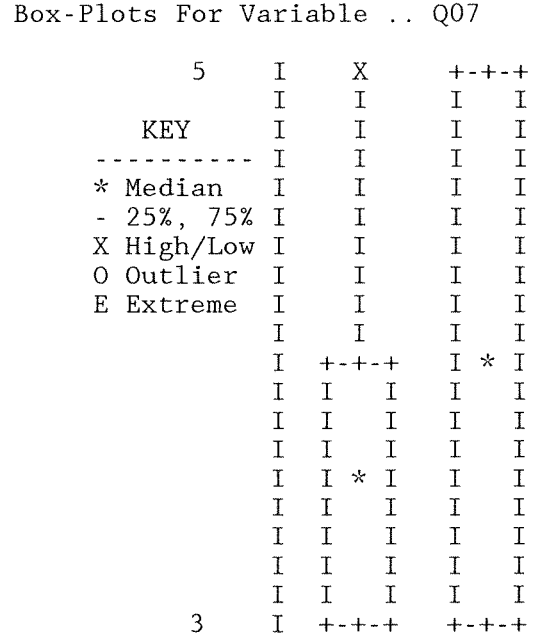
Boxs M-test cannot be performed.

- -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 9
08:41:07 Nova University VAX 8550 ULTRIX 2.3

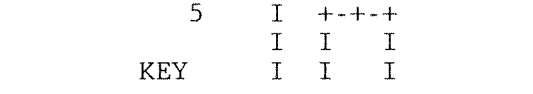
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

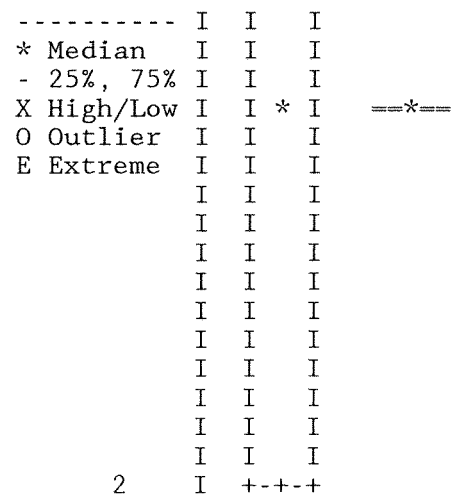
Box-Plots For Variable .. Q07 Terminal



- -

Box-Plots For Variable .. Q08 Database Choice

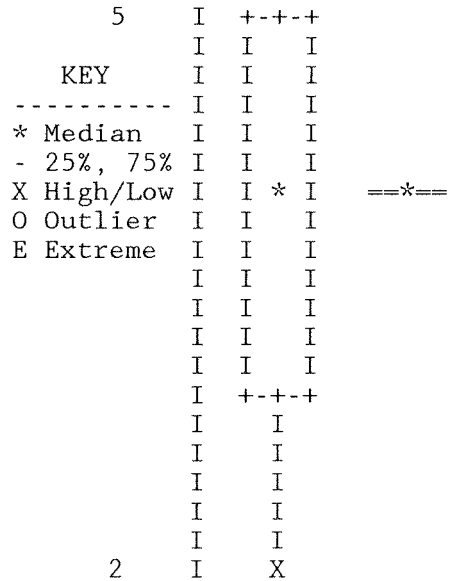




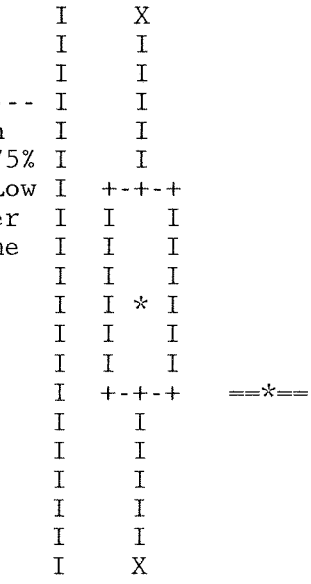
Variable----------
CLASS 1 2

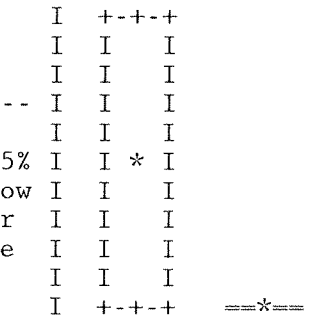
* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Box-Plots For Variable .. Q09 Subject Terms

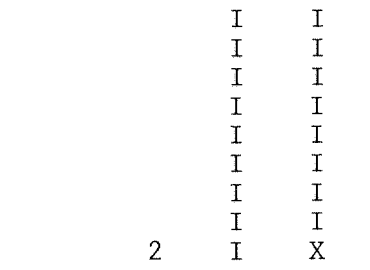


```
       Variable-------------------------------------------------------
        CLASS          1       2

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Box-Plots For Variable .. Q10          Search Command

            5     I    X
                  I    I
         KEY      I    I
      ---------- I    I
      * Median    I    I
      - 25%, 75% I    I
      X High/Low I  +-+-+
      O Outlier  I  I   I
      E Extreme  I  I   I
                  I  I   I
                  I  I * I
                  I  I   I
                  I  I   I
                  I  +-+-+   ==*==
                  I    I
                  I    I
                  I    I
                  I    I
                  I    I
            2     I    X

       Variable-------------------------------------------------------
        CLASS          1       2
```

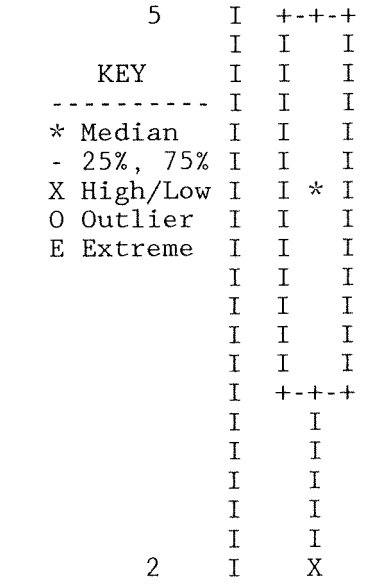




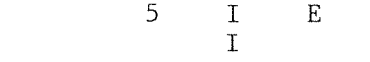
```
* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  Box-Plots For Variable .. Q11          Connectors

            4     I  +-+-+
                  I  I   I
         KEY      I  I   I
      ---------- I  I   I
      * Median    I  I   I
      - 25%, 75% I  I * I
      X High/Low I  I   I
      O Outlier  I  I   I
      E Extreme  I  I   I
                  I  I   I
                  I  +-+-+   ==*==
```

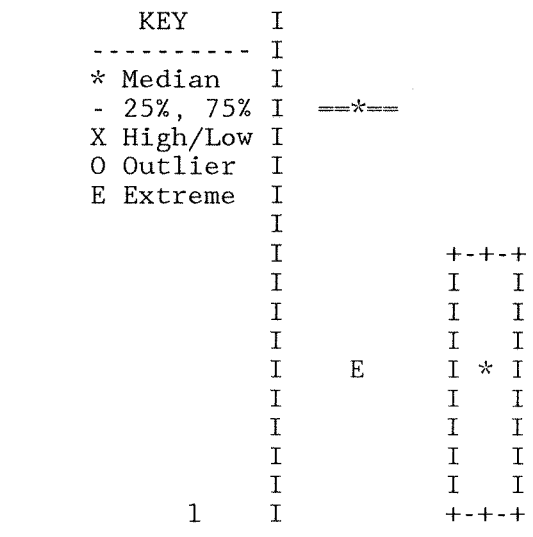


```
                I    I
                I    I
                I    I
                I    I
                I    I
                I    I
                I    I
                I    I
            2   I    X

      Variable-------------------------------------------------------
       CLASS         1       2

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Box-Plots For Variable .. Q12          Print Command

            5   I  +-+-+
                I  I   I
        KEY     I  I   I
     ---------- I  I   I
     * Median   I  I   I
     - 25%, 75% I  I   I
     X High/Low I  I * I
     O Outlier  I  I   I
     E Extreme  I  I   I
                I  I   I
                I  I   I
                I  I   I
                I  I   I
                I  +-+-+   ==*==
                I    I
                I    I
                I    I
                I    I
                I    I
            2   I    X

      Variable-------------------------------------------------------
       CLASS         1       2
```

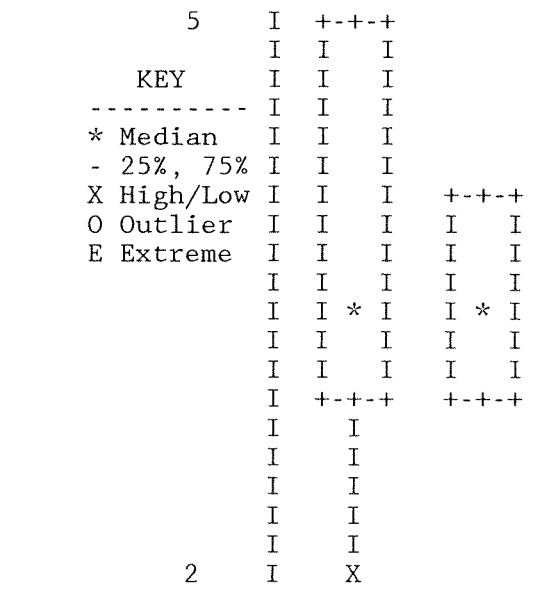



```
* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

 Box-Plots For Variable .. Q13          Truncation

            5   I    E
                I
```





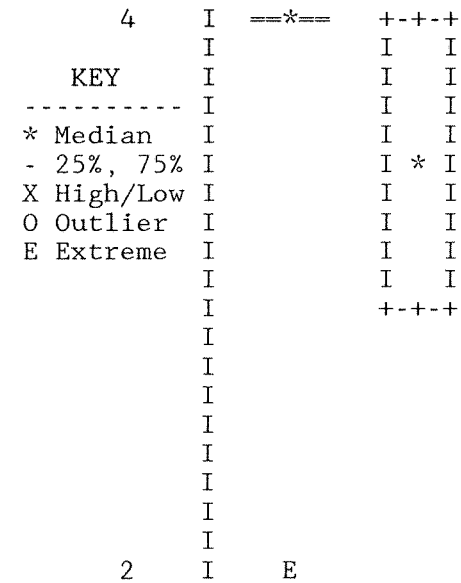
Box-Plots For Variable .. Q16 Logging Out



124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 13
08:41:07 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Box-Plots For Variable .. Q17 Overall



Variable----------
CLASS 1 2

- -

124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING Page 14
08:41:07 Nova University VAX 8550 ULTRIX 2.3

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q07 Terminal

```
3 . 0000
3 .
4 . 00
4 .
5 . 00
```

- -

Stem-and-leaf display for variable .. Q08 Database Choice

```
    2 . 00
    3 .
    4 . 0000
    5 . 00
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q09 Subject Terms

```
    2 . 0
    3 . 0
    4 . 0000
    5 . 00
```

- -

Stem-and-leaf display for variable .. Q10 Search Command

```
    2 . 0
    3 . 0000
    4 . 00
    5 . 0
```

- -

* * * * * * A N A L Y S I S O F V A R I A N C E -- DESIGN 1 * * * * * *

Stem-and-leaf display for variable .. Q11 Connectors

```
    2 . 0
    2 .
    3 . 0000
    3 .
    4 . 000
```

- -

```
  Stem-and-leaf display for variable .. Q12          Print Command

      2 . 0
      3 . 000
      4 . 00
      5 . 00

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page  17
 08:41:07  Nova University                 VAX 8550         ULTRIX 2.3

 * * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  Stem-and-leaf display for variable .. Q13          Truncation

      1 . 0
      2 . 0
      3 . 0
      4 . 0000
      5 . 0

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Stem-and-leaf display for variable .. Q16          Logging Out

      2 . 0
      3 . 000
      4 . 00
      5 . 00

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page  18
 08:41:07  Nova University                 VAX 8550         ULTRIX 2.3

* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  Stem-and-leaf display for variable .. Q17          Overall

      2 . 0
      2 .
      3 . 0
      3 .
      4 . 000000

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

One-way Basis for factor CLASS

	1	2
1	1.000	1.000
2	1.000	-1.000

Partition	DF	Columns
1	1	2

- - - -

```
* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  WITHIN CELLS Correlations with Std. Devs. on Diagonal (CONT.)
                   Q07        Q08        Q09        Q10        Q11        Q12

  Q17             .516       .557       .716       .653       .746       .716

                   Q13        Q16        Q17

  Q13            1.067
  Q16             .228      1.143
  Q17             .521       .700       .799

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  Statistics for WITHIN CELLS correlations

  Log(Determinant) =                  .00000
  Bartlett test of sphericity =       .      with 36 D. F.
  Significance =                        .

  F(max) criterion =                2.80000 with (9,6) D. F.

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  WITHIN CELLS Variances and Covariances

                   Q07        Q08        Q09        Q10        Q11        Q12

  Q07             .889
  Q08            -.111      1.556
  Q09             .111      1.278      1.139
  Q10             .500       .667       .750       .917
  Q11             .111       .778       .722       .500       .556
  Q12             .111      1.278      1.139       .750       .722      1.139
  Q13            -.222       .611       .639       .417       .556       .639
  Q16             .722       .222       .444       .500       .278       .444
  Q17             .389       .556       .611       .500       .444       .611

                   Q13        Q16        Q17

  Q13            1.139
  Q16             .278      1.306
  Q17             .444       .639       .639
```

```
* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  WITHIN CELLS Sum-of-Squares and Cross-Products

                  Q07        Q08        Q09        Q10        Q11        Q12

  Q07           5.333
  Q08           -.667      9.333
  Q09            .667      7.667      6.833
  Q10           3.000      4.000      4.500      5.500
  Q11            .667      4.667      4.333      3.000      3.333
  Q12            .667      7.667      6.833      4.500      4.333      6.833
  Q13          -1.333      3.667      3.833      2.500      3.333      3.833
  Q16           4.333      1.333      2.667      3.000      1.667      2.667
  Q17           2.333      3.333      3.667      3.000      2.667      3.667

                  Q13        Q16        Q17

  Q13           6.833
  Q16           1.667      7.833
  Q17           2.667      3.833      3.833

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  *                  *                                                  *
  *   W A R N I N G  * The WITHIN CELLS error matrix is SINGULAR.       *
  *                  * These variables are LINEARLY DEPENDENT           *
  *                  * on preceding ones ..                             *
  *                  *   Q12                                            *
  *                  *   Q16                                            *
  *                  *   Q17                                            *
  *                  * Multivariate tests will be skipped.              *
  *                  *                                                  *
  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
124 Mar 91 = PERFORMANCE INDICATORS DURING SEARCHING          Page  21
 08:41:07  Nova University                 VAX 8550         ULTRIX 2.3

* * * * * * A N A L Y S I S   O F   V A R I A N C E -- DESIGN   1 * * * * * *

  EFFECT .. CLASS
  Univariate F-tests with (1,6) D. F.
```

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
Q07	.16667	5.33333	.16667	.88889	.18750	.680
Q08	.16667	9.33333	.16667	1.55556	.10714	.755
Q09	.04167	6.83333	.04167	1.13889	.03659	.855
Q10	.37500	5.50000	.37500	.91667	.40909	.546
Q11	.16667	3.33333	.16667	.55556	.30000	.604
Q12	1.04167	6.83333	1.04167	1.13889	.91463	.376
Q13	5.04167	6.83333	5.04167	1.13889	4.42683	.080
Q16	.04167	7.83333	.04167	1.30556	.03191	.864
Q17	.04167	3.83333	.04167	.63889	.06522	.807

- -

22192 BYTES OF WORKSPACE NEEDED FOR MANOVA EXECUTION.

PRECEDING TASK REQUIRED 1.42 SECONDS CPU TIME; 1.85 SECONDS ELAPSED.

60

60 COMMAND LINES READ.
0 ERRORS DETECTED.
0 WARNINGS ISSUED.
2 SECONDS CPU TIME.
3 SECONDS ELAPSED TIME.
END OF JOB.

Appendix S

T-test on Actual Overall Skills vs. Perceived Skills

```
*********
resp.dat2
*********

01 1 4 3
02 1 4 5
03 1 4 4
04 1 3 4
05 1 4 4
06 1 4 4
07 1 4 4
08 1 4 3
09 1 4 3
10 1 4 5
11 1 2 3
12 1 4 3
13 1 4 1
14 2 3 5
15 2 4 3
16 2 3 3
17 4 4 3
18 2 4 3

********
resp.r02
********

SET WIDTH = 80
TITLE = PERFORMANCE VERSUS STUDENT PERCEIVED SKILL
DATA LIST FILE = 'resp.dat2' FIXED
     /  Subject#    01-02
        During         06
        After          08
VARIABLE LABELS
        Subject#    "Subject #"/
        During      "During DIALOG Search"/
        After       "After DIALOG Search".
TEMPORARY
FREQUENCIES VARIABLES = During
  / HISTOGRAM         = NORMAL
  / STATISTICS        = ALL

TEMPORARY
FREQUENCIES VARIABLES = After
  / HISTOGRAM         = NORMAL
  / STATISTICS        = ALL
```

```
T-TEST PAIRS = During,After


*******
resp.o2
*******
124 Mar 91    SPSS-X Release 3.0 for VAX/UNIX                    Page   1
 00:48:03     Nova University                VAX 8550         ULTRIX 2.3


 For ULTRIX 2.3          Nova University          License Number 19439
 Trial period from March 1, 1991 for 1 month.

 Try the new SPSS-X Release 3.0 features:

 * Interactive SPSS-X command execution          * Improvements in:
 * Online Help                                   *   REPORT
 * Nonlinear Regression                          *   TABLES
 * Time Series and Forecasting (TRENDS)          *   Simplified Syntax
 * Macro Facility                                *   Matrix I/O

 See SPSS-X Users Guide, Third Edition for more information on these features.

    1  0
    2  0  SET WIDTH = 80
    3  TITLE = PERFORMANCE VERSUS STUDENT PERCEIVED SKILL
    4  DATA LIST FILE = 'resp.dat2' FIXED
    5       /  Subject#    01-02
    6          During         06
    7          After          08

 THE COMMAND ABOVE READS   1 RECORDS FROM resp.dat2

           VARIABLE   REC  START    END          FORMAT  WIDTH  DEC

           SUBJECT#     1      1      2          F           2    0
           DURING       1      6      6          F           1    0
           AFTER        1      8      8          F           1    0

 END OF DATALIST TABLE


    8  VARIABLE LABELS
    9          Subject#    "Subject #"/
   10          During      "During DIALOG Search"/
   11          After       "After DIALOG Search".
   12  TEMPORARY
   13  FREQUENCIES VARIABLES = During
   14    / HISTOGRAM          = NORMAL
   15    / STATISTICS         = ALL
   16
```

There are 198360 bytes of memory available.
The largest contiguous area has 198360 bytes.

***** MEMORY ALLOWS A TOTAL OF 7083 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
THERE ALSO MAY BE UP TO 885 VALUE LABELS FOR EACH VARIABLE.

DURING During DIALOG Search

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	2	1	5.0	5.6	5.6
	3	3	15.0	16.7	22.2
	4	14	70.0	77.8	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

```
   COUNT       VALUE    ONE SYMBOL EQUALS APPROXIMATELY  .40 OCCURRENCES

       1        2.00  :**
       3        3.00  ********      .
      14        4.00  **************************:*********
                     I.........I.........I.........I.........I.........I
                     0         4         8        12        16        20
                               HISTOGRAM FREQUENCY
```

MEAN	3.722	STD ERR	.135	MEDIAN	4.000
MODE	4.000	STD DEV	.575	VARIANCE	.330
KURTOSIS	3.849	S E KURT	1.038	SKEWNESS	-2.072
S E SKEW	.536	RANGE	2.000	MINIMUM	2.000
MAXIMUM	4.000	SUM	67.000		

VALID CASES 18 MISSING CASES 2

PRECEDING TASK REQUIRED 0.16 SECONDS CPU TIME; 0.18 SECONDS ELAPSED.

```
  17  TEMPORARY
  18  FREQUENCIES VARIABLES = After
  19    / HISTOGRAM         = NORMAL
  20    / STATISTICS        = ALL
```

21

There are 199624 bytes of memory available.
The largest contiguous area has 199584 bytes.

***** MEMORY ALLOWS A TOTAL OF 7127 VALUES, ACCUMULATED ACROSS ALL VARIABLES.
THERE ALSO MAY BE UP TO 891 VALUE LABELS FOR EACH VARIABLE.

AFTER After DIALOG Search

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
	1	1	5.0	5.6	5.6
	3	9	45.0	50.0	55.6
	4	5	25.0	27.8	83.3
	5	3	15.0	16.7	100.0
	.	2	10.0	MISSING	
	TOTAL	20	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .20 OCCURRENCES
1	1.00	*:***
0	2.00	.
9	3.00	********************************:**********
5	4.00	************************** .
3	5.00	***********:***

I.....I.....I.....I.....I.....I
0 2 4 6 8 10
HISTOGRAM FREQUENCY

MEAN	3.500	STD ERR	.232	MEDIAN	3.000
MODE	3.000	STD DEV	.985	VARIANCE	.971
KURTOSIS	1.293	S E KURT	1.038	SKEWNESS	-.415
S E SKEW	.536	RANGE	4.000	MINIMUM	1.000
MAXIMUM	5.000	SUM	63.000		

VALID CASES 18 MISSING CASES 2

PRECEDING TASK REQUIRED 0.09 SECONDS CPU TIME; 0.09 SECONDS ELAPSED.

```
  22  T-TEST PAIRS = During,After
  23
  24
```

There are 199616 bytes of memory available.
The largest contiguous area has 199264 bytes.

THE T-TEST PROBLEM REQUIRES 64 BYTES OF WORKSPACE

- T - T E S T - - - - - - - - - - - - - - - - - - -

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
DURING	During DIALOG Search			
	18	3.7222	0.575	0.135
	18	3.5000	0.985	0.232
AFTER	After DIALOG Search			

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.	T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
0.2222	1.166	0.275	-0.052	0.838	0.81	17	0.430

PRECEDING TASK REQUIRED 0.07 SECONDS CPU TIME; 0.07 SECONDS ELAPSED.

```
  25

    25 COMMAND LINES READ.
     0 ERRORS DETECTED.
     0 WARNINGS ISSUED.
     1 SECONDS CPU TIME.
     1 SECONDS ELAPSED TIME.
       END OF JOB.
```

Appendix T

Impact Statement

This study served as an initial inquiry on the impact on the library's staff, physical resources and financial resources from a bibliographic outreach service, using DIALOG's Classroom Instruction Program to teach end-users to search on DIALOG. The study was designed to address the following research objective:

At the completion of the project, the students in the test classes will be able to conduct online searches.

Review of the work of other librarians who teach end-user searching on the university and high school level resulted in the observation that use of DIALOG CIP has been reported on the high school and community college level, but not the university level. Yet DIALOG CIP is one of the lowest priced databases.

A study was conducted with research classes offered by two professors in the field of special education on whether the information presented in an instruction session based on six learning objectives--choosing a database, choosing search terms and connectors, using search commands, modifying the search online, printing search results, and logging out--would enable graduate students to conduct an online search. Rockman (1987) stated that the advantage of course-integrated instruction is that users are motivated to learn retrieval skills when the focus is

on a specific information need within the context of an already established class assignment (p. 12).

Despite differences between perceived and actual skill, the objective of this study was obtained. Students did learn to search DIALOG and were able to print out citations on subject terms they had chosen and entered.

The implementation of a DIALOG Classroom Instruction Program at Winona State University will mean the involvement of library staff in training. If training is limited to the amount given in this study, then the library must be prepared to have staff members available to help answer questions during the searches. This study has demonstrated that students can learn to search after a small amount of training, but, in general the students range in capability from those able to search with very little assistance to those requiring much assistance.

Outside of teaching responsibilities, Gilreath, Dodd, & Hutchins (1984) found that reference staff, both professional and non-professional, performed three functions: traffic controllers, technicians--logging patrons on to system, maintaining session statistics and resolving any equipment problems--and consultants (p. 71). Friend (1985, p. 141; 1988, p. 101) and Lewontin (1991, p. 22) also point out the need for librarians as consultants for end-users.

Mader and Park (1984), in recommending that Memphis State University continue its BRS/After Dark end-user search service

presented the staffing needs for both full scale service and minimum service. Both versions listed a professional librarian and a student worker assigned to the service (p. 11-12). Sieburth (1988) mentioned "If patron fees are collected, there is additional management responsibility for handling the money, figuring charges,and keeping records" (p. 296). Gilbreath, Dodd and Hutchins (1984) noted that due to the physical arrangement of the equipment and the heavy patron load

> ...staff assignments were adjusted in order to have one person stationed in the computer terminal area on evenings when the services were made available. This arrangement proved to be much more satisfactory both in reducing staff frustration and in providing timely assistance to patrons. (p. 71)

Sieburth (1988) commented,

> Staff time will be required to assist patrons with the database systems. Even simple procedures will often generate some questions. Setting up for the day, putting away at night, assisting with online or offline procedures, hiring and training students to oversee the operation will be added responsibilities. (p. 294)

Diodato (1988) commented that an increase in online searches caused more interlibrary loan requests (p. 149), which will also have an impact on Maxwell Library's staff.

The cost of the program depends upon how many students are involved. An earlier estimate listed a possible maximum cost of

$465.00 for 31 students limited to one hour of searching ($15) each. The actual cost of the program came to $215.72, which was less than the total amount of students involved in the program (18) times the cost of one hour of searching (x $15 = $270).

One performance indicator not examined during this study was the amount of time spent online. Students were limited to an hour of searching, but professional searchers seldom need that much time in order to perform an effective search. This factor may have an bearing in future classes. An end-user study at Pennsylvania State University had limited student participants to a 40-minute search. Students averaged 30 minutes online, with a range between 4.32 to 58.14 minutes (Friend, 1985, p. 138).

DIALOG CIP can only be used in conjunction with formal, supervised programs to teach online searching (DIALOG Marketing, personal communication, September 4, 1990). Once end-users have been trained, they will have to use the full version of DIALOG or Knowledge Index, and Maxwell Library currently charges for online searching. Sieburth (1988) commented,

> Online systems that will charge to credit cards provide one method of collecting fees. A vending system that automatically logs on and off and allows a defined period of search time is another. Otherwise, monitoring time, printing and collecting cash can require a great deal of time. (p.292-293)

Additional terminals will be needed to provide more access, both for the CIP students and for trained end-users, which in turn means more phone lines and space for workstations. Several librarians involved in end-user training (Batista & Einhorn, 1988; Bell, 1990; Wright & Friend, 1991) also recommend using computer workstations with video projectors for more successful instruction in a group setting. After the failure of Winona State University's Computer Services to provide cables compatible with the DIALOG system, the library should look into obtaining its own workstation or video projector.

The comments of the students involved in the DIALOG Classroom Program, both at the end of the questionnaire and given verbally at the end of DIALOG searches, indicate that having the DIALOG Classroom Instruction Program available would be beneficial for Winona State University students. As Rockman (1987) stated, the traditional teaching role of the library has changed. The goal today is to teach patrons how to tap into any information source (p. 10). Maxwell Library needs to establish itself as a provider of online information sources and as a consultant and training resource for users who wish to access such sources.

At other libraries, the growth in end-user searching has had a positive impact on the library's public image and the relationship between library staff and researchers (Burris & Molinke, 1991, p. 39). Sieburth (1988) listed as two reasons to offer end-user searching

"...To attract students to the library and to increase their interest in information retrieval...[and]...To generate excellent publicity for the library" (p. 276-277).

Until a better indication of demand for this service is established, and until the library has classrooms (i.e., in a new building) the best manner of presentation will be as part of an existing course. At that point, the amount of training needed would be dependent upon what the individual instructor will be requiring of the students. If the students only need to find a small amount of articles, then the amount of training given in this study may be enough. If, however, students will be required to search DIALOG as part of a major research project or thesis, then training should be more extensive and additional time for online practice should be provided. Two students involved in this study commented that additional time would be helpful.

Appendix U

Biographical Sketch

Kathryn Sullivan is the Periodicals Librarian at Maxwell Library, Winona State University, Winona, MN. She is also in charge of database search services (primarily through Dialog) at that library.

Ms. Sullivan received her B.A. (1975) from Northern Illinois University, majoring in Anthropology, and her M.A. (1977), also from Northern Illinois University, in Library Science. She is finishing her degree in the DAIS program at Nova University. Ms. Sullivan has had three articles published through the Educational Resource Information Center (ERIC) and a software review published in CD-ROM Professional.

I certify that I have read and am willing to sponsor this dissertation submitted by Kathryn Sullivan. In my opinion it conforms to acceptable standards and is fully adequate in scope and quality as a dissertation for the degree of Doctor of Science at Nova University

August 29, 1991
(date)

Marilyn Kemper Littman
NAME OF ADVISOR
dissertation Advisor

I certify that I have read this dissertation and in my opinion it conforms to acceptable standards for a dissertation for the degree of Doctor of Science at Nova University.

October 2, 1991
(date)

Patricia B. Kistenmacher
NAME OF ADVISOR
Local Committee Member

This dissertation was submitted to the Central Staff of the Center For Computer Information Sciences of Nova University and is acceptable as partial fulfillment of the requirements for the degree of Doctor of Science.

August 29, 1991
(date)

Thy W. Martin
NAME OF ADVISOR
Central Staff Committee Member