

Statistical and Qualitative Software Support Service

Needs Assessment and Recommendations

Spring 2009

Background

The Statistical and Qualitative Software Support Service moved from University Information Services (IS) to Libraries and Media Services (LMS) in 2006. LMS saw this as an important extension of its goal of supporting the access to and use of information—in this case the information being data. The move included one staff position, then occupied by Jan Winchell, that provided consulting services and modest budget support for software (\$47,000). Jan has since retired, and the position was filled in May 2008 by Tina Ughrin.

The service and software offered had largely remained constant for some time. With the organizational and staff changes that had taken place, it was determined a needs assessment would identify any needed changes to services and software to insure this Service has the greatest possible impact on meeting campus teaching and research needs.

Current Status

Support Services

--Consulting

The Service primarily offers on-on-one consulting services for the use of Kent State licensed statistical and qualitative software packages and databases. The Service is available to individual KSU faculty, their graduate students, and for both undergraduate and graduate students needing to use these resources in their coursework. These sessions include assisting students and faculty with choosing software, data manipulation, choosing and running statistical analyses within software packages, and assistance in interpreting output.

--Instruction

The Service also provides on-demand seminars for particular classes and some 60-minute seminars similar to others offered by LMS. These are customized presentations and have at times been requested by groups of students themselves, independent of their instructor, when they have identified a particular need. Increased emphasis is now being made to create online guides as well and enhance the usefulness of the Service's website. To date this includes software installation tutorials and links to online resources.

Issues: There is only one staff member for this Service. Although she is highly trained and experienced, there needs to be a greater mix of services to extend her expertise to more than can be served through one-on-one assistance and to insure that we are reaching students as well as researchers. Prioritization is often necessary to meet the needs of faculty and student research and learning needs. This suggests continuing current efforts to offer customized instructional sessions and to promote self-help through online aids.

Software Budget

Centralized licensing of software reduces University expenditures overall and increases access. Presently, there are University-site licenses for eight statistical and qualitative software packages or versions of packages (e.g., Mac and Windows versions of SPSS). Most of these have been in place for some time. However, because site licenses have annual costs that have been increasing at a rate of about 4% per year, the budgetary issues are significant given a static budget. The only funding for statistical software that has been continued since the Service moved to LMS in 1996 has been the annual transfer of \$47,000 by IS to LMS. There have been no inflationary increases, placing real constraints on what can be offered.

One adjustment made this past year followed a review (via user statistics and survey results) of Unix Server packages (IMSL Fortran, SPSS, and SAS). It was clear that both SAS and SPSS users demonstrate strong preference for the PC versions instead of server access. The review confirmed low usage of the server packages, and these were subsequently cancelled in 2008. These cancellations resulted in an annual savings of nearly \$8,000, bringing the cost of software licenses for the current fiscal year to \$46,638.

The only other revenue is from the sale of software to individual campus users and for campus computer labs at a heavily subsidized price. The Libraries recognize that there is a fine line between revenue generation and encouraging individuals to purchase software to insure copyright compliance. So an effort has been made to have the pricing schedule sensitive to that. This year, we increased prices on statistical and qualitative software for individuals and labs from \$40 per package to a range from \$60 to \$100 per package. We project sales revenue for the year to amount to \$5,000. We do not believe that the prices can be raised further without encouraging software piracy.

At present, the statistical software account is cushioned by a one-time transfer of funds from the Provost's Office. Most of those funds were expended in 2008 to purchase copies of Mplus software. Copies of Mplus were purchased to address consistent, multiple requests. However, its annual license cost of \$11,165/year was prohibitive. Therefore, initial campus needs were met by being able to provide copies at a vastly reduced price. But because the package is not licensed, users will not receive technical support from Mplus, nor will they be eligible for upgrades. Users who purchased a copy at the KSU price of \$40 will be able to continue to use the package they have.

Issues: Changes made in 2008/09 brought annual costs in line with the ongoing budget for software. The challenge going forward will be to manage existing software given the lack of sufficient, stable funding and of annual increases to address inflation. Additionally, it will be necessary to find ways to address other campus needs—new software, additional seats for some existing packages, other means of access to software. Any discussion needs to review the pricing schedule for products sold to campus users and to campus labs with their multiple seats.

Software Distribution and Tracking

Once this Service came to LMS, a priority was placed on streamlining the distribution and tracking of software. LMS Web developers developed an online database for tracking statistical and qualitative software purchases. This online system went live in January 2008 and provides:

- An online tracking database used when software purchases are sold through the Audio Visual Services counter. Included in this database is the number of copies available, the number of copies sold, pricing, and eligibility by status (faculty, student).
- Online purchasing and downloading of some software packages.
- Email updating for software packages, including patches and other important messages.
- Archiving of older versions of software.
- Tracking users who have left the University.

With this system, it is possible to insure license compliance, maximize use of allowable seats, and identify piracy and software policy abuse.

Issues: There is a good, working mechanism in place to monitor the distribution and tracking of software. However, the Service needs to continue as an advocate for appropriate, legal use of software.

Promotion

Most of Jan Winchell's promotion was done through word-of-mouth as she already had an established client base when she moved from IS to LMS. In the past months the information on the LMS Website regarding software availability and support services has been enhanced (<http://www.library.kent.edu/statsoftware>). This has included providing specific directions for installing specific software, minimum hardware requirements for specific software packages, eligibility for purchasing KSU licensed software.

Updating information has also been provided through *Footnotes*, liaison librarians, and to Chairs and Directors. Additionally, flyers targeted to students, faculty, and administrative/staff respectively were created and disseminated throughout the University through e-mail, placed on departmental bulletin boards, and included by the Faculty Professional Development Center in the binders for new faculty. Personal contacts with staff and administrators in various Centers and Institutes at the University have been made to inform them of available resources and services, generating requests for customized seminars.

Issues: Despite these efforts, we believe that the services and resources are not known to many across campus who would find them useful to their work.

Needs Assessment: Goals and Sources of Input

The issues facing this Service are:

- What mix of services would support the greatest number of campus users to serve both teaching and research needs?
- What set of software packages would have the greatest impact on needs?
- What combination of funding approaches might be used to address needs?
- What efforts might be taken to do more to promote the availability of software and support services to key user groups?

These prompted LMS to undertake a campus-wide needs assessment in fall 2008. The *stakeholders* were identified as: KSU students (graduate and undergraduate), faculty, and administrators/staff. The following report highlights the findings and presents recommendations coming from the study.

The goals of the needs assessment were:

1. Determine the optimum model for software support services.
2. Identify software needs for teaching and research and possible funding models.
3. Determine how to promote the availability of software and support services to key user groups.

Input for the study came from a variety of sources:

- focus groups including all stakeholder groups
- campus-wide online survey
- survey of services at other institutions
- literature search of use of software reported in the journal literature of several disciplines
- various internal sources including: client database, budget reports, current software collection

Focus Groups

We conducted three student and three faculty/administrator/staff focus groups in fall 2008 with a total of 46 participants. Participants came from departments ranging from Chemistry and Psychology to

Accounting and from centers (such as the Bureau of Research and Training Services). 22 focus group participants were faculty/staff/administrators, and 24 participants were KSU students.

Online Survey

An online survey was then constructed using input from the focus groups. It was broadly distributed across campus in fall 2008 to all stakeholder groups. [A copy of the survey is available at: <http://www.library.kent.edu/statsurvey.pdf>]. There were 214 responses to the survey. Respondents were divided fairly evenly between students and faculty/staff/administration. Graduate students comprised 41% and faculty 43%. Every college with the exception of the Honors College was represented. Student respondents were predominantly in majors housed in EHHS (40%) and Arts & Sciences (37%). The largest group of faculty respondents by college were Arts & Sciences (42.6%) and EHHS (27.8%). The complete breakdown by status, college, and majors is shown in Appendix A.

Client Base

Tina Ughrin has seen 56 individual clients from May 19, 2008, through December 19, 2008, with 28% from both A&S and EHHS and diverse representation of departments from within each. Clients were primarily faculty and graduate students. Some clients have been from campus centers such as the Institute for the Study and Prevention of Violence. Appendix B shows the breakdown of client affiliation by college and department.

Findings

Goal 1: Determine the optimum model for software support services.

Focus Group Suggested Services

Focus group participants provided the list of possible support services. These included:

- online help and documentation
- one-on-one consulting,
- on-demand seminars
- regularly offered seminars
- assistance getting data into an analyzable format
- guest speaker colloquium series
- on-demand instruction tailored for a specific class
- assistance in selecting appropriate packages
- a user discussion list
- user-groups with brown bags etc.

An additional suggestion did not make it onto the subsequent survey, but is worth considering. A number of faculty members, in particular, suggested an advisory panel be formed to help make software and service decisions.

Survey Results on Preferred Services

Suggestions from the focus group were included on the survey. Survey respondents rated online help and documentation (84%), one-on-one consulting (81%), and on-demand seminars (76%) as the three services most likely to be used. These results are consistent with established practice and initiatives currently in place. User groups with brown bags and user discussion lists (both suggestions arising from focus groups) were the services ranked as least likely to be used.

Client Feedback:

The feedback received from consulting clients and those requesting on-demand seminars has been very positive. Consulting clients are particularly happy with the level of support services available and that

they are able to purchase software through KSU at a discount. Follow-up with on-demand seminar clients on the usefulness of the sessions has indicated that the majority felt that quality of the training was very good to excellent, that the instructor demonstrated expert knowledge on the topic, and that they felt more comfortable with the software package used in the training. There has also been positive feedback on the guides available through the enhanced website.

Review of Statistical and Qualitative Software Support Services at Other Institutions

A review was made of support services offered at other institutions. Six universities with similar undergraduate and graduate enrollment numbers were examined. Statistical software services were housed in computing services, statistics departments, college centers, and a library. Several of the universities utilized the expertise of faculty on campus. Central Michigan University noted that they were examining the possibility of an advisory board “to represent the interests of the respective colleges and their particular statistical consulting requirements.” In addition to the universities mentioned above, seven state institutions in Ohio were also examined. Only three of the universities had information on their websites about statistical consulting services – Ohio State University, Bowling Green State University, and the University of Cincinnati. OSU has a large program in their Department of Statistics. BGSU has a program housed in their College of Business Administration. Finally, UT has a limited program in their Department of Mathematics. A detailed summary of findings is at Appendix C.

Goal 2: Identify software needs for teaching and research and possible funding models.

Software Needs

Focus Group Results

Focus group participants were primarily concerned with pricing and availability of software packages. Most participants expressed appreciation for the subsidized prices for the statistical and qualitative software. However, many noted that once software prices hit \$100 or more, pirated copies tend to show up on departmental and student computers.

SPSS, SAS, Stata, AMOS, and NVivo were considered core products that are necessary for the work done in most of the fields represented. Additional software package requests made during focus group sessions were included in the survey that followed the fall focus groups.

Of particular note, focus group participants from biology, chemistry, and physics expressed concern that many of the software packages they need are expected to be purchased with soft money (e.g., grants). They argued that when the University relies on soft money, such software cannot be updated, cannot be used by faculty and students not on the grant, and cannot be used for teaching purposes. Although these three fields bring in substantial soft money, the participants argued that it is important for statistical software packages to be supported centrally in order to best facilitate research and teaching.

Survey Results

--General Software Packages

The majority of respondents rated SPSS for Windows as an important general statistics software package for teaching and research in their field (79%). Next was SAS with 35% with an “important” rating for teaching and research in their field. Responses to the question: “what specialty statistics software is important to teaching and research in your field” was lower than the responses to general statistical software. No specialty statistics package (such as LISREL) received an endorsement from more than 22% of the respondents.

--Packages for Quantitative Analyses

Beyond general statistical needs, an effort was also made to determine what analytical techniques are being used that requires specialty statistical software. Respondents were asked what analytical techniques

are most frequently used within their discipline. This was broken down between univariate, nonparametric, and multivariate analyses. This input was then mapped to four of the software packages licensed at KSU (SPSS for Windows and Mac, AMOS, and SAS) to identify the coverage available. Interestingly, almost all of the 50 types of analyses considered important to focus group and survey respondents can reportedly be accomplished with SAS. Many of the analyses can be accomplished through SPSS and AMOS combined. A matrix for how each of the three types of analyses matches with existing packages is presented in Appendix D.

--Packages for Qualitative Analyses

The two most frequently checked qualitative software packages were SPSS Text Analysis for Surveys (42%) and NVivo (23%).

Use of Statistical Software as Reported in the Literature

A search was also made of the journal literature to get some measure of the frequency with which various statistical software packages were reported to have been used from 2000 to the present. Although a somewhat rough measure, this review provided another disciplinary view. A search was done by statistical package (SPSS, SAS, etc.) in the primary research databases for education, psychology, business, sociology, nursing, physics, and biology. SAS and SPSS were mentioned most frequently overall, with LISREL next. These results are shown in Appendix E.

Funding Models

An alternative to centralized licensing of software is to negotiate a group purchase that offers significant cost savings. LMS is currently brokering such a package for ten departments and two Centers to purchase Stata. It is expected this bulk purchase will drop the per copy price by \$100, with a potential savings to the University of \$7,000. The Service could develop a mechanism for identifying parties with common interest in purchasing a package and brokering a group deal to realize savings. This approach would not fund the establishment of site licenses, however.

Another approach to increasing access in support of teaching and research could be the creation of a centralized statistics lab in the Main Library. This could have one or two copies of specialized packages that are not used on a regular basis, but for which there is a unique need.

An additional suggestion that might be explored is for the Libraries to have a laptop that a user could borrow for a set loan period that would have specialized software loaded on it. This would be similar to the lending presently done for digital cameras.

Goal 3. Determine how to promote the availability of software and support services to key user groups.

Focus Group and Survey Suggestions

Faculty and students in the focus groups, survey, and client base suggested several ways the availability of software and support services could be promoted. These suggestions included:

- e-mails to department administrative assistants
- software package-based discussion lists
- inclusion of a paragraph about available software and services in research course syllabi
- personal visits to departmental meetings
- contacting the FPDC and On-Tap in the fall to reach new faculty and graduate students.

This response highlights the interest for targeted updates and introduction to new software:

“I would like to see more statistical workshops offered on campus, or receive flyers when such workshops are offered. Also, I would like to receive email or notification when new software is purchased by the university and if there is a seminar or some sort to demonstrate how to use it.”

Recommendations

1. Advisory Panel for the Statistical and Qualitative Software Service

We recommend the creation of a statistical and qualitative software advisory panel that consists of faculty, administrators, and students representing a variety of colleges, departments, and centers. The Panel would provide formative feedback on software and support service needs, assist in reviewing budget constraints, and propose the addition and elimination of software.

2. Stable centralized financial support

Centralizing the purchase of statistical and qualitative software through the Libraries is imperative to saving the University money on widely used statistical and qualitative software packages. More software, with more seats, is made available than is possible through departmental funds alone. Student needs are addressed, which is typically not possible through software purchased through grant funding. Centralized purchasing also allows for providing support services for a core set packages.

We recommend that the current static allocation for software (\$47,000 from IS) be made a permanent transfer to the Libraries' budget and increased to \$50,000 with an annual 4% increase to address inflation. This will maintain the status quo for currently licensed packages with the same number of seats. These funds will be supplemented to a small degree by sales of locally licensed software.

3. Other possible funding models

The Advisory Panel will be called upon to advise on needed changes and to explore other models to insure software availability. One is for this Service to act as a broker to bring together interested parties to obtain a software package at a more attractive price than they could get individually. Also for consideration is the creation of an open statistics computer lab with one or two seats available for lesser used packages to provide access to students, or short-term loan of a laptop with specialty software installed.

4. Optimum model for software support services

We recommend that the Service continue to offer one-on-one consulting, but place greater emphasis on on-demand seminars and extensive online tutorials as this service is provided by an individual to a large 8 campus University system. This is consistent with the focus group and survey data and will make it possible to serve a larger portion of the KSU community. The Service will continue to survey on-demand seminar patrons and will expand the survey tool to include online users and one-on-one clients. Such formative feedback will help in the updating of training materials and adjusting presentation formats to better serve patrons' needs.

5. Support of ethical use

The Service needs to continue to monitor software licenses and be an advocate for appropriate use. It is clear that prices judged to be too steep for locally sold copies can lead to wide-spread piracy. The Libraries' new online software management system makes it easier to track the legal use of software allowed through license agreements.

6. Promotion of available software and support services to key user groups.

We recommend that the Service continue to use the various dissemination avenues presently in place and that further collaboration be established with KSU centers and the Faculty Professional Development Center in particular.

Appendix A. Fall 2008 Survey (Respondents, n=214)

Table 1. Respondents by Status (%)

Status	Percent
Doctoral students	28%
Tenured faculty	20%
Tenure-track faculty	17%
Master's students	13%
Administrative/Professional	7%
Non-tenure track faculty	6%
Undergraduate students	5%
Postdoctoral/Visiting faculty	4%

Table 2. Respondents by College (%)

College	Students	Faculty
Arts	3%	2%
Arts and Sciences	37%	43%
Business Administration	7%	15%
Communication & Information	10%	5%
Education, Health, & Human Services	40%	28%
Nursing	2%	7%
Technology	0%	1%

Table 3. Respondents by Major/Department/Center (%)

Major/Dept/Center	Students	Faculty	Major/Dept/Center	Students	Faculty
Accounting	2%	4%	Geology	1%	1%
ACHVE	0%	2%	Higher Ed. Administration	9%	0%
Advertising	1%	0%	Instructional Technology	1%	1%
Anthropology	0%	2%	Journalism	3%	0%
Aquatic Ecology	1%	0%	Justice Studies	0%	2%
Biology	1%	3%	Management Info. Systems	2%	6%
Biopsychology	1%	0%	Marketing	0%	2%
BRTS	0%	3%	Mathematics	0%	3%
BSCI	2%	0%	Music	0%	1%
CHDS	1%	0%	Music Education	1%	0%
Communication Studies	7%	4%	Nursing	2%	7%
Counseling	3%	0%	Political Science	3%	5%
Curriculum & Instruction	3%	6%	Post Grad -- Nondegree	1%	0%
Design	1%	0%	Psychology	17%	8%
Dietetics	1%	0%	Public Relations	2%	0%
Education	4%	2%	RAGS	0%	1%
Educational Psychology	1%	0%	Rehabilitation Counseling	1%	0%
EFSS	0%	5%	RPIE	0%	2%
English	1%	0%	RPTM	0%	1%
Evaluation & Measurement	5%	0%	School of Library and Information Science	0%	1%
Exercise, Leisure, & Sport	0%	1%	School Psychology	3%	0%
Fashion Merchandizing	1%	0%	Sociology	8%	8%
Fiber Arts	1%	1%	Special Education	4%	0%
Finance	2%	2%	Speech & Language Pathology	1%	3%
FPDC	0%	1%	Technology	0%	2%
Geography	0%	3%	Vocational Education	1%	0%

Appendix B: Client Database

Table 1: Consulting Clients by College/Department		Table 2: Support Requested by Consulting Clients by Software Package	
	<u>Percent</u>	Software	Percent
Arts and Sciences	28%	SPSS	63%
Geography		SAS and SPSS	7%
Geology		NVivo	7%
Justice Studies		SAS	2%
Modern Language		Winsteps and SPSS	2%
Political Science		CRSP	2%
Psychology		AMOS	0%
Sociology		LISREL	0%
Education, Health, and Human Services	28%	EQS	0%
Counseling		Mplus	0%
Cultural Foundations			
Early Childhood Special Education			
Higher Education			
Hospitality Management			
Music Education			
Nutrition			
Business Administration	17%		
Accounting			
Marketing			
Communication and Information	13%		
Communication			
School of Library Science			
Nursing	7%		
Not Applicable	4%		
Technology	2%		
Libraries and Media Services	2%		

Appendix C: Models from Other Similar Institutions

Comparison of Statistical and Qualitative Software Services -- Institutions within Ohio							
University	Location of Services within Institution	Scope of Services	Number of Staff Providing Services	Who Can Use Services	Packages Supported	Website	Online Tutorials
Bowling Green State University	College of Business Administration: Applied Statistics and Operations Research program	Research design, Data Analysis, and Interpretation of Results	At least one director, multiple graduate students.	Faculty and Students	Unclear from website	http://www.cba.bgsu.edu/asor/ConsultingServices.html	No
Cleveland State University	Could not find services online				SAS, SPSS	http://www.csuohio.edu/offices/ist/studentcomputing/statistical.html	No
Ohio State University	Department of Statistics	Research Design, Survey Construction, Data Analysis, Presentation of Results, Database Development	One director, one operations manager, two graduate students and a faculty advisory board	Faculty and Students	SAS, SPSS, SYSTAT, S-Plus, JMP, and Minitab	http://www.scs.osu.edu/index.html	No
Youngstown State University	Could not find services online				SPSS on a server	No	No
University of Toledo	Department of Mathematics	Research design, Data Analysis, and Interpretation of Results	One Director and several graduate students	Outside clients, faculty, staff, and students	Unclear from website	http://www.math.utoledo.edu/stat_consulting.html	No
University of Akron	Department of Statistics	Research design, Data Analysis, and Interpretation of Results	Director, multiple graduate students from Stat Dept.	Faculty, Staff, and Students	Unclear from website	http://www3.uakron.edu/stat/consulting.html	No

Comparison of Statistical and Qualitative Software Services (Institutions outside of Ohio)							
<i>University</i>	<i>Location of Services within Institution</i>	<i>Scope of Services</i>	<i>Number of Staff Providing Services</i>	<i>Who Can Use Services</i>	<i>Packages Supported</i>	<i>Website</i>	<i>Online Tutorials</i>
Ball State University	University Computing Services -- Academic Resources	Research Design, Survey Construction, Data Analysis, Interpretation of Results, and Data Entry	More than one (unclear from website the structure of staff)	Faculty, Staff, and Students	For interested individuals, UCS has a site license for the SPSS, SAS, and AMOS programs	http://cms.bsu.edu/About/AdministrativeOffices/UCS/AcademicResources/StatisticalandResearchConsulting.aspx	No
Central Michigan University	College of Science and Technology	Research Design, Data Analysis, Interpretation of Results, Data Entry, and Proposal Preparation	Two -- One director and one assistant director	Faculty and Students	SPSS and Minitab	http://www.cst.cmich.edu/scc.html#visitSCC	Limited
Eastern Michigan University	Faculty Development Center	Offers workshops on SPSS for faculty	A director, two associate directors, and three grad assistants	Faculty	SAS, SPSS, Minitab, and Nvivo	http://www.emich.edu/facdev/	No
Illinois State University	Milner Library	Research Design, Data Analysis, Interpretation of Results, Data Entry, and Proposal Preparation	Community of scholars from a myriad of disciplines across the University	Faculty	SPSS and SAS -- not clear who is able to purchase or use though.	http://www.statscenter.ilstu.edu/	No
University of Nebraska	Department of Statistics	Consulting and Help Desk Services	Consortium of faculty and graduate assistants from all over the University	Faculty and Students?	Stata, SAS, SPSS, Ethnograph, Stat/Transfer, AMOS, Atlas-ti, HLM, Mag qda, QSR Merge, Mplus, Nvivo, and N6	http://statistics.unl.edu/Resources/consulting.shtml	Some
Kansas State University	Department of Statistics	Services are unclear on the website.	Full time Statistics Department faculty and staff, and graduate assistants	Unclear on website	SAS and SPSS	http://www.k-state.edu/stats/statistical.lab/consulting.html	Some on IT site

Appendix D: Analyses Requested by Focus Group and Survey Respondents by Packages Supported at KSU

Table 1: Univariate Analyses Supported by KSU Licensed Software

<i>Univariate Statistical Analyses</i>	<i>Package</i>		
<u>Analysis Type</u>	<u>SPSS</u>	<u>SAS</u>	<u>AMOS</u>
Descriptive statistics	Yes	Yes	See SPSS
ANOVA family	Yes	Yes	See SPSS
Regression family	Yes	Yes	Yes.
Student's t-test	Yes	Yes	See SPSS
Pearson's correlation coefficient	Yes	Yes	See SPSS
Survival analysis	Maybe	Yes	See SPSS
Cox regression	Yes	Yes	See SPSS
Spatial statistics	No	Yes	No
Reliability	Yes	Yes	See SPSS
GLM	Yes	Yes	See SPSS
Point-biserial correlation		Yes	See SPSS
Tetrachoric correlations	No	Yes	No
Mixed linear models	Yes	Yes	Yes
Semi variogram analysis / Kriging	No	Yes	No
Meta-analysis	Not directly	Through user created scripts	No
Item Response Theory	Not directly	Through user created scripts	Not directly

Table 2: Nonparametric Analyses Supported by KSU Licensed Software

<i>Non-parametric Statistical Analyses</i>	<i>Package</i>		
<u>Analysis Type</u>	<u>SPSS</u>	<u>SAS</u>	<u>AMOS</u>
Chi-square	Yes	Yes	No
Spearman correlation coefficient	Yes	Yes	No
Mann-Whitney U	Yes	Yes	No
Kruskall-Wallis	Yes	Yes	No
Cohen's kappa	Yes	Yes	No
Komogrov-Smirnov	Yes	Yes	No
Kendall's-tau	Yes	Yes	No
Wilcoxon signed-rank test	Yes	Yes	No
Non-parametric t-test	Yes	Yes	No
Non-parametric regression	Yes	Yes	No
Matching methods	No	Yes	No
Logistic regression	Yes	Yes	No
Functional data-analysis methods	No	Yes	No
Bayesian methods	No	Yes	Yes
Classification and decision trees	No	Yes	No
Bootstrap methods	No	Yes	Yes

Table 3: Multivariate Analyses Supported by KSU Licensed Software

<i>Multivariate Statistical Analyses</i>	<i>Packages</i>		
<u><i>Analysis Type</i></u>	<u><i>SPSS</i></u>	<u><i>SAS</i></u>	<u><i>AMOS</i></u>
Factor analysis / Principal components analysis	Yes	Yes	Yes
MANOVA	Yes	Yes	No
Repeated measures	Yes	Yes	Not directly
Structural equation modeling	See AMOS	Yes	Yes
Cluster analysis	Yes	Yes	Not directly
Discrimant function analysis	Yes	Yes	Not directly
Time series analysis	No	Yes	Not directly
Hierarchical linear modeling	Maybe	Yes	Not directly
Redundancy analysis	Maybe	Yes	Not directly
Canonical correspondence analysis	No	Through user created scripts	Not directly
Longitudinal growth curve analysis	No	Yes	Maybe
Linear growth curve analysis	See AMOS	Yes	Yes
Latent class analysis	See AMOS	Yes	Yes
Exact probability options	No	Yes	No
Decisions trees, rules, networks, fuzzy logic, and other data mining techniques	No	Yes	No
Logit regression	Yes	Yes	No
Probit regression	Yes	Yes	No

Appendix E: Specialty Software Cited (fall, 2008)

Table 1: Specialty Software Cited in Bibliographic Research Databases, 2000 to Present

Software Package	Databases									ISI Citation Indexes (title only)
	<i>EJC</i>	<i>PsycINFO</i>	<i>SocINDEX</i>	<i>Education Research Complete</i>	<i>CINAHL</i>	<i>Medline</i>	<i>INSPEC</i>	<i>GEORE F</i>	<i>Biological Abstracts</i>	
<i>LISREL</i>	421	443	137	126	20	205	117	0	69	31
<i>Mplus</i>	50	72	22	17	12	40	7	0	16	15
<i>Nvivo</i>	98	130	41	32	122	130	11	0	13	8
<i>SAS</i>	3441	3486	1749	1346	337	2778	1791	323	*	361
<i>SPSS</i>	1246	763	163	292	1031	3449	669	12	1023	108

*Not searchable in this database.