

Hospital Image: A Correspondence Analysis Approach

By Rajshekhar Javalgi, Thomas Whipple, Mary McManamon, and Vicki Edick

Today, consumers have numerous options for health care services and providers, and they are actively participating in their health care decisions (Lane and Lindquist 1988). In this competitive environment, health care marketers should be concerned about their institution's positioning and image. With whom do we compete? How do we compare with our competitors? On what dimensions? What strategies should be used to gain a competitive advantage? To help answer these questions, health care marketers should be collecting and analyzing market-based information to obtain consumer-relevant aspects of hospital image. Understanding consumers' perceptions and their evaluation of a hospital's perceived image is essential for the institution's long-term survival and prosperity.

We report the results of an intrasystem hospital image study (e.g., hospital vs. hospital) in which we employed a method of analysis that is new to health care practitioners—correspondence analysis (Nishisato 1980). The method is appealing to health care marketers who want to ask consumers to identify which hospitals they associate with specific programs and services. Consideration of this technique is warranted by marketing applications in other areas and by its relative ease of comprehension and use (Green et. al. 1983; Hoffman and Franke 1986).

Health Care Providers' Image

What is a hospital image? Answers to this question are continually being sought, as "image" is a word that is subject to many interpretations (Mazursky and Jacoby 1986). Kotler and Clarke (1987, p. 62) define it as "the

In today's competitive health care industry, understanding hospital image is becoming increasingly important. The authors employ a method of analysis that is new to hospital image research—correspondence analysis. They use it to assess the images of 16 hospitals in a competitive health care market in terms of their associated features. Strategic implications of the study findings are presented.

sum of beliefs, ideas, and impressions that a person holds of an object." A consumer's image of a hospital is not absolute, but is relative to images of competing hospitals. It is a function of the hospital's strategies, how they are implemented, and how the consumer perceives the organization. A hospital's image may be rather stable across market segments or may vary considerably

(Gensch 1978; Hirschman 1980; Lane and Lindquist 1988; Lindquist 1974-75). It is multidimensional because each health care consumer may associate a number of features with hospitals in a competitive marketplace (e.g., "cancer treatment," "special programs for seniors"). The overall image of competing hospitals may vary because of the different features that health care consumers use to distinguish among them. Also, measuring hospital image poses problems because of the number and complexity of the health care products and services upon which "the image" is based.

Health care consumers draw conclusions about an institution's overall image from impressions they have of the strengths and weaknesses of the hospital's offerings. Images are formed from past experiences, word-of-mouth, and marketing communications. Understanding the features that consumers associate with a hospital can lead to successful image management. As hospitals serve multiple publics, image assessment is important to ensure strong public support, favorable legislation, tax breaks, outside funding, and a sufficient supply of volunteers. Whether the administrators are concerned about relating to prospective or current patients, physicians, employees, volunteers, board of trustees, government agencies, or special interest groups, image management is crucial to the strategic management process (Elbeck 1988).

Support for hospital image formation research is found in the literature (Elbeck 1988). As Smith and Clark (1990, p. 14) state: "The actual image formation process appears to occur inferentially. Attitudes about hospital cost, quality of care, and other matters all are formed from objective cues (from the last experience in or with that hospital) and all are linked to an object (hospital)."

The health care literature also contains studies that identify factors that influence health care facility images. Empirical image studies involving competitive health care market structure analyses are emerging (Fay and Whipple 1984; Javalgi, Rao, and Thomas 1991; Lim and Zallocco 1988; Smith and Clark 1990). In these studies, perceptions provided useful insights into the relative importance of constructs underlying competition and the relative strengths and positionings of competitors. However, the data input requirements of the statistical analyses meant that respondents had the difficult task of rating or ranking all hospitals on a list of hospital attributes or judging directly the similarity or dissimilarity of the hospitals.

Two observations can be drawn from this hospital image literature. First, a well-designed image study can assist in differentiating features of a particular hospital from highly similar features of its competitors. Second, innovative statistical methods are needed that entail simpler data collection tasks and provide a joint graphic display that reveals the structural relationships inherent in the data.

Correspondence Analysis

TABLE I

Contingency Table of Features* by Hospitals**

	CC	GC	GV	LHS	LE	LW	MER	EU	HC	HR	MH	MS	RH	SL	SV	UH
emer	76	17	12	35	94	108	14	49	39	17	43	19	23	13	18	58
hart	260	5	3	15	37	44	8	25	17	22	11	13	6	5	12	66
rehb	156	9	7	25	64	66	17	69	18	12	19	12	14	9	12	44
canc	201	5	3	9	36	29	5	26	14	10	7	12	6	9	4	104
call	44	6	4	24	68	57	13	30	17	5	6	9	9	6	6	31
womn	60	17	15	25	121	60	15	76	47	17	14	18	15	12	12	74
lasr	112	7	6	17	35	27	33	63	36	12	9	21	10	10	8	43
outp	81	29	24	53	146	131	35	91	70	32	27	30	31	26	27	67
docs	220	37	30	36	86	87	35	70	48	37	39	47	47	32	34	123
attn	90	32	26	35	120	101	24	74	56	34	27	32	38	26	26	69
snrs	32	11	8	32	73	82	16	44	18	12	9	11	27	8	8	24
comm	54	15	11	60	126	127	24	47	30	15	13	13	23	12	12	35
tech	298	13	10	17	44	57	16	38	26	14	17	34	19	14	12	105

***Features:**

emer.....expert emergency treatment
hartheart disease prevention and treatment
rehbrehabilitation services
canccancer treatment
callcall-in health information services
womnwomen's health services
lasrlaser surgery
outpoutpatient services
docs.....doctors keep up with medical advances
attnstaff giving personal attention
snrsspecial programs for seniors
comm.....offering community programs
techadvanced technological equipment

****Hospitals:**

CCCleveland Clinic
GCGeauga County Hospital
LHS.....Lake Hospital System
LE.....LakeEast Hospital
LW.....LakeWest Hospital
MER.....Meridia Hospital System
EUMeridia Euclid Hospital
HCMeridia Hillcrest Hospital
HR.....Meridia Huron Road Hospital
MHMetroHealth Medical Center
MSMt. Sinai Hospital
RH.....Richmond Heights
SL.....St. Luke's Hospital
SV.....St. Vincent Charity Hospital
UH.....Unviarsity Hospital

We describe the use of correspondence analysis for analyzing hospital image. The method is sometimes referred to as dual-scaling, homogeneity analysis, canonical scoring, and factorial analysis of correspondence (Carroll, Green, and Schaffer 1986; Hoffman and Franke 1986). In the marketing literature, it is commonly referred to as correspondence analysis (Green et al. 1983).

The technique is an easy-to-interpret perceptual mapping tool that is appropriate for analyzing categorical data. Correspondence analysis is a metric multidimensional scaling method that not only determines that relationships among categorical variables are present, but also reveals how the variables are related. It is analogous to a principal components analysis of rows and columns of a contingency table. We consider correspondence analysis from both a technical and a strategic perspective, but emphasize a conceptual discussion of the technique. A mathematical treatment of this approach is provided by Greenacre (1984) and Hoffman and Franke (1986).

The input to correspondence analysis can be simple binary data, such as "yes/no" responses, that can be aggregated over respondents to form a two-way contingency table of frequencies, as displayed in Table 1. Continuous variables must be converted to discrete form prior to analysis (Devilla and Saporta 1983). Nishisato (1980) discusses correspondence analysis of rank order and paired comparison data. A brief summary, including the limitations of this tool, is presented in the Appendix.

Use of Correspondence Analysis

Clearly, this technique offers an advantage to marketers who want to obtain responses to a survey instrument via telephone interviews. Rather than rating hospitals on evaluative attribute scales, respondents can simply indicate "yes" or "no." In practice, respondents make choices among a set of hospitals that need not be specified. Because of the unconstrained nature of the data, only associations need be denoted.

Given the multivariate nature of the perceptual mapping problem associated with health care institutions, correspondence analysis is appropriate for the analysis of hospitals' images. The data for this mapping technique are collected in the form of a contingency table—attributes (hospital characteristics or features, such as "laser surgery," "staff providing personal attention") by objects (hospitals). The graphic output of correspondence analysis is particularly rich in information that can be used for managerial decision making. It assists a marketer in understanding the relationships among intrasystem competitors and hospital features and in visualizing these relationships in low-dimensional space. Health care marketers can implement this technique with easy-to-use PC-based statistical packages such as the one

used in our study (Smith 1990).

The Study

Lake Hospital System (LHS), a multi-institutional system, completed a corporate reorganization from country to private not-for-profit status in 1985. As part of its new strategic planning process, the hospital system measured hospital image in 1986 and 1988. Initially, image analysis focused on the community's understanding and acceptance of the changes that resulted from the reorganization. Also, research was conducted to "look at specific attitudes" toward various aspects of the system, such as community service, physician quality, and modernization issues. Information derived from these early studies was used to assess the target audience's perception of overall quality and preference for LHS vs. specific intrasystem competitors. Results of the studies were used primarily to develop communications strategies.

The impact of competition on the system became more pronounced by 1990. Increasing penetration into the service area by competitive physicians and services prompted a review of the system's service-line develop-

TABLE 2

Absolute Contributions to Variance by Rows and Columns

Row Names—Features	Factors	
	1	2
Expert emergency treatment	3.2	.3
Heart disease prevention and treatment	21.4	7.5
Rehabilitation services	.9	3.8
Cancer treatment	18.8	1.3
Call-in health information service	1.9	8.9
Women's health services	3.1	1.7
Laser surgery	.8	7.4
Outpatient services	8.6	1.7
Doctors who keep up with medical advances	.7	25.0
Staff giving you personal attention	4.3	11.2
Special programs for seniors	6.6	5.3
Offering community programs	9.9	25.8
Advanced technological equipment	19.7	.0
Totals	100.0	100.0
Column Names—Hospitals	Factors	
	1	2
Cleveland Clinic	60.4	5.1
Geauga County Hospital	1.1	6.6
Geneva Hospital	1.0	8.0
Lake Hospital System	4.4	11.0
LakeEast Hospital	11.5	9.0
LakeWest Hospital	8.1	22.7
Meridia Hospital System	.7	1.7
Meridia Euclid Hospital	1.9	1.7
Meridia Hillcrest Hospital	1.9	7.2
Meridia Huron Road Hospital	0.0	3.0
MetroHealth Medical Center	.3	2.4
Mt. Sinai Hospital	.1	2.4
Richmond Heights Hospital	1.7	1.9
St. Luke's Hospital	.3	5.6
St. Vincent Charity Hospital	.3	3.7
University Hospitals	6.2	2.1
Totals	100.0	100.0

ment and subsequent communications strategies. Image research objectives were developed to include "assess the images of Lake Hospital System's two hospitals (LakeEast and LakeWest) vs. its competitors' images through the measurement of associated features." The features represented programs and services offered by competing hospitals as well as those preferred by consumers, as evidenced by literature reviews and previous research. The features are listed in Table 1.

Research Design

The research design for this hospital image study was implemented in two phases. In the first phase, the task was to develop a questionnaire that was based on the results of exploratory research (e.g., focus groups), an analysis of competitors' services, and a review of relevant literature (Berkowitz and Flexner 1981; Boscarino and Steiber 1982; Lane and Lindquist 1988). The questionnaire was pretested and minor modifications were incorporated into the final version.

The second phase of the research design consisted of random sampling and random-digit-dialing telephone interviewing. A single-stage, stratified, proportional random sampling plan was developed. A computer program generated a listing of telephone numbers in the county, proportional to the household population in each of the six Zip code areas. Interviews were completed by a professional field interviewing service from its supervised telephone facility. To reduce potential errors due to nonresponse, selection, and interviewer bias, the following fieldwork standards were implemented:

- Interviews were conducted during daytime, evening hours, and on weekends.
- Up to three callback attempts were made to no-answer and busy numbers at different times.
- Business numbers and numbers not in service were excluded.
- Ten percent of the completed interviews were validated.

After elimination of 909 business numbers and numbers not in service, attempts were made to contact 1,494 households; approximately one-third of the calls were made in the evening and on weekends. Callback attempts were made at different times and on different days. The contact rate was 65%. After health care professionals who were contacted had been disqualified, 57% of the qualified people completed the interview—82% of the first two attempted calls. Approximately one-half of the interviews were completed during the evening and on weekends. The completion rate varied only slightly across the six Zip code areas. This sampling procedure produced completed interviews with 503 geographically dispersed respondents, who were proportionally representative of the Zip code areas.

Respondents were requested to provide information on the association between the 13 features in Table 1 and hospitals in the market area. To elicit this information, the interviewer said: "The hospitals in Northeast Ohio have different characteristics. I'd like to read you a list of hospital features and for each one, please tell me which hospitals have this characteristic. Which hospitals do

you associate with (e.g., special programs for seniors)? Any other hospitals?" Interviewers were instructed to start with a different feature for each respondent, thus eliminating order effects. This information, whether a hospital is associated with a feature or not (binary data), became the input to correspondence analysis. Other sections of the questionnaire sought data on health information awareness, advertising recall, and demographic characteristics.

Results

Table 1 is a contingency table of 13 features (rows) and 16 hospitals (columns). The numbers in the cells are raw counts that become input to correspondence analysis. The number in the second row and first column indicates that the Cleveland Clinic was considered a place for "heart disease prevention and treatment" by 260 respondents. This frequency is 47.4% of the total "heart disease" associations (549, row total), but only 15.4% of all associations to the Cleveland Clinic (1,684, column total). The other raw counts in Table 1 can be interpreted similarly. In the correspondence analysis algorithm, the raw counts are converted to relative frequencies with respect to both row and column totals. The relative frequencies, not the raw counts, are dual-scaled.

The eigenvalues generated are interpreted analogously to those obtained in factor analysis because the correspondence analysis algorithm employs a principal components analysis. An eigenvalue indicates the amount of variance accounted for by a factor. Each factor represents an underlying dimension that accounts for the original variables used to generate that dimension. The first two eigenvalues produced by correspondence analysis of Table 1 data account for 82% of the variance—71% and 11%, respectively. An additional dimension adds only 6.6% in explained variance. It seems clear that the correspondence problem can be reduced to a two-dimensional map by sacrificing only a small amount of the explained variance. Therefore, for the sake of interpretability, the two-dimensional map in Figure 1 was used in our study.

One of the key statistics provided by correspondence analysis is absolute contributions to variance (Table 2). Though the attributes (features) are considered as rows and the objects (hospitals) as columns, interpretation of the information contained in each of the two portions of Table 2 is the same. Therefore, without loss of generality, we confine this portion of the interpretation to the features (the upper half of Table 2).

These statistics indicate the percentage of variance explained by each feature in relation to each of the axes (principal components). They can be used to assist in interpreting the principal components generated (see Hoffman and Franke 1986). The larger the absolute contribution of a feature to a principal component, the more important that feature is in determining the direction of the axis.

As shown in Table 2, the first dimension, factor 1, appears to be explained primarily by the features "heart disease prevention and treatment," "cancer treatment," and "advanced technological equipment," with respect

tive absolute contributions to the first dimension of 21.4%, 18.8%, and 19.7%. These features represent 60% of the variance explained by the first dimension (71%) or 43% of the total variance. "Doctors who keep up with medical advances" and "offering community programs such as support groups, classes, and health screenings," account for more than half (51%) of the variance explained by factor 2 (11%), or 5% of the total variance.

Two-Dimensional Graphic Display

Interpretation of the statistical output generated by correspondence analysis is not complete without discussion of the joint graphic display. The two dimensions of the map, labeled factor 1 and factor 2 in Figure 1, correspond to the two principal components in Table 2. Because correspondence analysis scales the rows and columns of the input data matrix in corresponding units, the algorithm provides a joint graphic representation of the features and hospitals in a two-dimensional space. Interpretation of the map involves the notion of proximities among the rows and columns of the contingency table; categories (features and hospitals) having the greatest proximity are those most similar in terms of the underlying structure.

This representation is strategically important to health care marketers as the map reveals the underlying structure and the positioning of features and hospitals. Marketers can clearly identify the relative positions of hospitals and features by visual examination of the location of the points in the joint space. Interpretation of this map is based on the relative frequency of association between features and hospitals, not the absolute frequency counts.

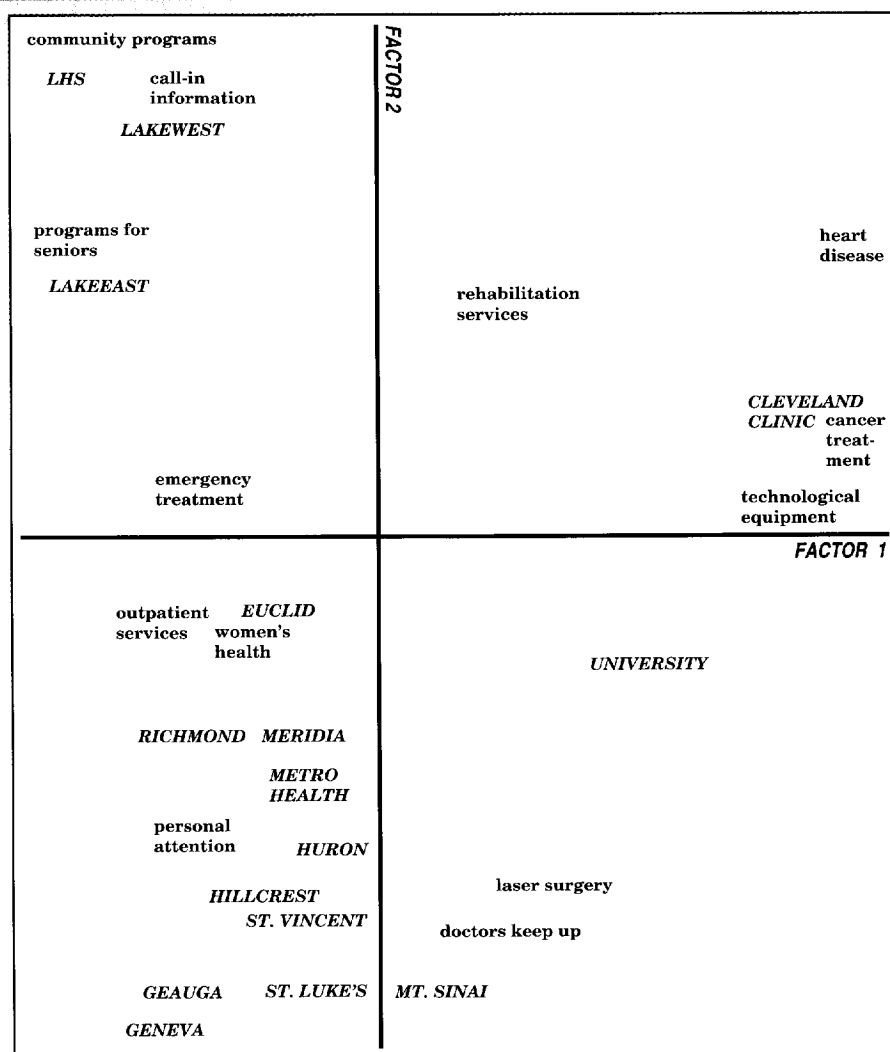
From this image map, which shows the correspondence between the 13 features and the 16 hospitals (Figure 1), one can glean interesting information. The Cleveland Clinic is most closely associated with "cancer treatment," "heart disease prevention and treatment," and "having advanced technological equipment." Though University Hospitals also has a "high tech" image, it does not project as distinctive an image as does the Cleveland Clinic.

Figure 1 also affords important insights about the Meridia Health System hospitals (Euclid, Huron Road, and Hillcrest), Mt. Sinai, Richmond Heights, St. Vincent Charity, St. Luke's, Geauga, and MetroHealth System. These hospitals are positioned in the lower-left quadrant of the map. Meridia

member hospitals are closely associated, but their image as a system is not distinct from the images of MetroHealth System, Richmond Heights, and St. Vincent Charity. Clearly, Euclid has the most distinctive image, being associated with "outpatient services" and "women's health services." "Staff giving you personal attention" is common to the image of most of the hospitals in this quadrant. "Laser surgery," a common theme of Meridia advertising, apparently has not differentiated the Meridia Health System from other hospitals. Mt. Sinai, however, is differentiated from Meridia by being associated with "doctors who keep up with medical advances."

The two hospitals of Lake Hospital System (LHS), LakeEast and LakeWest, are perceived as a cohesive health care system with a distinctive image. Positioned in the upper-left quadrant of the map, LHS is associated closely with "offering community programs, such as support groups, classes, and health screenings." LakeEast is associated most closely with "special programs for seniors"; LakeWest, in contrast, is known primarily for "having a call-in health information service,

FIGURE 1
Image Map



including physician referrals." Lake Hospital System is not associated with the highly technical hospital features that differentiate the Cleveland Clinic and University Hospitals from the others. Also, LHS and its associated programs and services are perceived as distinctive in comparison with the Meridia Health System and the other hospitals included in this image study.

Strategic Implications

The results of the image study provided LHS planners the market information necessary to assess the hospitals' competitive positions by comparing consumer perceptions with the results of an internal analysis of clinical strengths and weaknesses. LHS planners were thus in a better position to determine what services would benefit from product-line expansion or market development and were better able to develop appropriate communications strategies.

The perceptual image map produced by correspondence analysis (Figure 1) enabled LHS to compare its internal clinical skill level with its external image in relation to other health care providers. To improve its competitive position in the marketplace, LHS planners and key decision makers modified current offerings, planned new programs, and strengthened communications.

Offensive strategies were developed for areas identified as internal clinical strengths. For clinically strong LHS programs and services not closely associated with Lake Hospital System (e.g., "rehabilitation services such as physical therapy, work injuries, and sports medicine"), competitors' weaknesses were exploited. For example, the LHS physical medicine product line expanded its market reach through sales efforts to employers and third-party payors, while strengthening communications through direct mail and educational programming for physicians and consumers.

For clinically strong LHS programs and services that did have a distinctive external image associated with LHS (e.g., "special programs for seniors"), new markets were created and communication activities were increased. For example, a membership program was developed to capture a greater percentage of the over-65 population. Market development efforts expanded the use of programs offered by LHS and thereby created greater potential for new offerings.

To reduce the likelihood of losing business to competitors in areas of clinical weakness, LHS undertook defensive measures. Services associated strongly with other hospitals that needed either improvement or further assessment at LHS were identified and compared with those of the competitors. These services included "cancer treatment," "women's health services," and "outpatient services." Defensive strategies were developed to strengthen the product lines prior to any communications activity. Cooperative, joint-venture arrangements with other hospitals have been planned for most of these services in conjunction with efforts to disperse services geographically.

LHS is viewed externally as a hospital system that is known more for "offering community programs" than for its use of "advanced technological equipment."

Ironically, more internal resources had been expended to implement strategies to increase technological capabilities than to develop community outreach. Clearly, due to the consumers' apparent lack of information about LHS's new technological capabilities, strategic communications programs had to be redefined to establish a multimedia approach. Implementation of the revised communications strategy included newspaper advertising, direct mail, speaker's bureau engagements, and community open-houses. Responsiveness to the local community had been considered internally by LHS managers as an area in need of improvement. However, according to the image analysis, this clinical weakness is viewed as an area of strength by the public. As a response to the research findings, the strategic plan outlined a detailed strategy to position LHS in a leadership role by initiating cooperative planning with area agencies and businesses. Overall, these efforts contributed significantly to LHS being able to live up to its image and to have clearer positioning strategies for the health care marketplace.

Conclusion

The results of our study demonstrate the suitability of using correspondence analysis in assessing hospital image. Correspondence analysis enabled LHS planners to visualize their hospitals' comparative advantages and disadvantages in relation to their competitors' positions of strength and weakness. This market-based information was crucial to strategy development as it helped marketers to best represent their hospital system in the minds of health care consumers. The same approach could be applied to develop positioning and marketing strategies for providers of long-term care, ambulatory care, and home health care, among others. In addition to image analysis, correspondence analysis can be used by health care industry marketers in redesigning specific programs and services, in introducing new service concepts, and in the design phase of the new product development process. Such an analysis could afford an institution a competitive advantage in today's rapidly changing environment.

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Appendix

Summary of Correspondence Analysis

Data Input

The method is most suited to research situations in which marketers can collect "yes/no" categorical data quickly and easily (e.g., telephone interviews). If any variables are continuous, they must be converted to a discrete form.

Technical Description

Correspondence analysis is a singular value decomposition of a matrix of chi-square distances. The decomposition produces a set of matrices (eigenvalues and eigenvectors) that are applied to row and column distance matrices to produce the interpoint distances for correspondence analysis mapping (Smith 1990). The algorithm derives interpoint distances between the row and column categories so that the numerical scores assigned to the rows and columns of a data matrix maximize their interrelationships. "Correspondence analysis" refers to the fact that the row and column scores are reported in corresponding units. Similar to principal components analysis, correspondence analysis produces graphs that represent the configuration of points in projection planes formed by principal axes taken two at a time. Each of the principal axes is associated with an eigenstructure that defines the projections on the axes, as well as the relative variance in the points explained by the axes.

Output

Correspondence analysis computer routines provide several key statistics for the attributes and objects being studied. Among these are the absolute and relative contributions to inertia of each attribute and each object (Table 2). This information is useful in determining the relative importance of attributes. In addition, correspondence analysis programs present a graphic display of the relative positions of attributes and objects in the same low-dimensional joint space map. Figure 1 is a graphic representation of both the rows and columns of Table 1 in terms of the first two factors. This map can be interpreted as a point-point model.

Interpretation of Output

Interpretation of correspondence analysis is remarkably like that of principal components analysis due to the similarity of the algorithms. Interpretation of results involves the examination of the eigenvalues associated with each of the principal axes. Coordinates and contributions of the principal axes for the row and column points are produced for interpretation, as are relative frequencies and distances

between the points and the origin of the axes (Smith 1990).

Relationship to Other Multivariate Techniques

Some of the more popularly used perceptual mapping techniques (e.g., factor analysis, discriminant analysis) cannot handle categorical data without violating their statistical assumptions. Hoffman and Franke (1986, p. 213) note that "these methods have little applicability to the categorical data that arise in many marketing research applications." Discriminant analysis and some multidimensional scaling techniques also lack the ability to generate the joint graphic display.

Furthermore, Hoffman and Franke (1986, p. 213) note that "a distinct advantage of correspondence analysis over other methods yielding joint graphical displays is that it produces two dual displays whose row and column geometries have similar interpretations, facilitating analysis and detection of relationships." In other approaches to graphic data representation, this duality is not present. Another advantage is that a joint graphic display is obtained without subjecting respondents to the cognitive burden of rating similarities. In practical terms, the resulting map can assist managers in detecting structural relationships among "rows and columns" that have similar interpretations in the attributes by objects matrix.

Limitations

Correspondence analysis is a multivariate, descriptive statistical technique not well suited for hypothesis testing. There is no procedure for determining the appropriate number of dimensions to display. However, eigenvalues are available to determine the amount of variance explained. As with other multivariate methods, parsimony must be balanced against interpretability in determining the number of dimensions to interpret (Hoffman and Franke 1986).

Availability of Software Packages

Two PC-based software packages, CORAN and CORRESP, are available to users from Smith (1990). A third one, CORANA, is available from Saxe Research (1991). Jambu and Lebeaux (1983) provide a collection of computer programs for correspondence analysis and related multivariate methods.

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10. Extent and Nature of Circulation:

	Average no. copies each issue during preceding 12 months	Actual no. copies of single issue published nearest to filing date
A. Total No. Copies (Net Press Run)	5,072	5,388
B. Paid and/or Requested Circulation		
1. Sales through dealers and carriers, street vendors, and counter sales	20	0
2. Mail subscriptions (Paid and/or requested)	4,416	4,409
C. Total Paid and/or Requested Circulation (sum of 10B1 and 10B2)	4,436	4,409
D. Free Distribution by Mail, Carrier, or Other Means Samples, Complimentary, and Other Free Copies	508	763
E. Total Distribution (Sum of C and D)	4,944	5,172
F. Copies Not Distributed		
1. Office use, left over, unaccounted, spoiled after printing	128	216
2. Returns from news agents	—	—
G. TOTAL (Sum of E, F1 and 2-Should equal net press run shown in A)	5,072	5,388

11. I certify that the statements made by me above are correct and complete. Signature and title of editor, publisher, business manager, or owner: Thomas E. Caruso, Executive Editor