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Quirk's
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Review

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Features

Departments

Keep
the
kids
interested

A computer-assisted interviewing system lets the Youthwear Division of Levi Strauss & Co. hold the attention of young respondents

by Joseph Rydholm/managing editor

They say necessity is the mother of invention. Well, how's this for necessity: to meet your research project's goals, you'll need the undivided attention of boys between the ages of 9 and 14 as they go through a 30-45 minute interview covering several topics. Eventually you want to make these interviews the core of a tracking program. You think computer-aided interviewing is the way to go but you want to do the interviews using mall intercepts in markets across the country and the interviewers in those mall facilities have differing levels of comfort with computers.

Those were just some of the issues facing the Youthwear Division of Levi Strauss & Co. and its research "partners", Touchstone Research and Analytical Computer Software, Inc. (ACS), over a year ago when development began on a tracking study of the youth market.

"We had been working with Levi's in tracking trends in the youth segment in the fashion related category for some time and the interview was getting more and more comprehensive and time consuming," says Steve Burch, president of Touchstone Research, Branford, Conn. "So we were looking for a way to get quite a bit of information while maintaining the integrity and accuracy of the data and the involvement and attention of the kids. Levi's wanted to both improve the procedure from a research perspective and make it a more positive experience for the kids."

After abandoning the idea of building a system from the ground up Touchstone and Levi's turned to Analytical Computer Software and used its computer-assisted interviewing program ACS-Query Solo as a foundation for inventing a system that met their needs.

"We were able to put a process into the interview so that the computer was being used in a way that wasn't simply obtaining answers but was in a format friendly for the kids," Burch says. "We developed a system that incorporated ACS software and an interview format that used both an interviewer entering data and also a segment where the children would interact with the computer. In addition we developed a videotape that explained the interview format, the purpose of the interview, and instructed the children in the use of a computer. ACS had a very creative approach and they understood what our needs were and what we were trying to do."

Accurate data

Maggie Celestini, senior analyst in Levi Strauss & Co.'s Youthwear Division, says that the system helps the clothing firm get the most accurate data that it can. "Not that we weren't before, but technology changes, and for us this is a better way. We want to be state of the art and do the best research we can. Previously, one-on-one was the only way to go in mall intercepts. But now technology has improved.

"We used to use one-on-one surveys and we felt that boys might be a little hesitant to open up or might not tell us the exact truth. We felt that this new method would be the most accurate way of getting their true feelings, that they could be direct if they were interacting with a computer."

Another advantage, Celestini says, is continuity. "We do the interviews in several different markets and because of differences in interviewer quality when you do one-on-ones you can't always have that continuity. But with this method we feel we're getting it."

The interview covers typical subjects, including brand and product imagery, and fashion trends, and uses a videotape portion to allow for gathering of impressions of commercials.

Practice questions

The system was made "kid friendly" by using colors and sounds, for example, to guide the respondents through the interview and explain the scale they would use to indicate their feelings. Practice questions on topics such as favorite music group and favorite color help accustom them to the system. The interview also contains brief entertainment sections to give the boys a break from the questioning process, says Amy Yoffie, vice president, Westfield, New Jersey-based Analytical Computer Software.

"We spent a lot of time making it colorful and thinking of ways to make the screen display interesting. The interviewer asks questions initially, then the software instructs them when to turn it over to the kids. The interviewer stays there while they do the first screen and then once the child seems to be comfortable they can walk away. Once that section is over the child is instructed to go and get the interviewer."

Mall personnel comfortable

In addition to making sure that the respondents are comfortable using a computer, it is also important that the mall personnel who administer the surveys and work with the system are comfortable with computers. To that end, ACS and Touchstone developed a handbook for the mall personnel that gives simple instructions on everything from starting the system each day to transmitting data via modem.

"Until you've had experience with all the difficulties that can be encountered it's very difficult to anticipate the types of problems that can crop up," Burch says. "The handbook explains the procedures to the field in a way that makes it relatively fail-safe for them. You still have to do some monitoring and train-

Automating market

Canadian firm uses classification tree software to

by Barry de Ville

Editor's note: Barry de Ville is a founder of FirstMark Technologies Ltd., Ottawa, Ontario.

Market Facts of Canada Limited is like any other business in the intensely competitive 1990s: its number one priority is not just to hang onto its customer base but to develop it as well. This means continuously looking for ways to increase its productivity and the value it delivers to its customers. This has led the company to explore the promise of relatively new PC-based software for data analysis and market segmentation—classification trees[1].

Classification tree software scans through survey-type data sets to automatically identify the key multi-dimensional attributes that define a customer segment. These products are highly interactive, and, as Market Facts has found out, highly productive[2]. Hierarchies of customer groupings are displayed, in summary form, as classification trees. These trees provide a graphic summary of the results that is rapidly understood and easily communicated to non-statisticians.

Figure 1 displays results that were produced by Dr. John Liefeld from the Dept. of Consumer Studies at the University of Guelph while on special assignment to Market Facts of Toronto. He performed a market segmentation analysis on the Market Facts' Household Flow of Funds survey. He was specifically interested in comparing classification tree methods and traditional market segmentation approaches based on crosstabulations.

He first extracted the relevant fields of information that could be used to characterize a market segment, starting with ownership of Canada Savings Bonds (CSBs), Retirement Savings Plans (RSPs) and Master Card ownerships. He selected CSB ownership to serve as the dependent variable in the analysis. As independent variables, used to form the characteristics of the market segments, he chose the following: household income, region of residence, population density, type of dwelling, ownership of residence, number of people in the household, language, gender, marital status, age, education, occupation, and membership in one of thirteen specially-constructed lifestyle segments (these are proprietary data constructs used by Market Facts to profile consumer habits).

Using the SAS statistical package to conduct a traditional crosstabulation analysis, Liefeld found that all thirteen independent variables were statistically significant. "The segmentation analyst's quandary is that this analysis is not parsimonious," Liefeld says. "It suggests that all independent variables are important in determining segment membership. It does not reveal which independent variables are more important or meaningful than others. It does not reveal which combinations of socio-demographic characteristics combine to define different segments of ownership of CSBs."

A parsimonious analysis

To answer the knotty questions about variable importance and variable combinations, Liefeld turned to classification tree methods. "A (classification tree) segmentation analysis whittled down CSB ownership to five variables. It revealed that household income is the most powerful predictor of who was likely to own a CSB: ownership is highest when household income is $50,000 or more (54% here owned CSBs) and is least for those with household income under $25,000. When household income is greater than $50,000 the second best predictor variable is Region. For household income less than $50,000, language (English or French) is the second best predictor variable," Liefeld says.

These results are illustrated in Figure 1. It shows how Canada Savings Bond ownership varies primarily as a function of Household Income. Notice how the first branch of the classification tree shows the optimal clustering of income values to form the branches of the tree. This clustering is performed automatically using statistical measures of association (either X^2 in the case of a categorical dependent variable—as shown here—or the F-test in the case of a continuous dependent variable[3]). The clustering has the effect of forming groups of codes which are as alike as possible yet which are as maximally distinguished from the other groups of

segmentation

identify bond owners

codes, or nodes, at the same level of the classification tree.

The automatic grouping of codes on the branches of the classification tree is one of the most important benefits of these software packages. Not only does the software save time in looking through many relationships—and collapsing similar values together automatically—but, Liefeld says, the results are "more informative, parsimonious and reliable than those arrived at using bivariate crosstabulation analysis."

Multi-way hierarehies

Classification trees go beyond bivariate relationships, however: as can be seen in Figure 1, they produce multiway hierarchical relationships. At each stage in growing the tree the analyst has the opportunity of interactively picking the best split variable. In this example Liefeld chose income. Once this is done the software descends to the next node and applies the tree growing process again. This gives rise to the inverted tree structure that characterizes this technique.

The final result is a classification tree that contains multi-dimensional effects —including combinations of variable interactions— but which are displayed as a tree rather than as a vector of

coefficients, for example, as is usually the case with traditional multiple dimension techniques. Each branch on the classification tree can be interpreted as a series of nested tables.

Gains charts

In many cases the analysis could stop

Figure 1: Key Demographic Splits for Canada Savings Bond Ownership
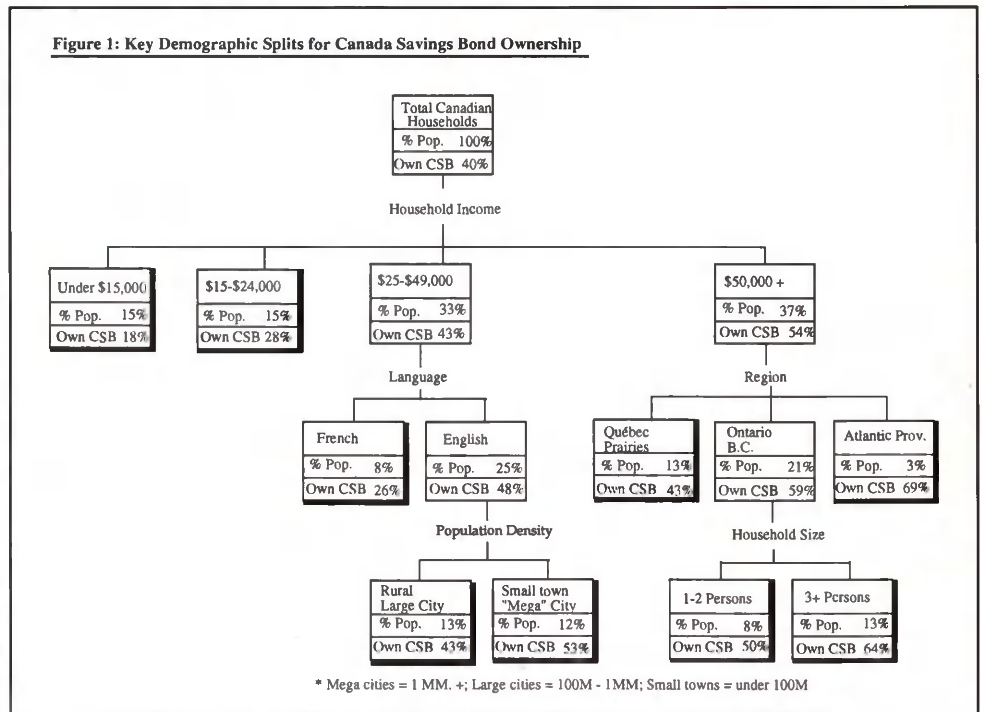
there: each of the bottom nodes of the classification tree are taken to form a unique market segment, each one deserving (or requiring) special treatment in sales, marketing and advertising campaigns. However, as Peter Greensmith, senior vice president of research and

marketing at Market Facts, says, "generally speaking, when segmenting markets...it is not only important to isolate the significant variable splits but also to make a judgement on the level of segmentation detail that has practical utility. For example, segments representing only a small percentage of the

total market may not have practical value." Greensmith has found that a gains chart, illustrated in Figure 2, is well-received by clients in order to assess the potential value of each segment

DATA USE
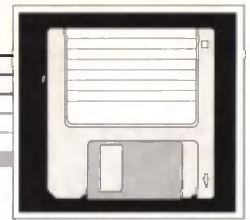
Appropriate use of regression in customer satisfaction analyses: a response to William McLauchlan

By Doug Grisaffe

Editor's note: Doug Grisaffe, Pd.D., is senior research associate with Walker:CSM, Indianapolis, Indiana.

In the October 1992 issue of *Quirk's Marketing Research Review*, Dr. William McLauchlan presents a critique of the use of multiple regression analysis to model customer satisfaction (McLauchlan, 1992a). He argues that using regression to study determinants of satisfaction is, "fraught with both mathematical and philosophical dangers" (p.10). However, it is my contention that, when properly applied, regression analysis is an excellent tool for use in customer satisfaction measurement (CSM) research. In fact, given the management objectives of CSM, multiple regression is a more desirable approach than the self-stated-importance approach advocated by Dr. McLauchlan. To support this position, I critique several points from his article, interspersing other relevant information about multiple regression along the way.

Dr. McLauchlan's hypothetical data

The hypothetical data Dr. McLauchlan uses to criticize regression are re-presented in Table 1. There are some characteristics of this hypothetical data set that should be pointed out. First, note that attribute B has no variation. Finding such an attribute in a real CSM data set would be a rarity. Naturally occurring individual differences in perception will lead to at least some variation in CSM measures. A second thing to note is the pattern of correlations for the hypothetical data. These correlations are also presented in Table 1. Note that attribute C correlates more highly with another attribute than it does with the overall satisfaction measure.

Dr. McLauchlan has illustrated the phenomenon known as "net suppression," a particular kind of suppression effect

(Cohen and Cohen, 1978). Net suppression occurs when a predictor correlates with the dependent variable of interest, but to a lesser degree than it does with other predictors in the model. The phenomenon produces a regression coefficient with the "wrong" sign (and other coefficients with inflated magnitudes). Should the fact that suppression effects can occur in regression analysis cause us to throw out multiple regression as a CSM tool? I don't think so.

TABLE 1
Dr. McLauchlan's Data Scenario

1. Raw Data

Overall Satisfaction	Attribute Satisfaction		
	A	B	C
7	8	8	7
8	9	8	5
6	7	8	5
9	8	8	4
4	4	8	3
9	9	8	8

2. Stated Importance

	A	B	C
	5	9	7

3. Correlations

	A	C
Overall Satisfaction	.91	.54
A		.69

Statistical output will be only as good as the numbers that enter into it. It is true that problems like those described by Dr. McLauchlan might occur if a CSM researcher were to use post hoc statistical "fishing" to find the "right" regression

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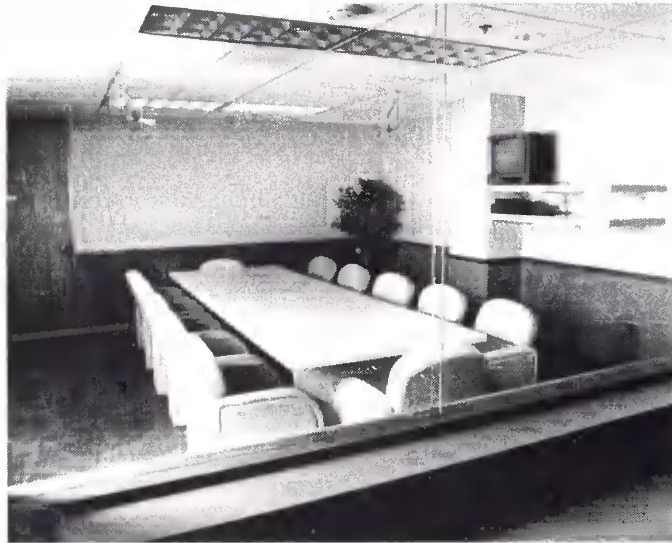
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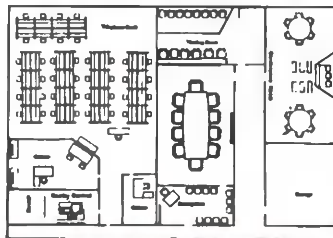
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model (e.g., stepwise regression), particularly if the modeling involved large numbers of redundant attributes as predictors. However, if a regression model has been specified correctly, a priori, with a parsimonious set of relatively distinct determinant attributes, each predictor should be more related to what it determines than to the other predictors. With sound research practices of that sort, suppression effects will be avoided.

Therefore, I contend that the problems Dr. McLauchlan demonstrates certainly may be avoided with application of a priori knowledge and sound research design. Later, I will have more to say about design issues.

Nonsignificant attributes with high stated importance

Dr. McLauchlan uses his hypothetical data to discuss an attribute having high stated importance, but a regression coefficient that is nonsignificant (nonexistent in his scenario). First, it should be noted that he provides arbitrary stated importances for the attributes in his example. They have no tangible link to the other hypothetical data.

Second, he proceeds to say that, based on regression, resources might be allocated away from that attribute. He notes how risky this would be given the high stated importance. But based upon regression, would resources really be allocated away from such an attribute? Not necessarily.

Consider the classic example of airline safety. When asked, most consumers would probably give very high importance ratings to safety. However, it would probably not be a significant predictor of airline choice. It is more of a

minimum requirement, something that is expected and important but, does not contribute significantly to the prediction of choice as long as it exists to the necessary degree. Should we therefore take resources away from safety? No. It will be best to maintain current levels of performance, knowing that with less resources, performance could drop. As Dr. McLauchlan points out, this drop in performance could cause the attribute to become a differentiating factor, on which we would then have lower scores.

Therefore, the concern that Dr. McLauchlan points out is not an inherent problem with multiple regression as a CSM tool. Rather, it is an issue of correct managerial interpretation. Whether a measure of stated importance would be high or low, a nonsignificant regression coefficient should not be treated as a rote prescription for taking away resources. Usually in CSM work, the relative level of performance on an attribute moderates the interpretation of regression's information about significance as it applies to subsequent resource allocation.

Stated importance versus "derived importance"

The previous section points out that the degree of stated importance rated directly by respondents may not agree with what has traditionally been called "derived importance" (i.e., the degree of impact as identified by some statistical approach like multiple regression. I think the terms "determinance" or "impact" are more correct than "derived importance", but to be consistent with other literature I will use the derived importance label). This possible lack of agreement among the two approaches was implicit in Dr. McLauchlan's example of high stated importance and low (no) derived importance.

Given that the two approaches to importance can produce different outcomes, four possible combinations of stated and derived importance outcomes are presented in Figure 1. Dr. McLauchlan has discussed one cell of this table. To expand on this we must consider the other three possibilities.

There are two cells of the figure that show agreement between the two methodologies, and two cells of the figure that show a lack of agreement between methodologies. I have already dealt with cell 4 in discussing Dr. McLauchlan's example. Cells 2 and 3 pose no major source of conflict. The two approaches are in agreement, and with the exception of differences in degree and rank order of impact or importance, there is no disagreement about what is "important" and what isn't. That only leaves cell 1, where self-stated importance is low but regression's predictive impact is high.

FIGURE 1
Four Possible Combinations of
Stated and Derived Importance

Derived	Hi	1	2
Importance	Lo	3	4
		Lo	Hi
		Self-stated Importance	

To consider cell 1, I borrow from some other writing of Dr. McLauchlan. In a paper presented at the recent Sawtooth
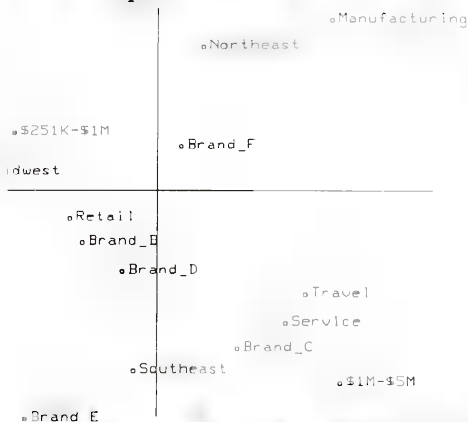
Software Conference (McLauchlan, 1992b) he reasoned why derived importance based on multivariate techniques, including multiple regression, may produce better information than stated importance ratings if the context of the research involves strong image dimensions.

For example, consider a case where a sample of young urban professionals have rated post-purchase satisfaction with their BMW. Assume one of the attributes dealt with the "image" given off by driving a BMW. It is likely that many would not admit, in a self-stated importance task, that this image highly contributed to their purchase decision and subsequent satisfaction. However, in a correctly specified regression analysis, it is quite likely that such an attribute would have a large and significant regression coefficient.

As Dr. McLauchlan (1992b) has hypothesized, it is likely that the context of the research will point to the optimal method of arriving at "importance," and that there may be different methodologies that are more and less applicable to various research contexts. Given that, and given that this article aims at the specific context of CSM research, the next logical question is "which approach is best for CSM work"? Contrary to Dr. McLauchlan's position, I argue that "derived importance" is optimal for the quantitative components of CSM research because it fits CSM theories and management goals.

Regression fits CSM theories and management goals

One of the central ideas in CSM research is that retention of customers, and hence financial performance, is related to certain global attitudes/perceptions of products and services (overall quality, overall satisfaction, etc.). These global overall perceptions are a function of more specific, fine-grained perceptions. Typically, the more fine-grained components are measured as detailed attributes of products and services. The global measures are thought to be formed by respondents through some form of "cognitive algebra" where perceptions of the specific attributes are mentally "put together" to form the global perception. A basic representation of these ideas is given in Figure 2.

FIGURE 2
A Basic Conceptual Framework for CSM

specific	overall	customer	financial
attribute —>	perceptions —>	retention —>	outcomes
perceptions			
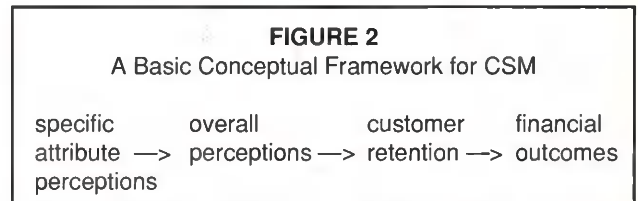
Given this basic framework, CSM researchers are interested in finding ways to increase scores on the overall measures. Higher overall scores imply that customers are more pleased with products and services, and hence more likely to remain as customers and generate revenue. Many corporations understand these principles, and are so committed to them that they financially reward employees who can bring about quantifiable gains in CSM measures.

What will be the most effective approach to influencing the overall measures? If we knew the "formula" that customers

used to "put together" attribute ratings to arrive at their overall ratings, we could simply find those attributes that contributed the most. By making improvements on those actionable attributes with the biggest impact, we could optimize gains on the overall measures. But how can we find the formula that best captures how attributes are "put together?" Further, how can we make sure that no other formula will better explain the process?

Multiple regression is exactly what is needed. The technique provides a model of how the attributes get "put together." The regression equation combines all of the attributes into a single new measure which is as close as possible to the overall measure of interest. So, given the theoretical framework and the goals of management, the conceptual logic of multiple regression makes it highly appropriate as a statistical technique for modeling overall CSM measures.

Benefits of regression's best fit

Given the theoretical logic of attributes combining to form the overall rating, multiple regression provides a model of how the attributes get "put together". All other things being equal, making changes in those attributes will have specific quantified effects on the overall rating. No other model provides better explanation of the overall measure. To demonstrate this, consider the hypothetical data presented in Table 2.

TABLE 2				
Example Data Set				
	OVERALL	Attribute 1	Attribute 2	Attribute 3
Respondent 1	4	3	5	4
Respondent 2	3	1	2	1
Respondent 3	4	5	1	3
Respondent 4	4	1	2	5
Respondent 5	4	3	5	2

Let us try various ways of combining the attributes to form the overall measure. It might be reasonable to think that respondents "mentally average" their perceptions of the attributes to arrive at their overall rating. This implies an equally-weighted average. With three attributes, each contributes one-third to the overall measure. The algebraic expression of this notion is demonstrated as follows:

MODEL 1. Equally weighted average:

Overall = .33*A1 + .33*A2 + .33*A3

A second model to consider, Model 2, expresses the notion that an averaging process still takes place in the minds of respondents, but that the attributes are weighted differently. For this example, the first attribute is given twice the weight of the other 2 attributes. The algebraic expression of this is:

MODEL 2. Differentially weighted average where Attribute 1 has 2 times the impact of the other two attributes:

Overall = .50*A1 + .25*A2 + .25*A3

A third model to consider, Model 3, expresses an unequally weighted combination where the "rule" for combining comes from multiple regression analysis. The equation is:

MODEL 3. Unstandardized regression model:

Overall = 2.61 + .14*A1 + .07*A2 + .20*A3

Table 3 summarizes the predictive accuracy of these three models. In addition, a very small constant (.02) was added and subtracted from the regression weights just to demonstrate that even minor changes in regression weights lead to worse prediction.

TABLE 3.	
A Summary of Predictive Accuracy for Three Different Models	
SOURCE OF WEIGHTS	PREDICTION ERROR
• multiple regression	.10
• regression weights + .02	.24
• regression weights - .02	.29
• equally weighted average	6.23
• differentially weighted average	7.00

The conclusion from this demonstration is that no other way of deriving a weighting system for "putting together" the attributes will work as well as multiple regression's equation. Further, given that the equation has been correctly specified, increasing scores on the attribute with the biggest regression weight will produce the biggest gain in the overall measure.

Given CSM's theoretical framework and management goals, and what regression has to offer in light of them, we might ask how stated importance compares. While Dr. McLauchlan seems to hold up stated importance as a better alternative than regression, I contend the stated approach has several critical shortcomings relative to regression.

For one thing, self-stated importances offer no model of how the overall rating is arrived at by respondents. Secondly, any weighting system based on self-stated importances will provide more error of prediction for the thing we probably care most about influencing, the overall measure. Third, there is absolutely no assurance that increasing scores on attributes with the highest self-stated importances will provide maximized increases in the overall measure. In fact, based on the demonstration of regression's best fit, changes corresponding to stated importance will not maximize increases in the overall measure.

A note on regression and causality

Much of the preceding discussion, and the premise of doing regression with CSM data, implies that attribute perceptions combine to produce or determine overall perceptions. Clearly this involves the notion of causality, something Dr. McLauchlan warns is an "extremely dangerous proposition" (p. 12) for CSM research. However, I argue that multiple regression cannot be discarded on these grounds.

There is far more involved in the process of inferring causality than the choice of statistical technique. Several

requisite conditions must exist. For example, there needs to be a sound conceptual/theoretical foundation in which plausible alternative explanations can be ruled out. Further, if X causes Y, X must occur before Y. Also, there must be an empirical association between X and Y. This last point is particularly important for the current discussion. While Dr. McLauchlan has correctly pointed out that "correlation is not synonymous with causation" (p. 12), causation certainly implies correlation.

Consider the case of cigarette smoking and lung cancer. If smoking really causes lung cancer, then there needs to be some co-occurrence (correlation) of the cancer with smoking. The association needs to be viewed conceptually and theoretically so that we do not misinterpret the correlation by saying that lung cancer causes smoking. But, given the strong case for smoking as a cause of lung cancer, we certainly expect to find correlation. The question then becomes, given proper conditions for inferring causation, could we appropriately use multiple regression to estimate the degree of influence that smoking has in determining something like risk for lung cancer? The answer is yes. Regression can be used in studying causal processes.

Dr. McLauchlan is correct in stating that regression analyses "do not produce causal models" (p. 13), but the issue of causality does not rest in the choice of analysis technique. Simply using regression as a statistical procedure says nothing about causation. However, once one meets conditions for inferring causality, regression analysis most certainly can be used to estimate the magnitude of effects in causal models. In fact, the sociological and psychological techniques referred to as "path analysis" provide a rich and extensive history of using multiple regression to estimate effect sizes in causal models. Further, multiple regression can be used to produce estimates of causal effects from traditional experimental designs. These estimates can be shown to be exactly equivalent to those produced by the more standard analysis of variance (a tool often used in causal research).

So, again, we cannot rule out regression as a poor statistical tool for CSM simply for the fact that it does not inherently allow one to infer causality. Even very sophisticated approaches to causal modeling (e.g., use of LISREL) do not inherently allow causal inference. Statistical techniques cannot asses where the numbers come from. It is the researcher's job, regardless of the choice of statistical technique, to assess the plausibility of causality.

Thus, regression can certainly be used as a tool in CSM research, even to infer causality in those areas where it is justified. After all, if we cannot reasonably argue that

improving the quality of various components and processes of our business will lead to higher ratings of the overall company measures we care about, what is the point of doing the research in the first place?

Good regressions from good design

Dr. McLauchlan points to "numerous other risks associated with regression-based approaches to satisfaction analyses" (p. 13). However, I argue that many of these risks are the result of poor data conditions rather than an issue of any particular statistical technique. Statistical problems more often than not will be ascribable to "messy" data that comes from a researcher's poor design rather than inherent shortcomings of analysis techniques like regression.

Let us consider two of the problems Dr. McLauchlan raises: multicollinearity and low R^2 values. I would tend to question the design quality of a regression model with "20 or more regressor variables" (p. 12) that still had low R^2 values.

A response to Grisaffe

by William McLauchlan

William McLauchlan, Ph.D., is principal, McLauchlan & Associates, Cincinnati.

I would like to express my thanks to *Quirk's* for providing the opportunity to respond to Doug Grisaffe's remarks. His critique of my article needs to be addressed lest the reader be left with several inaccurate and potentially misleading conclusions.

While I will address the specifics of each of his key criticisms below, I would like to begin by stating that I believe Grisaffe has missed a major point in my article. That is, he seems to have read the piece as though I was in some way "blaming" multiple regression for problems associated with messy data sets. In fact, the focus of my article, as reflected by its title ("Regression-based satisfaction analyses: proceed with caution") did not "blame" regression. Instead, it pointed out a number of serious consequences that can occur when using multiple regression analyses with messy data and that caution should be exercised.

Further, I would suggest that messy data exists with much greater frequency than Grisaffe would lead one to believe. If all of Grisaffe's customer satisfaction data sets behave as well as the reader is lead to believe, then I truly believe that Grisaffe and his organization are to be commended. I suspect that such perfectly behaved data is the exception.

Have made this general remark, I would like to speak to each of Grisaffe's key points.

1. Hypothetical data

Of course my data set was contrived. It was chosen precisely for the purpose of illustrating suppressor effects and the inherent dangers of misinterpreting regression coefficients with the wrong sign. I do not suggest for a second that these kinds of outcomes are "problems" with regression. Clearly these are data problems.

While Grisaffe is quick to point out what he calls the "non-typical" conditions associated with my hypothetical data, he has neglected to point out the even more atypical relationships in his own example data (Table 2). Here is the correlation matrix Grisaffe failed to provide:

	Attribute		
	1	2	3
Overall	.53	.30	.71
Att. 1		.00	.00
Att. 2			.00

Are data sets with between attribute correlations of 0.0 more typical than data sets with the potential for suppressor effects? I suspect this is not the case.

2. Nonsignificant attributes with high stated importance

As before, I did not suggest that the situation where an attribute garners a high stated importance rating but is not a determinant attribute in a regression-based analysis was, as Grisaffe has attributed to me, a "problem with multiple regression." Again, it is a data issue.

Of course, my data points were chosen carefully. They were selected to illustrate the danger of using a "model" that is clearly based on a world-as-it-is perspective to make predictions about future overall customer satisfaction.

I certainly agree with Grisaffe when he states that most consumers would give high importance ratings to safety in airline choice. I also concur that, in general, stated importance ratings tend to overweight the importance of low probability events. However, while airline safety may have relatively little to do with why people choose an airline on any given day, I suspect it has a tremendous amount to do with airline choice following a disaster. (I also suspect that airline safety has some non-zero importance weight at all times.)

The larger point here is that regression-based analyses are status quo assessments of the reasons for satisfaction. And, while Grisaffe's airline example is clearly demonstrative of this world-as-it-is perspective, how does he ever know that airline safety would get high stated importance ratings unless he asks?

More fundamentally, how do we know what the "minimum requirements" are in any product category? Grisaffe seems to imply that it may be the attributes that are not significant predictors of overall satisfaction that are the minimum requirements in a product category. I am not comfortable with that assumption.

Finkbeiner (1992) stated that the

Further, with 20 prediction attributes, it would not be surprising to find multicollinearity.

I contend that good regression models come from good designs. Measuring many redundant attributes will of course produce multicollinearity. Even worse would be the use of stepwise regression in such a design to statistically "fish" for the determinants of the overall measure. That approach is notorious for capitalizing on chance.

Proper questionnaire design, based on good qualitative or secondary research and an in-depth understanding of the research context, is the best protection against low R^2 values and multicollinearity. Having done one's design "homework", one can specify the "right" regression items based on sound management reasoning and the voice of the customer, not statistical fishing. Then, all the coefficients for that well-thought-through model can be estimated with standard multiple regression. The coefficients reveal relative impact among the items that are already known to "matter". In this way, one is already dealing with "high importance" items before even getting to the regression work.

Further, if the "right" items are determined a priori, questionnaire design is maximally efficient. To fish for the right variables after the fact implies that unnecessary items were included in the questionnaire, only to be tossed out after statistically discovering that they do not belong. With the right items included by design, R^2 values will be sufficiently high to support the regression models. Finally, there will not be a need to conduct principal components analysis, especially if the attributes have been organized into logical groupings in advance. This will leave attributes at an actionable level so that managers know what to do when CSM analyses point to areas for improvement.

In summary, several of the "risks" Dr. McLauchlan assigns to multiple regression are linked more to issues of good design than the statistical technique itself. Again, there is an appropriate way to validly apply multiple regression to CSM analyses.

Should complexity prevent use?

Dr. McLauchlan presents a number of issues that need to be considered when running regression analyses (e.g., treatment of missing data, choice of modeling approach, etc.). He advises us "to consider the implications of the modeling technique" (p.13) before deciding to use it. I agree with thoughtful implementation practices. However, I do not believe the complexity of regression issues and considerations should necessarily lead us to a simpler approach like self-stated importance. The complexity of the statistical technique should not dictate whether or not it is appropriate. Instead, an analysis technique should be chosen because it is the best-suited tool to answer the research questions of interest.

We should not avoid the use of multiple regression in CSM work just because it requires thoughtful implementation. We would not advocate the use of aspirin to treat cancer simply because other treatments need to be carefully considered to avoid complicated drug interactions and side effects. Rather, we want careful and appropriate implementation of the most effective method for meeting the need. The analogy to use of

regression in CSM is not trivial. As I have argued earlier, regression is ideal considering the theoretical framework underlying CSM research and the goals of management. Yes, there are many options and complex considerations with regression methodologies. But, in the hands of professional analysts, appropriate application of regression to CSM will validly address the key research questions and management objectives.

Concluding remarks

At a minimum, a company concerned about CSM will need to have a scorecard of customer-perceived performance on key business processes and attributes. These feed into more global overall measures that relate to retention of customers, and hence financial outcomes. Such measures of performance on key items can be obtained with sound research design. The measures then can be used to thoughtfully derive meaningful regression-based information, identifying areas that can be improved to obtain maximized effects on the global measures of interest.

Alternatively, there is the self-stated approach. Twice as many questions will need to be asked for each concept being measured: one for performance and one for importance. Given proper up-front design work, there will be little variation on the stated importance measures, thus limiting their usefulness. Further, making improvements on areas with high stated importance will offer no certainty about the impact, if there is any, on the global measures of interest. For these reasons, and all those described previously, this self-stated approach certainly seems less optimal.

While there may be some contexts in which stated importance is suited to the research questions at hand, I believe the research questions and management goals of CSM work make regression and its outputs a smarter and more powerful choice of analysis technique. By tracking performance and regression information across time, and implementing corresponding quality improvement efforts, one can monitor and influence the customer attitudes and intentions of interest. Management decisions based on such information, of which regression analysis is an integral part, can then lead to targeted gains in quality improvement and customer satisfaction, thereby increasing a variety of strategic and competitive business outcomes.

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Thanks to Keith Chrzan and Lee Markowitz of Walker: Research & Analysis for their helpful comments on an earlier draft of this paper.

Data processing made easy

Changes in survey design that will make your data entry and processing go smoothly

by Eric DeRosia

Editor's note: Eric DeRosia is assistant phone center manager with Western Wats Center, Provo, Utah.

With the availability of powerful personal computers and simple to use software, many researchers who used to rely on outside companies for data processing are now considering hiring clerks for data entry and doing the number crunching themselves. If you are thinking about doing your own data processing, or if you simply want to avoid problems when others work on your projects, it may be helpful to listen to the advice of someone who has had years of experience solving marketing research data processing problems. According to Steve Woodall, coordinator of data services for Western Wats Center in Provo, Utah, many common data processing problems that can be avoided by taking a few preventative measures during the survey design process. At first glance these suggestions may seem simplistic, but their implementation will solve many real-life data processing problems. (Note: The following examples represent telephone surveys. However, the same principles apply to surveys conducted in malls, through the mail, or any other data collection technique.)

Use numeric codes to denote options. When writing a questionnaire, many researchers designate respondent options with letters to be circled or empty boxed to be checked. Since almost all forms of statistical analysis require that the data be represented by numbers, this can cause accuracy problems during data entry. The mental gymnastics required for data entry clerks

to convert letters or boxes to numbers can lead to many mistakes. The simplest solution to this problem is to denote each respondent option with a numeric code. (See example 1.)

Use a constant number of digits in codes. Most statistical software identifies data from its column in the matrix

---

Example 1

Do you feel that things in the country are going in the right direction, or have things pretty seriously gotten off on the wrong track?

Right direction	1
Wrong track	2
(DQ NOT READ)	
DK/REF	3

---

of data, that is, its place in that survey's assigned row of data. To avoid data entry mistakes that cause the data to be "misplaced" in its row, leading zeros should be used to make each option code a similar number of digits. (See example 2.)

These extra digits will serve as a reminder to data entry clerks that this question requires the entry of two digits. Without a reminder, clerks may enter only a single digit for options one

through nine, causing subsequent data to be "misplaced" and analyzed in the wrong column as part of the wrong question. Although the clerk may notice the error, there is no reason to take chances. Simply adding leading zeros will prevent such errors before they happen.

At the same time, leading zeros should only be used when necessary. If they are added when there are nine or fewer options, they will create unnecessary work, making the data entry process less efficient.

Example 2

First option	01
Second option	02
. . .	
Ninth option	09
Tenth option	10
Eleventh option	11

Align codes on the right. If clerks must search all over each page for the respondent's answers, the data entry process will be unnecessarily difficult. If the difficulty in finding the data on the

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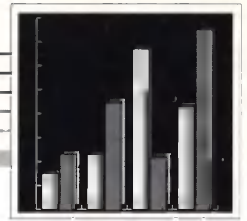# MARKETING RESEARCH
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Supermarket video grew in '92

The new star category in the supermarket industry, the video department, is growing at a rapid clip, according to a study by Food Marketing Institute (FMI). Supermarkets offering videos increased their titles and tapes by 10 percent in 1991, and signs point to continuing the fast growth pace. The report summarizes data from 59 food retailers in the United States with video rentals or sales in one or more of their stores. The respondents operate 1,450 supermarkets across the country.

Supermarket video's strong growth has captured grocery industry and video supplier attention. In 1991, U.S. supermarkets recorded $1.35 billion in video rental and sell-through, and the business could reach $1.5 billion in 1992. More than half of the companies in the FMI survey indicated that by 1993, 100 percent of their stores will offer both video rentals and sell-through videos. Four in 10 say they'll increase the number of sell-through titles, which grew by 27 percent in 1991 alone. Almost three in 10 (28 percent) expect to increase the space for video rentals.

Other findings in FMI's Supermarket Video Operations Survey 1992:

• Supermarket operators carried an average of 1,417 titles and 1,846 tapes per store in 1991 and projected 1,573 titles and 2,088 tapes for 1992.

• Supermarket video departments had substantially more rental transactions (988) than sell-through transactions (70) last year.

• The square footage of selling area for video departments now averages 666 square feet, with larger companies (10 or more stores) averaging about 50 square feet more than the smaller ones. Linear footage averages 207 feet, with a slight difference between large and small firms.

• More than 80 percent of the companies currently merchandise blank videotapes and video games. Less than half carry the remaining video products—hardware rental, software rental, VCR accessories and other items.

• The supermarket video operators' greatest concerns are the cost of purchasing videos and the increased competition from other video outlets. They're also concerned about the growth of other entertainment alternatives, theft/shrink and space constraints.

• The majority of surveyed companies (78 percent) experience seasonality of demand for video. Weather, school and holidays are the primary factors.

• Just over one-third of the titles in supermarket video inventory are "B" titles.

The FMI study also provides information on rental inventory rotation, tape repair, video deletions, and video department security, shrink, staff training, buying decisions, merchandising and future issues. Copies of the study may be purchased from the FMI. Call 202-452-8444.

Study finds public still wary of computers

The Harris-Equifax Consumer Privacy Survey 1992 has found that most Americans acknowledge that computers have brought benefits to society, yet they still consider some uses of computers as threats to personal privacy.

Similarly, the majority of Americans believe it is all right for companies to check public record information on consumers applying for credit, auto insurance or jobs, but believe it is not all right if the consumer has not initiated a transaction.

Other findings include:

• data supporting the practice of stores inquiring into a consumer's check-cash-

Jonathan Kalan has joined *Oral-B Laboratories* in Redwood City, CA, as director, marketing research. He was previously in the marketing research department at The Clorox Company.

Tim Huberty has joined *Clarity Coverdale Rueff Advertising*, Minneapolis, as vice president, director of research and account planning. Previously he was research manager at Fallon McElligott.

New York City-based research firm *Schulman, Ronca & Bucuvalas, Inc.* has announced a number of promotions and staff additions. Promotions: Chintan Turakhia to project director; Scott Brodows to sampling director; Peter Jubber to analyst; Charisse Collier to assistant director of data processing; Leslie Glick to field director. Staff additions: Susanne Tumelty has been appointed director of operations; Maria Lupinacci returns to SRBI as coding director. Gordon Jacobs has been appointed director of the data processing department; David Bulko has been named assistant project director.

Arlington Heights, IL-based *Market Facts, Inc.* has added Susan MacDonald and Arthur Zarin as vice presidents in the company's New York office.

Paul Donato has joined New York City-based *Audits & Surveys* as senior vice president. Previously he was president of the Syndicated Services Division of Simmons MRB.

Kathleen Ritz has been named vice president of telemarketing operations at the *ICT Group*, a Langhorne, PA-based provider of telephone marketing and market research services.

Andrew Giannelli has been named senior account executive, client service, in the Custom Services Division of *The NPD Group*, Port Washington, NY.
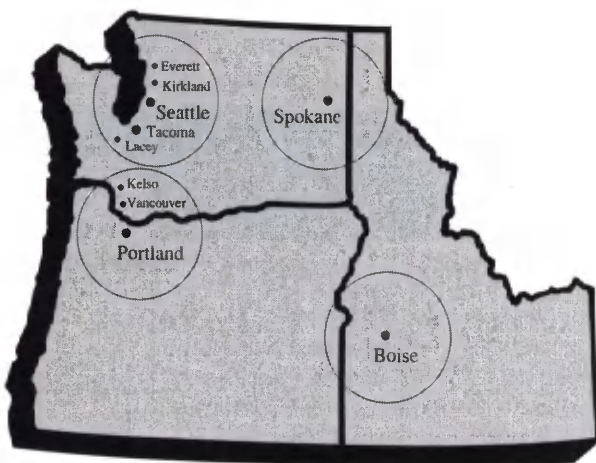
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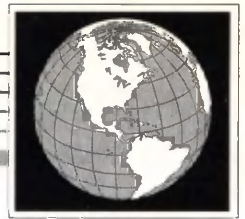
Kennedy Research, Inc. has moved to new offices at 2401 Camelot Court SE, Grand Rapids, MI 49546. Telephone 616-954-0200. Fax 616-954-0001.

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Dale Longfellow has formed **Cambridge Research, Inc.** The firm will specialize in depth and qualitative research and consulting. The company is headquartered at 5831 Cedar Lake Rd., Minneapolis, MN 55416. Phone 612-525-2011. Fax 612-525-2016.

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The youth marketing and consulting firm **Xtreme, Inc.** has changed its name to **The Zandl Group**. In addition, the firm has added an anthropologist and a psychologist to its team. For more information, contact Irma Zandl at 212-274-1222.

◆

Valhalla, NY-based **Moskowitz Jacobs, Inc.**, a scientific market research firm, has completed licensing agreements with several countries for its IdeaMap technology, a system used to develop product and advertising concepts. The new licensees include: Canada Market Research, Toronto; Martin Hamblin Research, London; Treiber & Partner, Dusseldorf, Germany

and Niklausen, Switzerland; and IFOP, Paris.

◆

The Richmark Group, Inc. has moved to new offices at 39 South LaSalle, 5th Floor, Chicago, IL 60603.

◆

Horizon Field Service has moved to new offices at 609 W. Barry Ave., Chicago, IL 60657-4504.

◆

The focus group facilities at **Fieldwork Chicago** have been remodeled and redecorated. In addition, viewing rooms have been added to **Fieldwork East** in Fort Lee, NJ. For more information on Fieldwork Chicago call 312-282-2911; for Fieldwork East call 201-585-8200.

Two new devices for ou-site data collection

Feedback Marketing Services Corp., Wellesley, MA, has introduced Feedback Clipboard, a computerized data collecting device which can be used, unattended, to assist in conducting on-site market surveys. The new unit can be programmed to display a range of questions customized to meet individual requirements and eliminates the need for personal interviewers. It requires no set-up or servicing time, and operates for more than 100 hours on battery power. It can be used hand-held or as a stationary table-top unit. For more information call Robert Eng at 800-826-7418.

Harmon Associates' Point of View Survey System is a portable, computerized opinion-collection device for use anywhere in gathering feedback from respondents. The 3 lb., battery-powered console displays user-defined questions and response choices on an LCD panel. The user-friendly nine-button keypad records answers privately. Branching capability adapts each survey by the responses given. The system's

PC-based software (for any IBM PC or clone) links via the console's serial port for easy design and loading of surveys and uploading and tabulation of responses. For more information contact Robert Harmon at 201-794-8697.

Cahners hiotech list availahle

Cahners Direct Mail Services now offers a mailing list which gives marketers access to over 25,000 decision makers in the biotechnology industry. The new Biotechnology list contains qualified subscriber names from Cahners Publishing's subscription files. It targets decision makers in major corporations, academic institutions and government who provide biotechnology services such as therapeutics, diagnostics, pharmaceutical, and food/agriculture research. These individuals include bench researchers, scientists, managers, and academic professionals who recommend, specify or approve supplies, lab equipment, and related products and services. For more information call 800-323-4958.

Book compiles hundreds of rating scales

A new book, "Marketing Scales: A Compilation of Multi-Item Measures," provides detailed descriptions of nearly 600 multi-item rating scales used in marketing surveys over the last decade. Most of them explore consumer attitudes toward a company, product brand or advertising campaign. Authors Gordon C. Bruner II, an associate professor of marketing at Southern Illinois University at Carbondale, and Paul J. Hensel, an associate professor at the University of New Orleans, spent five years surveying measures published in six marketing journals from 1980 to

1989. They hope it will make questionnaire development easier for industry and academic researchers. "Marketing Scales" is available through the American Marketing Association by calling 312-831-2795.

Sessions aim to stimulate innovation

SpringBoard Innovation now offers WorkSessions, a new service to help users of market research transform data into innovation and action. WorkSessions are half-day focus groups that create a temporary environment to enhance an end-user client's innovative capabilities. A trained moderator leads a group of key decision-makers through a brainstorming process. She injects the relevant market data into the creative process, stimulates innovation, and ensures that the group dynamics enhance the creative process. SpringBoard Innovation works directly with end-user clients or in partnership with research companies. For more information contact Ted Kendall at 713-251-7867.

New pnblication profiles Latin Ameriea

Mexico is the focus of the premiere issue of Market:Latin America, the latest newsletter from W-Two Publications. W-Two also publishes Market:Europe and Market:Asia Pacific. The newsletters are designed to help executives keep abreast of the latest demographic and lifestyle trends and identify business opportunities in each region.

The first issue of Market:Latin America includes the latest census data from Mexico, including projections for labor force and consumer market growth through the year 2000. The issue was prepared with the help of TGE Demographics Inc., a firm specializing in analyzing Mexican demographic trends.

The first year's issues will cover the latest demographic information in eight countries as well as trend nd insight information for the whole region. Upcoming issues will feature articles on the emerging middle class in the region, new opportunities created by consumer demand on Central America, and mar-

ket research reports being conducted in the region. For more information call 607-277-0934.

Data Desk 4.0

Data Description, a provider of exploratory data analysis software for the Macintosh, is now shipping version 4.0 of its Data Desk software. Major enhancements to the statistics application include a multivariate general linear model with a new interface that simplifies use and provides interactive ways to explore data from experiments, no limit on the number of cases, non-linear smoothers, automated sliders, summaries by groups, random subset sampling, and many more.

Despite the addition of the new capabilities, Data Desk 4 occupies about 800K of disk space, runs in as little as 1MB of memory, and adapts automatically to take advantage of available color, floating point processor, or additional memory. For more information call 607-257-1000.

A new approach for analyzing customer satisfaction studies

Understanding vulnerability analysis

by Randy Hanson

Editor's note: Randy Hanson is director, analytical services, for Maritz Marketing Research, St. Louis.

Often when conducting a customer satisfaction study, the vital questions are, "Where should I allocate scarce resources to best satisfy and retain my customers?" and, "Should my focus be sales training, customer service, or billing procedures?" A compelling tool frequently used to help answer these questions is a graph showing each attribute's importance and satisfaction levels in a simple two-dimensional scatterplot. These graphics are known by many names such as importance/performance analysis, quadrant analysis, and performance improvement planner.

Vulnerability analysis is also useful in prioritizing customer satisfaction attributes for action or consideration. This technique goes beyond the sometimes ambiguous plots of each attribute's importance and performance to give the marketer something truly valuable: an attribute list ordered from highest to lowest priority. In a world of black boxes, vulnerability analysis is almost elegant in its simplicity. Though this discussion focuses on customer satisfaction studies, the approach is useful in many marketing research applications. The more you use vulnerability analysis the more you will like it!

Wbat is vulnerability analysis?

Vulnerability analysis begins with a crosstabulation. This familiar, simple method of multivariate analysis does not carry the baggage of assumptions needed for other methods; missing data problems, departures from normality and linearity, etc. are of little or no concern.

Vulnerability analysis simply shows the relationship between an individual attribute and a dependent measure (e.g., overall satisfaction, repurchase intention, likelihood to recommend to a friend).

The crosstabulations involve each attribute in turn as a "stub" or row variable, and the dependent measure as the "banner" or column variable (see table below for an example). The scales used for the dependent measure and the attributes are collapsed into two categories. This categorizing can be achieved in several ways. If your company will accept no less than a perfect "10," the categories will be 1-9 versus 10. If you decide an "8" is acceptable, the breaks will be 1-7 versus 8-10. In a tracking study, where satisfaction levels hopefully increase over time, the categories can be altered to reflect the new higher target, such as switching from breaks of 1-8 versus 9-10 to 1-9 versus 10.

It is probably better to be less subjective and categorize the data based on current satisfaction levels and breaks which are evident in each variable's frequency distribution. Perhaps the best method is to categorize each attribute using a CHAID or CART search proce-dure. Basically, if respondents who rate an attribute "10" give significantly higher overall ratings, then breaks of 1-9 versus 10 are appropriate. On the other hand, if respondents who rate an attribute "8," "9," or "10" all give similar overall ratings, these scale points should be grouped together, so reasonable breaks are 1-7 versus 8-10. Since there is no benefit in terms of higher overall satisfaction, a target rating of "8" is all that is needed. Each attribute, then, potentially has its own unique target.

Let's consider each crosstabulated frequency from our example in more detail. Beginning in Cell D, we find that 151 customers are satisfied overall as well as satisfied with the customer service department (high ratings for both). At least for this attribute, these respondents do not seem particularly vulnerable to competition.

Moving to Cell B, we find 40 customers are satisfied overall (9 or 10) but less satisfied with the customer service department (1-7 ratings). The lower marks for customer service have no adverse effect on the overall rating for these people. Even though there is room for improvement, greater focus on the cus-

	Table 1			
	Vulnerability Analysis			
	Number of Customers Who Rated Their Satisfaction Overall . . .			
		1-8	9-10	
Number of Customers Who Rated Satisfaction With Customer Service Dept.	1-7	A 80	B 40	120
	8-10	C 29	D 151	180
		109	191	300

Note: Number of customers in the entire study providing a valid rating (1-10) for overall satisfaction equals 400.

tomer service department is wasteful for this group.

Continuing to Cell C, we see that 29 customers rated the customer service department high, but overall satisfaction low. Something is having a negative impact on the overall rating , but it is not likely to be the customer service department. Since this group is already highly satisfied with this attribute, it would again be a waste to invest more resources here.

For varying reasons, increased focus on and investment in, the customer service department may be inefficient for these first three groups. What about the customers in Cell A of the crosstabulation? Here we find 80 people who are relatively less satisfied both overall and with the customer service department. Dissatisfaction overall may be related to dissatisfaction with this attribute for this customer group. Without an improvement in the customer service department, these 80 customers are vulnerable to a competitor (hence the name vulnerability analysis). Vulnerability is simply the number of customers who are simultaneously less satisfied with an attribute and less satisfied overall. They are therefore vulnerable to a competitor who can outperform you on that attribute.

In a strict sense, vulnerability as defined above should be called relative vulnerability. You can argue that all customers are vulnerable to a competitor who, for example, offers a superior product or service at a lower price. This analysis focuses on the core group of customers who are most vulnerable to competition on this specific attribute given the existing situation in the marketplace.

Similar analyses are conducted for each attribute in the study. The output for vulnerability analysis is a table of all attributes ranked by their corresponding vulnerability. The attribute at the top of this list answers the question, "If satisfaction remains at current levels, on which attribute am I most vulnerable to competition?"

Vulnerability can also be expressed as a percentage, but the correct base in most cases is the number providing a valid overall rating in the study as a whole, not the crosstabulation total. In this way, the percentage reflects the degree to which a problem exists in the total market: other things equal, an attribute that affects 100% of customers is of greater concern than an attribute that affects only 10% of customers. For our example, the note states that 400 customers provided valid overall ratings. Only 300 were able to rate both the

customer service department and overall satisfaction (some respondents were not able to rate the customer service department, probably because they had no experience with it). The customer service department is a factor, then, for three-fourths of your customers. To include this effect, our vulnerability percentage should be calculated as $80/400 = 20\%$. If for some reason you would like to factor out this effect (e.g., assuming that all customers will eventually be affected) the calculation is $80/300 = 27\%$.

The components of vulnerability

Vulnerability analysis is a deceptively simple concept. On its face, it is the result of an artless crosstabulation. On closer inspection, vulnerability accounts for three separable and quantifiable components:

1. Extent or proportion affected. This component is the percentage of customers able to rate (i.e., have experience with or interest in) an attribute. It represents the pervasiveness of this attribute among customers. The grand total for each attribute's
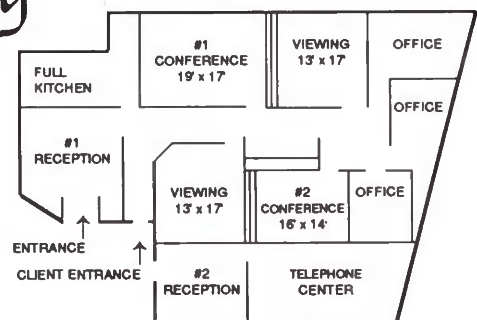
Response

"use of the (regression) model for predictive purposes must be kept in proper perspective...Limitation of the data to the world-as-it-is creates just as much restriction (if not more) for preference regression as it does for benefit/loss charts. Because of this limitation to the world-as-it-is, extrapolation of attribute performance beyond whatever is represented in the marketed products is not safe. For example, if no differences exist between companies on price, then price cannot account for any variance in overall satisfaction. If however, one company changes its price significantly from all the others, then price will certainly become an important variable...As a consequence of this dependence on the world-as-it-is, preference regression has a tendency to rediscover sameness in company performance and to recommend the known, safe solutions to performance improvement (p. 143)."

3. Stated importance versus derived importance

Grisaffe refers to my Sawtooth Soft-

ware Users Conference paper (McLauchlan, 1992b). In this paper, I hypothesized that stated importance ratings might do a better job with feature-based categories and that derived analyses might do better with image driven categories. What I found empirically were stated and derived measures that, in fact, correlated quite well with each other in three product categories that span the gamut from predominately feature advertised (commodity chemical) to largely image advertised (beer).

4. Regression fits CSM theories and management goals

Grisaffe states, "CSM researchers are interested in finding ways to increase scores on the overall measures (p. 13, Feb. '93, QMRR)." In Joel Huber's discussion of my Sawtooth paper (Huber, 1992), he made the point that "correlational measures can be quite misleading in that they assume that the range of attributes will remain constant. Stated importance measures, by contrast, implicitly ask respondents to indicate how important an attribute would be if it does change. This line of reasoning suggests that correlational measures are appropriate when managerial action will preserve attribute expectations in the market, while stated importance ratings are more appropriate when they will alter them...Correlational measures may be good for generating ideas, but can produce very misleading managerial recommendations (p. 314)."

Huber goes on to recommend conjoint tasks as a way of dealing with the shortcomings of both stated importance and regression-based satisfaction analyses. I heartily concur.

Of course it is not surprising that no other linear model than multiple regression will best-fit Grisaffe's (or anyone else's) customer satisfaction data set. Regression, as applied here, is a least squares procedure in which the objective in deriving the coefficients is to minimize the residual sums of the squares. Having said this, the fact that no other linear "model" will better fit the data is not, in itself, grounds for applying the model. (The whole issue of linear versus non-linear relationships in customer satisfaction data will not be discussed here. I would, however, suggest that the reader not make the presumption of linearity lightly.)

Consider again Grisaffe's own hypothetical data set. Huber, like Finkbeiner,

cautions that "derived importances, reflecting the correlation between preference and the attribute ratings, depend critically on the variability of the attribute in the market (p. 314)." Certainly derived importances also depend critically on the variability in overall satisfaction. If respondent 2 in Grisaffe's data phoned in sick during data collection, we would have no variability in the criterion and a model which cannot be specified at all. Demonstrating a best-fit relationship in a data set is not a sound basis for presuming a meaningful model. Recall my own hypothetical data set which, in spite of the suppressor effects, and in spite of Grisaffe's discounting of these effects, still yields a "best-fit" equation.

5. A note on regression and causality

Grisaffe speaks extensively about plausibility as an important basis for inferring causality in regression-based satisfaction analyses. I happily acknowledge that the implication of causation can be reasonable given an empirically demonstrated basis for that plausibility. And while his smoking example fits the category of having a plausible basis for inferring causation, customer satisfaction is not cigarette smoking and lung cancer.

If it is plausible to assume that a high correlation between overall satisfaction and satisfaction on an attribute such as "on-time delivery" resulted because a high degree of satisfaction with delivery performance "caused" a high level of overall satisfaction, is it not just as plausible that a high level of overall satisfaction "caused" "halo" effects in some attribute ratings, such as "on-time delivery"? I think it is.

As Kerlinger and Pedhazur (1973) stated, any student of elementary statistics knows that there can be a high correlation between two variables when in fact there is no direct or causal relationship between the variables. Further, a high correlation in one sample may be zero in another.

Huber states that "causality is equivocal in derived importances" and that "the point is not to resolve these two interpretations but to understand the problem with trying to tease them apart. Many hours have been spent with path models and causal modeling to try to parse causal paths, but the most common outcome from such careful analy-

sis is an acknowledgment of how difficult it is to derive causal relationships from cross-sectional data (p. 314)."

Similarly, Kerlinger and Pedhazur write that "the reality is that... independent variables are usually correlated. Consequently, interpretation of regression analysis data is often complex, difficult, even misleading (p. 77)." Darlington (1968) indicated "it would be better to simply concede that the notion of 'independent contribution to variance' has no meaning when predictor variables are intercorrelated (p. 169)."

Grisaffe gets no disagreement from me when he advances the premise that improving the quality of "various components and processes of our business" should lead to higher overall satisfaction measures. However, this is not the point. The issue is the identification of those components likely to impact overall satisfaction to the greatest extent. Grisaffe argues for multiple regression as a tool for identifying those components. Based on the reasons advanced in my original article and supported by the arguments made here, I must continue to disagree.

6. Good regressions from good designs/should complexity prevent use?

I do not "assign risks" to regression as a statistical technique. I do not expect regression to compensate for anything including "messy" data. Neither do I advocate "statistical fishing" using stepwise models. Nor does the complexity of regression lead me to recommend a simpler approach. My article simply points out several important and real-world issues that can impact a regression-based analysis and its interpretation.

Of course, sound designs are critical in any research effort. Grisaffe's expectation of sound research design in customer satisfaction appears to be synonymous with regression models which use the "right" items that are "already known to matter," that exhibit no multicollinearity and that result in models with high R-squared values. I am not convinced that we always know enough about the issues and variables to assure these kinds of outcomes.

I maintain that regression-based satisfaction analyses are not as straightforward as might appear at first glance. It is my hope that the issues raised in my original article and the points made by Grisaffe in his rejoinder will continue to foster meaningful debate. All of our customers will benefit.

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Data Processing Made Easy

page causes a clerk to accidentally skip a response during data entry, all the subsequent questions will be entered in to the wrong columns as explained above. By aligning the codes on one side of the page, this problem will be solved.

Because surveys are usually stapled in the upper-left corner, aligning the answer codes on the right side of the page, rather than on the left, will make

viewers will record the answer in a myriad of ways, making data entry difficult. Unless these two answers must be analyzed separately, a single code can be simply added, as in example 1. By adding this code to each question, don't know/refused responses can be handled with consistency.

Define skip pattern logic clearly. Confusion over skip pattern instructions during data collection will cause problems during data processing. Consider example 3.

Since there is no skip instruction for

confusion during data processing. By simply adding an instruction to the DK/ REF option, interviewing and data processing confusion will be avoided in situations such as this.

Provide generous room for open-ended answers. When detailed open-ended answers are desired but not enough page-space has been allotted, interviewers will often "cram" the answer onto the space given, making the answers difficult to read. By simply expanding the allotted space, answers will be easier to read and therefore the open-end processing will be more accurate.

These few steps, if taken during the survey design process, will make your data processing easier. Numeric codes should be used to identify respondent options. The number of digits in the codes should be minimized and kept constant. The codes should be aligned on the right side of the page. In addition, skip pattern instructions should be clearly explained. Lastly, generous page space should be provided to interviewers to write open-ended responses. Applying these simple suggestions will increase data processing accuracy, improve efficiency, and prevent headaches. ❏

Example 3
Do you feel Blake Ream has done his job as congressman well enough to deserve re-election, or do you feel it is time to give someone else the chance to do a better job?

Re-elect	1(Skip to Q.11)
New person	2(Skip to Q.12)
(DO NOT READ)	
DK/REF	3

---

both interviewing and data entry faster and more convenient.

Options for don't know/refused. Almost all questions will have at least one respondent who says " I don't know" or refuses to answer. Without a consistent way of handling these responses, inter-

the third option, the interviewers will be unsure of what to do when a respondent answers "I don't know." Some interviewers will respond by asking question 11, some will ask question 12, some will ask neither, and a few will ask both. Such inconsistencies will cause

Classification Trees

in developing their market plans.

The chart displayed in Figure 2 shows that while nine key segments have been identified as nodes on the classification tree, three segments (shown at the bottom of the chart) account for almost half of the CSB owners. By identifying segments in this fashion Market Facts is in a position to advise its clients where they can best invest their marketing dollars. In Figure 2 the best segments are those with the highest gains ratios; for example, the segment at the bottom

Benefits of classification trees

The primary benefits of classification trees are the thorough, automated analysis and time savings they offer. As shown above, crosstabulation approaches do not readily summarize data relationships—certainly not when it comes to producing three-way and higher dimensional tables. There are just too many operations to perform and tables to look at. In the case of CSB ownership, presented in Figure 1, there are approximately 2^{25} different ways (over 25 million) that the predictor codes could be clustered with respect to their inter- and intra-group values on the Canada Bond Ownership variable—a daunting search task if done using traditional statistical methods. Classification trees do this job automatically—usually in a matter of minutes.

Another benefit of classification trees is the ability to calculate all possible segmenting variables at any level of the tree. This provides the user with the ability to preview all possible classifier variables at any stage in the growth of the tree in order to pick the "best" classifier (from the point of view of explanatory power, theoretical market model, or both). Once a branch is grown and descendent nodes (or leaves) of the classification tree are displayed the process of segmenting lower nodes can begin anew. Thus, in descending to lower and lower nodes the full tree is grown. This produces a refined market segmentation model where the bottom nodes, or branches, are pre-

sented as unique market segments. By tracing the branches that define these terminal nodes the multi-dimensional attributes that define the market segment may be identified. This simplicity of presentation is a major benefit in its own right: each market segment is clearly identified as a separate node of the classification tree. Since groups of codes are clustered together the information is presented in summary form. So the information is highly summarized and rapidly digested. And unlike most multi-dimensional techniques, the information is displayed graphically. So the results can be immediately duplicated and distributed to non-statistical audiences.

The kinds of classification tree software illustrated in the Market Facts case study have a long history in social research[4]. But it is only recently with the advent of personal computer software packages that the benefits that these packages offer have become widely available. Classification trees will play an increasingly important role in the marketing activities of companies now and in the years to come because they enable suppliers of data and research products to quickly identify niche markets for products where the demand is strong and where the purchasing power is greatest. ❑

Footnotes

1. Classification trees are PC-based implementations of mainframe AID, CHAID and CART packages.

See Steven Struhl's article "Classification tree methods: AID, CHAID and CART" in the February 1992 issue of Quirk's Marketing Research Review *for a comparative analysis.*

2. There are two PC products that are widely available in the market now—one is developed by SPSS Inc. of Chicago, Illinois (PC+/CHAID); the other by FirstMark Technologies Ltd. of Ottawa, Canada (KnowledgeSEEKER).

3. The type of dependent variable normally determines whether the analysis is considered CHAID or CART. CHAID refers to CHI-squared AID, so works with a categorical dependent variable, CART refers to Classification and Regression Trees, so works with a continuous dependent variable. KnowledgeSEEKER, refered to above, perform both kinds of analysis.

4. For a description of the early AID package see Morgan, Baker and Sonquist "Searching for Structure," Institute for Social Research, University of Michigan, Ann Arbor, Michigan, 1973.

Figure 2: Market Gains Chart for Canada Savings Bond Ownership

	% of Total Population	% Owning CSBs	% Total CSB Owners	Gains ratio
Under $15,000 Income	15%	18%		(0.46)
				(0.66)
$15-24,000 Income	15%	26%		(0.6)
		26%		
$25-49,000/French Speaking	8%		14%	1.07
		43%		
$50,000+ income/ Quebec & Prairies	13%			1.07
		43%		
$25-49,000 income/ English speaking/ Rural and large cities	13%			1.25
		53%		
$25-49,000 income/ English speaking/Small towns & mega cities*	12%			1.25
		50%		
$50,000 + income/Ontario & B.C./1-2 household size	8%			1.5
$50,000+ income/ Ontario & B.C./ 3+ household size	13%	64%		1.5
$50,000 + Income/Atlantic	3%	69%	5%	1.6
	100%	40%	100%	

* Mega cities = 1 MM. +; Large cities = 100M - 1MM; Small towns = under 100M

of the chart—people who earn at least $50,000 per year and who live in Ontario and British Columbia in households of three or more persons—represent 13% of the total population but account for 20% or one-fifth of the total CSB buyers. This gives them a gains ratio of 1.5 —a leverage of 50%!

Survey Monitor

ing history

• some negative response about the degree of protection of personal information to be expected from business in the future.

Conducted in June 1992 by Louis Harris and Associates for Equifax, the latest survey is the second annual update to the 1990 study The Equifax Report on Consumers in the Information Age. It reveals that consumers see benefits and dangers surrounding uses of computers and in the availability and use of public record information by businesses and individuals.

• Most Americans acknowledge the benefits that computers have brought to society. Almost four in five (79%) agree that "computers have improved the quality of life in our society." Eighty-nine percent agree that "computers give people more convenient access to useful information and services."

• At the same time, most Americans also acknowledge that present computer uses pose dangers to personal privacy. Almost seven in ten (68%) Americans agree that "the present uses of computers represent a threat to personal privacy."

• Regarding public records, the majority of Americans believe it is all right for companies to check public record information of consumers applying for credit (71%), auto insurance (72%), or a job (75%).

• On the other hand, the public is much less likely to say it is all right to have individual public record information available to private investigators (34%), companies who mail people information about products and services (34%), and the media to publish information about public figures (28%).

Vuluerability Analysis

crosstabulation is limited by the proportion of customers affected. If other things are equal, the higher the percentage of customers affected, the higher the vulnerability. For our example, this component equals 300/400, or 75%.

2. Severity of the problem, or attribute satisfaction level. This percentage determines how many customers make up the total for each row. For example, the crosstabulation total times the less satisfied percentage determines the first row total. If other things are equal, an attribute with lower satisfaction levels produces a larger vulnerability. For our example, this component is 120/300, or 40%.

3. Impact, or strength of association with dependent measure. The stronger the link with the dependent measure, the more likely customers who are less satisfied with an attribute will also be less satisfied overall. This component can be represented by the chi-square statistic or the correlation coefficient. It can also be calculated as the percentage less satisfied overall among customers less satisfied with an attribute. If other things are equal, the stronger the association with the dependent measure, the larger the vulnerability. For our example, $80/120 = 67\%$. Note: If the overall rating and this attribute were not related—i.e., statistically independent—we would expect a Cell A frequency of only about 44, not 80.

All three of these components combine to determine vulnerability. Breaking vulnerability into its components leads to two common-sense recommendations:

•Focus on aspects that represent severe problems, have an impact on the dependent measure, and affect a large part of your customer base.

•Pay less attention to those aspects where you are doing well, the link with the dependent measure is weak, and only a small percentage of customers are affected.

The output from vulnerability analysis, in addition to a ranking of the attributes, can also show how vulnerability separates into its three components — extent, severity, and impact. We can determine the major contributor toward a large vulnerability by comparing the relative magnitudes of the components with those for other attributes. Assume we have two attributes that affect all customers (extent = 100%). An attribute with mediocre satisfaction ratings but high impact may have the same vulnerability as an attribute with feeble satisfaction ratings and low impact. Although the vulnerability to competitors is comparable, the prescription for action may be quite different.

Critics at this point may say this approach is fine as far as it goes. But since each attribute is considered individually, we have not revealed any of the interplay or relationships that are sure to exist among the attributes. These important associations can be discovered using other multivariate techniques such as variable clustering, or factor analysis followed by a multiple regression on the derived factors. An interesting and often fruitful approach is to conduct a TURF analysis on vulnerability data. This analysis shows the groups of two, three, or more attributes that most efficiently and parsimoniously minimize your vulnerability to competition.

Summary

Vulnerability analysis gives the marketer one number or percentage for each attribute to determine where to invest or cut back. The same analysis can be conducted on your competitors to discover their weaknesses. Vulnerability analysis goes beyond standard Importance/Performance plots by, 1) making attributes with widely differing impact (importance) and severity (performance) directly comparable, 2) explicitly accounting for varying base sizes across attributes, 3) eliminating the restrictive assumptions required by other multivariate methods (e.g., regression/correlation, partial least squares, LISREL), and most importantly, 4) yielding more intuitively appealing results.

As stated earlier, vulnerability analysis seems deceptively simple — which may be enough reason for some practitioners to reject it. This simplicity also represents its greatest strength — it is easy to communicate the results to non-researchers. Like any other technique, it may have shortcomings. Still, vulnerability analysis can be an important piece when you are trying to solve the customer satisfaction puzzle. ❏

Levi's

ing, obviously, but it takes the computerese out and lays things out for them in simple language."

Overall, the computer-assisted interviewing greatly simplifies the process, Burch says. "We developed special scales for the kids to use and it's very helpful to be able to do it using the computer. In the past we relied on physical objects and that required taking time out to explain the scale and how to use it.

"You're dealing with complex situations and the computer can handle these things and present brand lists on a randomized basis. It handles the skips and instructions and eliminates errors. It pulls up screens that would not otherwise appear based on responses. You don't have to ask kids about things that aren't relevant."

Reduces tasks

The software further simplifies the interview process by reducing the number of tasks the interviewer has to handle and by offering clear instructions. For example it cues the interviewer on when to initiate the VCR section and when to pass the screen to the child. "In a mall setting when you're trying to do multiple things interviewers tend to get overwhelmed by all the pieces of paper they have to handle. This way there wasn't much of that. Instead of juggling the questionnaire and figuring out when to play the video it was all explained to them in a step by step way," ACS's Amy Yoffie says.

Burch: "The system enables us to obtain much more information than you would otherwise be able to with kids. An interview length of 30-45 minutes is pushing it, even with older kids, and with this type of approach, using the videotape presentation and the entertainment breaks, we were able to maintain their active involvement and get information that I don't feel we would have been otherwise able to do in the traditional paper and pencil interview."

Quick turnaround

The data is sent to ACS for tabbing, either on disk or via modem. The modem option means that turnaround can be quite short, though not every mall

facility is equipped to handle data transmission that way.

"Everyone is taking baby steps," Yoffie says of the mall facilities, "but we have three or four groups of mall facilities that we work with who can transmit by phone. That's been a real boon. We did a study for another client involving a name test and we started Thursday and we had data to them on Monday morning because they were deciding that afternoon what to go with. It doesn't get much better than that."

New technology

Though it can be difficult to convince clients to make the leap into new technology, Burch says Levi's was comfortable with the new system. "Levi's is really a very forward looking client. Not every situation is going to be appropriate for a computerized interview with children but many are. It can be particularly advantageous with tracking situations. They were oriented toward this system, recognizing that what they wanted to do was pushing the outer limits in terms of the interview length and the attention and interest of the children. They knew there was the chance that the data toward the end of the interview would be jeopardized. So they saw the need to come up with something innovative and unique that would allow them to get as much information as they wanted to from the kids but in a way that was not onerous for the children.

"The experience has been a real positive one and shown me that computer interviews are not simply ones where the interviewers administer the questionnaire. A system where the child actually interacts with the computers themselves is suitable and appropriate for children's research and has significant advantages in certain situations. Not every project requires computerized interviews and we still do a number of traditional types of interviews. But in tracking situations, concept testing and other situations where the measurements are essentially going to be repeated, and where there's complex information to present to the respondent and tasks that challenge the interviewer in terms of their administration of the interview, this is the way to go. It can really pay some dividends." ❑

1993

DATA PROCESSING / SOFTWARE /

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The Accutab Company
125 Marsellus
Garfield, NJ 07026
Ph. 201-546-7100
Fax 201/546-9687
Contact: Jon Brunetti
Section I, II

Acquadata Entry Services Inc.
3040 E. Tremont Avenue
Bronx, NY 10461
Ph. 718/824-8887
Fax 718/824-8856
Contact: Susan Acquafredda
Section I

Adapt, Inc.
6133 Blue Circle Dr., Ste. 100
Minnetonka, MN 55343
Ph. 612/939-0538
Fax 612/939-0539
Contact: Karen Koch
Section I,II

Advanced Concepts
4129 No. Port Washington Ave.
Milwaukee WI 53212
Ph. 414/963-0999
Contact: Jeff Wohlfahrt
Section III

Advanced Data Research
470 Enterprise Court
Bloomfield Hills, MI 483029
Ph. 313/332-1217
Fax 313/332-4168
Contact: Kevin Cook
Section III

Alphastat Research Corporation
89 Bay State Rd.
Belmont, MA 02178
Ph. 617/484-2659
Fax 617/484-1430
Contact: Minna Levine
Section I,II

American Demographics
P.Q. Box 68
Ithaca, NY 14851
Ph. 800/828-1133
 Fax 607/273-3196
Contact: James Madden
Section III

Analytical Computer Service, Inc.
640 No. LaSalle Dr.
Chicago, IL 60610
Ph. 312/751-2915
Fax: 312/337-2551
Contact: Jerome Madansky

Branch:
    8687 E. Via de Ventura
    Scottsdale, AZ 85258
    Ph. 602/483-2700
    Contact: Jack Pollack

    2001 S. Barrington Ave.
    Los Angeles, CA 90025
    Ph. 310/479-3777
    Contact: Gary Zemtseff

    85 River Street
    Waltham, MA 02154
    Ph. 617/899-1120
    Contact: Carmen Montes

    414 Central Ave.
    Westfield, NJ 07090
    Ph. 908/232-2723
    Contact: Amy J. Yoffie
Section I, II, III, IV

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18 Brattle Street
Cambridge, MA 02138
Ph. 617/491-8171
Contact: John Pitkin
Section II

Analytic Consultants Inc.
4 West Trail
Stamford, CT 06903
Ph. 203/329-1355
Contact: Eric Friedman
Section II, IV

Apian Software
P.O. Box 1224
Menlo Park, CA 94026
Ph. 800/237-4565 Ext. 297
Fax 415/694-2904
Contact: Bill Ray
Section III
(See advertisement on page 21)

Ardisson & Associates, Inc.
2399 Hwy. 29 South, #4
Lawrenceville, GA 30244
Ph. 404/339-1091
Fax 404/339-1092
Contact: Tom Ardisson
Section I

Atlantic Marketing Research Co., Inc.
109 State St.
Boston, MA 02109
Ph. 617/720-0174
Fax 617/589-3731
Contact: Peter F. Hooper
Section I,II

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7009D Taylorsville Road
Dayton, OH 45424
Ph. 513/235-2962
Fax 513/235-2743
Contact: Linda Seitz
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P.O. Box 400
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Ph. 800/359-7738
Fax 719/275-1664
Contact: Michael Fry
Section III

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230 Western Ave., Ste. 201
Boston, MA 02134
Ph. 617/254-1314
Fax 617/254-1857
Contact: Matthew Hayes
Section I,II

Lisette Berry Associates
100 Bank St., #3H
New York, NY 10014
Ph. 212/691-7592
Fax 212/691-7543
Contact: Lisette Berry
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Los Angeles, CA 90025
Ph. 310/473-6759
Fax 310/473-6012
Contact: Dave Wood
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1440 Sepulveda Blvd., #316
Los Angeles, CA 90025
Ph. 213-479-7799
Section II, III, IV

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22 Sachem Street
Norwalk, CT 06850
Ph. 203/847-1108
Fax 203/849-9300
Contact: Lee Bolding
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Bradenton Data
1303 10th St. E.
Palmetto, FL 34221
Ph. 813/729-5694
Fax 813/729-2739
Contact: Scott Stewart
Section I

Bretton-Clark
89 Headquarters Plz., 14th Fl.
Morristown, NJ 07960
Ph. 201/993-3135
Fax 201/993-1757
Contact: Steve Herman
Section III
(See advertisement on page 12)

Brunetti & Associates
448 Palisade Ave.
Cliffside Park, NJ 07010
Ph. 201/945-4607
Fax 201/945-9266
Contact: Wally Brunetti
Section I,III

Business Forecast Systems, Inc.
68 Leonard Street, 2nd Flr.
Belmont, MA 02178
Ph. 617/484-5050
Fax 617/484-9219
Contact: Kathleen Hemming
Section III

CACI Marketing Systems
1100 No. Glebe Rd.
Arlington, VA 22201
Ph. 800/292-2224
Fax 703/243-6272
Contact: Michael Johnson

Branch:
    3333 N. Torrey Pines Ct.
    La Jolla, CA 92037
    Ph. 800/394-3690
    Fax 619/450-0463
    Contact: Paula Ciminelli
Section I,II,III

Caliper Corporation
1172 Beacon Street
Newton, MA 02161
Ph. 617/527-4700
Contact: Howard Slavin
Section III, IV

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32-34 Main Street
Norwalk, CT 06851
Ph. 203/854-6587
Contact: John Cascio
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8101 Agnew Road
Ceresco, NE 68017
Ph. 800/642-4638
Fax 402/785-2073
Contact: Robert E. Lookabaugh
Section I,III

Claritas/NPDC
P.O. Box 610
Ithaca, NY 14851
Ph. 607/273-8208
Section III,IV

Computab, Div. The Prima, Inc.
40 Old State Rd., #203
Ballwin, MO 63021
Ph. 314/391-3383
Fax 314/391-3299
Contact: Bill Korth
Section I,II

Computer Associates, Inc.
1 Computer Associates Plz.
Islandia, NY 11788
Ph. 516/342-5224
Section IV

Computers for Marketing Corporation
547 Howard Street
San Francisco, CA 94105
Ph. 415/777-0470
Fax 415/777-3128
Contact: Leif Gjestland

Branch:
    126 Fifth Ave., Ste. 1501
    New York, NY 10011
    Ph. 212/627-7730
    Contact: Joyce Rachelson

    Kettering Twr., Ste. 1820
    Dayton, OH 45423
    Ph. 513/228-2652
    Contact: Bill Springer

    1800 Grant St., Ste. 370
    Denver, CO 80203
    Ph. 303/860-1811
    Contact: Tom Leaf
Section I, II, III, IV

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World Trade Center, Ste. 7967
New York, NY 10048
Ph. 212/524-7760
Contact: Karen Feeks
Section II, III, IV

Consulting Hrdwre. & Processing, Inc.
1393 Old Trenton Road
Trenton, NJ 08690
Ph. 609/586-8577
Contact: Bob Reid
Section I, III, IV

Consumer Pulse, Inc.
725 South Adams
Birmingham, MI 48011
Contact: Karen Miller
Ph. 800/336-0159 or 313/540-5330
Fax 313/645-5685
Contact: Richard Miller

Branch:
    4301 Ridge Road
    Cleveland, OH 44144
    Ph. 216/351-4644
    Fax 216/351-7876
    Contact: Ron Kornokovich

    8310C Old Courthouse Rd.
    Vienna, VA 22182
    Contact: Tricia Barnes
Section I,II

Consumer Research Associates/Superooms
111 Pine St., 17th Flr.
San Francisco, CA 94111
Ph. 415/392-6000
Fax 415/392-7141
Contact: Mike Mallonee
Section I, II

Doris J. Cooper & Ascts., Ltd.
1 Bridge Street
Irvington, NY 10533
Ph. 914/591-4731
Fax 914/591-4659
Contact: Doris J. Cooper
Section I
(See advertisement on page 39)

Coremat, Inc.
337 Market St.
Saddlebrook, NJ 07657
Ph. 201/368-7898
Contact: Dan Wojdyla
Section I

Corporate Research
106 Fairidge Ct.
Jamestown, NC 27282
Ph. 919/884-8614
Fax 919/884-1977
Contact: John Deuterman
Section I

CRC Information Systems, Inc.
435 Hudson Street, 7th Flr.
New York, NY 10014
Ph. 212/620-5678
Fax 212/924-9111
Contact: Mary Wang

Branch:
    70 E.Lake St.
    Chicago, IL 60601
    Ph. 312/443-1120
    Fax 312/443-1349
    Contact: Anthony Pacenti

    61 Wilton Road
    Westport, CT 06880
    Ph. 203/222-0838
    Fax 203/222-7713
    Contact: Jeffrey Goldman
SectionI,II,III,IV

Creative Research Systems
15 Lone Oak Center
 Petaluma, CA 94952
Ph. 707/765-1001
Fax 707/768-1068
Contact: Lisa M. Bacon
Section I,II, III
(See advertisement on page 40)

Crunch Software Corp.
7677 Oakport Rd., #470
Oakland, CA 94621
Ph. 510/562-9900
Fax 510/562-9919
Contact: Robert Wiles
Section III

Cybernetic Solutions Co.
3479 W. 7480 So.
Salt Lake City, UT 84084
Ph. 801/568-1190
Contact: Kent Francis
Section III

Data Lab Corp.
7333 North Oak Park Ave.
Niles, IL 60648
Ph. 708/647-6678
Contact: Maurice Girardi
Section I, II

Datalogics
P.O. Box 287
Solebury, PA 18963
Ph. 215/794-7486
Fax 215/794-3177
Contact: John Jeter
Section I, II

Datan, Inc.
301 No. Harrison, #482
Princeton, NJ 08540
Ph. 609/921-6098
Fax 609/921-6731
Contact: Michael Stentz
Section I, II, III, IV

Datanetics
114 No. Beatty St.
Pittsburgh, PA 15206-3002
Ph. 412/363-3282
Contact: Jerry Lisovich
Section I, II, III

Data Probe/Datatab
80 Fifth Ave., 6th Flr.
New York, NY 10011
Ph. 212/255-3355
Section I,III

Data Recognition Corporation
5900 Baker Road
Minnetonka, MN 55345
Ph. 612/935-5900 or 800/826-2368
Fax 612/935-1435
Contact: Wayne M. Serie

Branch:
    P.O. Box 1167
    Iowa City, IA 52246
    Ph. 319/339-8011
    Fax 319/339-8010
    Contact: Patrick Hensel
Section I,II

DataSource
P.O. Box 80432
Indianapolis, IN 46280-0432
Ph. 317/843-3939
Fax 317/843-8638
Section I, II

DataStar, Inc.
384 Main St.
Waltham, MA 02154
Ph. 617/647-7900
Fax 617/647-7739
Contact: Ellie Smerlas
Section I,II

Data Tabulating Service, Inc.
3323 Chamblee-Dunwoody Rd.
Chamblee, GA 30341
Ph. 404/455-0114
Fax 404/458-8926
Contact: Beth Bearsto
Section I, II

Data Vision Research, Inc.
29 Emmons, Bldg. G1
Princeton, NJ 08540
Ph. 609/987-0565
Contact: Ron Vangi
Section I, II

Delphus, Inc.
103 Washington St., Ste. 348
Morristown, NJ 07960
Ph. 201/267-9269
Fax 201/285-1228
Contact: Hans Levenbach
Section II, III

Devcom Mid-America Inc.
2603 W. 22nd St., Ste. 23
Oak Brook, IL 60521
Ph. 708/574-3600
Fax 708/572-0508
Contact: Ronald Diener
Section IV

DigiSoft Computers
248 E. 92nd Street
New York, NY 10128
Ph. 212/289-0991
Contact: Betsy Schrott
Section III

Donnelley Demographics
70 Seaview Ave/P.O. Box 10250
Stamford, CT 06904
Ph. 203/353-7474
Fax 203/353-7276

Branch:
    1901 So. Meyers Road
    Oakbrook Terrace, IL 60181
    Ph. 708/495-1211

    2401 E. Katella Avenue
    Anaheim, CA 92806
    Ph. 714/978-1122
Section III

Enertronics Research, Inc.
1801 Beltway Dr.
St. Louis, MO 63114
Ph. 314/427-7578
Contact: Steve Andes
Section III

Equifax Nat'l. Decision Systems
539 Encinitas Blvd.
Encinitas, CA 92024
Ph. 619/942-7000
Fax 619/944-9543
Section III, IV

Expert Choice, Inc.
4922 Ellsworth Ave.
Pittsburgh, PA 15213
Ph. 412/682-3844
Contact: Rozann Whitaker
Section III

Fassino Associates
1 Veterans Square
Media, PA 19063
Ph. 215/516-4210 or 800/854-0019
Fax 215/566-4252
Contact: Michael Fassino
Section II

Ferox Microsystems, Inc.
901 No. Washington Street, #204
Alexandria, VA 22314
Ph. 703/684-1660
Section III

FirstMark Technologies Ltd.
600-14 Concourse Gate
Ottawa, Ontario, Canada K2E 7S8
Ph. 800/387-7335 or 613/723-8020
Fax 613/723-8048
Contact: Lucienne Dumoulin
Section II,III
(See advertisement on page 41)

Fisher Ascts./Uniscore, Inc.
P.O. Box 3204
Englewood, CO 80155-3204
Ph. 800/759-7615
Fax 303/237-5047
Contact: Millard T. Fisher

FMR Associates
6095 East Grant Rd.
Tucson, AZ 85712
Ph. 602/886-5548
Fax 602/886-0245
Contact: Jess De Vaney
Section I,II,III

Geographic Data Technology, Inc.
13 Dartmouth College Highway
Lyme, NH 03768
Ph. 603/795-2183
Contact: Neil Wheelwright
Section III

Geographic Decision Support Systems
Ste. 8, 674 Kingston Rd.
Toronto, Ontario Canada M4E 1R4
Ph. 416/693-9054
Fax 416/693-7893
Contact: Dr. David Brusegard
Section II,III

GeoOuery Corporation
P.O. Box 206
Naperville, IL 60566
Ph. 708/357-0535
Fax 708/717-4254
Contact: Michael Demeyer
Section III

Hancock Information Group
2180 West S.R. 434, Ste. 3170
Longwood, FL 32779
Ph. 407/682-1556
Fax 407/682-0025
Contact: Tina Storey
Section I,II

Hawthorne Software Co.
P.O. Box 35
Hawthore, NJ 07507
Ph. 201/304-0014
Contact: Linda Lido
Section III

The Idea Works, Inc.
607 Jackson St.
Columbia, MO 65203
Ph. 314/875-5827
Fax 314/875-5812
Contact: Edward Mirielli
Section II,III

I M A, Inc.
6527 Main Street
Trumbull, CT 0611
Ph. 203/261-4777
Section IV

Imagisys, Inc.
60 Rome St.
Farmingdale, NY 11735
Ph. 516/420-4770
Contact: Herb Rubinsky
Section I,II,III

Immediate Quality Data
5775 So. Bay Rd.
Cicero, NY 13039
Ph. 315/458-9320
Contact: John McCarthy
Section I, II
(See advertisement on page 41)

IMSI
1938 Fourth Street
San Rafael, CA 94901
Ph. 415/454-7101
Fax 415/454-8901
Contact: Bob Mayer
Section III

Information Resources, Inc.
200 Fifth Ave.
Waltham, MA 02154
Ph. 617/890-1100
Section III, IV

Intera Tydac Technologies Inc.
2 Gurdwara Rd., Ste. 210
Nepean, Ontario, Canada K2E 1A2
Ph. 613/226-5525
Fax 613/226-3819
Contact: Patti Murphy

Branch:
    Tydec Technologies Corp.
    1655 No. Ft. Myer Dr., #500
    Arlington, VA 22209
    Ph. 703/522-0773
    Fax 703/522-5189
Section III,IV

International Data Corp.
1884 Lackland Hill Pkwy., #3
Maryland Heights, MO 63043
Ph. 314/432-7866
Fax 314/432-5960
Contact: Gayle Myers
Section I

IRA
701 No. Plano Rd.
Richardson, TX 75081
Ph. 214/690-4493
Contact: Andy Keedy
Section I

R. Isaacs Computing Ascts., Inc.
734 Walt Whitman Road
Melville, NY 11747
Ph. 516/427-1444
Fax 516/427-1455
Contact: Richard Isaacs
Section I, II

JRP Marketing Research Services, Inc.
100 Granite Dr., Terrace Level
Media, PA 19063
Ph. 215/565-8840
Fax 215/565-8870
Contact: Paul R. Frattaroli
Section I

KG Tabs
200 Park Ave. So., Ste. 818
New York, NY 10003
Ph. 212/674-2323
Contact: Sally Krusch
Section

Landis Group
1551 Forum Pl.
W. Palm Beach, FL 33401
Ph. 407/684-3636
Fax 407/478-4457
Contact: Robert Posten
Section III

Leadtrack Services
P.O. Box 862215
Marietta, GA 30062
Ph. 404/594-7860
Fax 404/594-1289
Contact: Norman R. Koltys
Section III

Leibowitz Market Research Ascts.
Qne Parkway Pl./Ste. 110
Charlotte, NC 28217
Ph. 704/357-1961
Fax 704/357-1965
Contact: Teri Leibowitz
Section III

Lincoln Systems Corporation
P.O. Box 391
West Ford, MA 01886
Ph. 508/692-3910
Contact: Mike Harfe
Section II,III

LPC, Inc.
4343 Commerce Ct., #500
Lisle, IL 60532-3618
Ph. 708/505-0572
Fax 708/505-5948
Section IV

M. Lynch Company
80 Fifth Ave.
New York, NY 10011
Ph. 212/243-9022
Fax 212/989-2234
Contact: Marguerite Lynch
Section I

Macro*World Research Corp.
4265 Brownsboro Rd., #170
Winston-Salem, NC 27106
Ph. 919/759-0600
Fax 919/759-0636
Contact: Douglas A. Graham
Section III

Daniel Mallett Associates
300 Central Park West
New York, NY 10024
Ph. 212/724-9877
Section III

Management Science Associates/
Market Science Associates
6565 Penn Avenue
Pittsburgh, PA 15206-4490
Ph. 412/362-2000
Fax 412/363-5598
Contact: Jim Stangl

Branches:
    10600 W. Higgins Rd., #203
    Rosemont, IL 60018
    Ph. 708/390-7090
    Fax 708/390-7095
    Contact: Shirley Valko

    Century Plaza 2000, #333
    Columbia, MD 21044
    Ph. 410/997-3660
    Fax 410/997-3674
    Contact: Laurie Wachter

    Market Science Associates
    1560 Broadway, Ste. 300
    New York, NY 10036
    Ph. 212/398-9100
    Fax 212/398-9121
    Contact: Daniel Ray
Section I, II, III, IV

Manugistics
2115 E. Jefferson Street
Rockville, MD 20850
Ph. 301/984-5000
Fax 301/984-5094
Contact: Lynn Wishard
Section II,III

MapInfo Corp.
200 Broadway
Troy, NY 12180
Ph. 518/274-6000
Fax 518/274-6066
Section III

M/A/R/C, Inc.
P.O. Box 650083
Dallas, TX 75265-0083
Ph. 214/506-3400
Contact: Mike Reddington
Section III, IV

Maritz Marketing Research
1297 No. Highway Drive
St. Louis County, MO 63099
Ph. 314/827-1610
Fax 314/827-3224
Contact: Bill Lewellen, Pres.

Branch:
    (Performance Measurement Group)
    St. Louis, MO
    Ph. 314/827-2417
    Contact: Mike Phillips

    Atlanta, GA
    Ph. 404/551-6450
    Contact: Jack Carew

    Bolingbrook, IL
    Ph. 708/759-0700
    Contact: Michael Brereton

    Redwood City, CA
    Ph. 415/802-4101
    Contact: John Glazier

    New York, NY
    Ph. 212/983-7575
    Contact: Steve Wolf

    Bloomington, MN
    Ph. 612/885-3885
    Contact: Lynn M. Newman

    Clark, NJ
    Ph. 908/388-4800
    Contact: Sandy Hoffman

    Artesia, CA
    Ph. 310/809-0500
    Contact: Robert Q. Loper

    Agri./Ind. (St. Louis)
    Ph. 314/827-2305
    Contact: Roy Cleveland

    Troy, MI
    Ph. 313/643-6699
    Contact: Robert P. Stephenson

    Gardena, CA (Automotive)
    Ph. 213/323-2882
    Contact: Carolyn H. Garfein

    Toledo, OH
    Ph. 419/841-2831
    Contact: Ron Lipovsky
Sections I, II, III
(See advertisement on page 2)

Market Action Research Software
16 W. 501 58th St., #21-A
Clarendon Hills, IL 60514-1740
Ph. 708/986-0830 or 800/998-0830
Fax 708/986-0801
Contact: Dr. Betsy Goodnow
Section II, III

Marketeam Associates
1807 Park 270 Drive, #300
St. Louis, MO 63146
Contact: David Tugend
Ph. 314/878-7667
Section I, II

Marketing Information Systems
1840 Oak Avenue, 4th Flr.
Evanston, IL 60201
Ph. 708/491-3885
Fax 708/491-0682
Contact: Tom Nash
Section III, IV

Marketing Metrics, Inc.
305 Route Seventeen
Paramus, NJ 07652
Ph. 201/599-0790
Contact: Joseph Wyks
Section III

Marketing Software, Inc.
1233 N. Mayfair Rd., Ste. 100
Wauwatosa, WI 53226
Ph. 414/778-3737
Contact: T.R. Rao
Section I, II, III

Marketing Systems Group
Scott Plaza II, Suite 630
Philadelphia, PA 19113
Ph. 215/521-6747
Fax 215/521-6672
Contact: Amy Starer
Section III
(See advertisement on page 61)

MarketPlace Research, Inc.
7800 Cooper Rd., #202
Cincinnati, OH 45242
Ph. 513/891-8891
fAX 513/891-8897
Contact: Greg Widmeyer
Section II

Market Power, Inc.
101 Providence Mine Rd.,# 104
Nevada City, CA 95959
Ph. 916/265-5000
Section III

Market Probe International, Inc.
19 West 44th St., #1004
New York, NY 10036
Ph. 212/869-6262
Fax 212/869-6593
Section I,II,III,IV

Mathmatica Policy Research, Inc.
P.O. Box 2393
Princeton, NJ 08543-2393
Ph. 609/799-3535
Fax 609/799-0005
Contact: George J. Carcagno

Branch:
    600 Maryland Ave., S.W., Ste. 550
    Washington, DC 20024-2412
    Ph. 202/484-9220
    Contact: Harold Beebout
Section I,II

Matrix, Inc.
3490 US Route 1
Princeton, NJ 08540
Ph. 609/452-0099
Contact: Jacob Katz
Section I, II, III

Microtab, Inc.
380 Market Place
Roswell, GA 30075
Ph. 404/552-7856
Fax 404/552-7719
Contact: Larry Hills
Section I,II,III
(See advertisement on page 43)

Mid-America Research, Inc.
999 N. Elmhurst Rd.
Mt. Prospect, IL 60056
Ph. 708/870-6262
Fax 708/870-6236
Contact: Beverly Burns
Section I,II

MPSI Systems, Inc.
8282 So. Memorial Dr.
Tulsa, OK 74133
Ph. 918/250-9611
Contact: Joseph Perrault
Section IV

Gary Mullet Associates, Inc.
Ste. 4, 2399 Highway 29 South
Lawrenceville, GA 30244
Ph. 404/339-0392
Contact: Gary Mullet
Section II

NCSS
329 N 1000 E
Kaysville, UT 84037
Ph. 801/546-0445
Fax 801/546-3907
Contact: Jerry Hintze
Section III

New Dimensions Data Group
19 W. 34th St.
New York, NY 10001
Ph. 212/947-8177
Contact: Jerry Katz
Section I

PC-MDS
660 A Tnrb.
Provo, UT 84602
Ph. 801-378-5569
Fax 801/378-5984
Contact: Scott Smith
Section III

Perfect Data
2015 W. Cactus Rd., Ste. 215
Phoenix, AZ 85029-2792
Ph. 800/683-2303 or 602/861-2303
Fax 602/870-0221
Contact: Mark Yannone
Section I

Pericles Software
210 1/2 Louisiana Avenue
Perrysburg, OH 43551
Ph. 419/872-0966 or 419/872-0441 (Tech.)
Fax 419/872-0966
Contact: Michael J. Logan
Section I, III
(See advertisement on page 53)

Perreault & Associates
2104 North Lakeshore Dr.
Chapel Hill, NC 27514
Ph. 919/929-7921
Contact: William Perrault
Section IV

Pine Company
1607 16th Street
Santa Monica, CA 90404
Ph. 310/453-0633
Fax 310/453-3969
Contact: Ben Pine
Section I,II,III

Pizzano & Company, Inc.
800 West Cummings Park
Woburn, MA 01801
Ph. 617/935-7122
Fax 617/935-4473
Contact: Christal Changelian
Section II,III

Precision Field Services, Inc.
7900 N. Milwaukee
Niles, IL 60648
Ph. 708/966-8666
Fax 708/966-9551
Contact: Scott Adelman
Section I

Principia Products
1506 McDaniel Dr.
West Chester, PA 19380
Ph. 215/429-1359 or 800/858-0860
Fax 215/430-3316
Contact: Victor Berutti
Section III

Processing Consultants In Mktg.
410 Broad Ave., #101
Palisades Park, NJ 07650
Ph. 201/944-5585
Section I

Productivity Consulting Services
1749 Fairmont Street
New Kensington, PA 15068
Ph. 412/339-4776
Contact: Dara Kubiak
Section III

Pros & Cons, Inc.
6917 Arlington Rd., Ste. 215
Bethesda, MD 20814
Ph. 301/951-8441
Fax 301/951-3362
Contact: Peter Van Brunt
Section III

P-STAT, Inc.
230 Hopewell-Lambertville Rd.
Hopewell, NJ 08525-2809
Ph. 609/466-9200
Fax 609/466-1688
Contact: Sebbie Buhler
Section I,II,III,IV
(See advertisement on page 44)

Pulse Analytics, Inc.
152 Jeffers Court
Ridgewood, NJ 07450
Ph. 201/447-1395
Fax 201/447-2104
Contact: Stanley I. Cohen
Section II,III

Quality Coding, Inc.
130 Jane St.
New York, NY 10014
Ph. 212/243-0004
Fax 212/627-4363
Contact: MacGregor Suzuki

Branch:
733 Canal St.
Stamford, CT 06902
Ph. 203/353-8112
Fax 203/353-8106
Contact: Lyne Johnson
Section I,III

Quality Information Center
1374 Richmond Rd.
Staten Island, NY 10304
Ph. 718/987-0893
Fax 718/667-8005
Contact: Dennis P. Burke
Section I,III

Quantime
67 Maygrove Road
London, UK NW 6 2EG
Ph. 441/625-7222
Fax 441/625-5297

Branch:
    545 8th Avenue, 18th Flr.
    New York, NY 10018
    Ph. 212/268-4800
    Contact: Joseph Marinelli

    4010 Executive Park Dr.,# 236
    Cincinnati, OH 45241
    Ph. 513/563-8800
    Contact: Sharon Jordan

Section I, II, III, IV
(See advertisement on page 3)

Quantum Consulting, Inc.
2030 Addison St., Ste. 410
Berkeley, CA 94704
Ph. 510/540-7200
Fax 510/540-7268
Contact: Robert Uhlaner
Section I,II,III

Questar Data Systems, Inc.
2905 W. Service Road
Eagan, MN 55121
Ph. 612/688-0089
Fax 612/688-0546
Contact: Sheila Coffey
Section I, II

Raosoft, Inc.
6645 N.E. Windermere Rd.
Seattle, WA 98115
Ph. 206/525-4025
Fax 206/525-4947
Contact: Catherine McDole Rao
Section I,II,III
(See advertisement on page 44)

ReData, Inc.
6917 Arlington Rd., #215
Bethesda, MD 20814
Ph. 301/951-4484
Contact: Peter Van Brunt
Section I, II

Renaissance Rsch. & Consulting
127 East 59th Street
New York, NY 11375
Ph. 212/319-1833
Fax 212/319-1833
Contact: Paul M. Gurwitz

Branch:
    120 Sundale Road
    Accord, NY 12404
    Ph. 914/626-3115
    Fax 914/626-8247
    Contact: Susan H. Metzger
Section II

Research Data Analysis
450 Enterprise Ct.
Bloomfield Hills, MI 48302
Ph. 313/332-5000
Fax 313/332-4168
Contact: Frank Forkin
Section I,II,III

Research Results, Inc.
967 South St.
Fitchburg, MA 01420
Ph. 508/345-5510
Fax 508/345-5335
Contact: John Zarrella

Branch:
    IDE/Research Results
    596 Washington St.
    Whitman, MA 02382
    Ph. 617/447-3282
    Fax 617/447-5641
    Contact: David Campbell
Section I

The Sachs Group, Ltd.
1800 Sherman Avenue
Evanston, IL 60201
Ph. 708/475-7526
Fax 708/475-7830
Contact: Janet Guptill
Branch:
    1700 Montgomery St., #320
    San Francisco, CA 94111
    Ph. 415/397-1262
    Fax 415/398-2821

    7111 Valley Green Road
    Ft. Washington, PA 19034
    Ph. 215/836-0110
    Fax 215/836-0105
Section II,III

Sales Technologies
175 Canal St., 1st Flr.
Manchester, NH 03101
Ph. 603/623-5877
Contact: Carol Jacobs
Section III

The Salinon Corp.
7424 Greenville Ave., Ste. 115
Dallas, TX 75231
Ph. 214/692-9091
Fax 214/692-9095
Contact: Michael L. Carr
Section III

Sammamish Data Systems, Inc.
1813 130th Ave. N.E., Ste. 216
Bellevue, WA 98005
Ph. 206/867-1485
Fax 206/861-0184
Contact: Richard Schweitzar
Section III

SAS Institute Inc.
SAS Campus Drive
Cary, NC 27513-2414
Ph. 919/677-8000
Fax 919/677-8123
Section III, IV

Sawtooth Software, Inc.
1007 Church St., Ste. 402
Evanston, IL 60201
Ph. 708/866-0870
Fax 708/866-0876
Contact: Suzanne Weiss
Section III
(See advertisement on page 54)

Saxe Research
5248 Pizzo Ranch Rd.
La Canada, CA 91011
Ph. 818/952-2446
Fax 818/952-8117
Contact: Robert Saxe
Section II,III

Paul Schrock & Associates
7234 Moorgate Rd.
Indianapolis, IN 46250
Ph. 317/842-3394
Contact: Paul Schrock
Section I,II

Scientific Computing Associates
913 W. Van Buren St., #3H
Chicago, IL 60607
Ph. 312/455-0222
Fax 312/455-1652
Contact: William Lattyak
Section II,III,IV

The Scientific Press
651 Gateway Blvd., #1100
So. San Francisco, CA 94080
Ph. 415/583-8840
Contact: Tom Cosgrove
Section III

SDR, Inc.
2251 Perimeter Park Drive
Atlanta, GA 30341
Ph. 404/451-5100
Fax 404/451-5096
Contact: David Feldman

Branch:
    500 North Dearborn St., #1200
    Chicago, IL 60610
    Ph. 312/661-0825
    Contact: Jim Miller
Section I,II,IV
(See advertisement on page 64)

Senecio Software, Inc.
720 Wallace Ave.
Bowling Green, OH 43402
Ph. 419/352-4371
Fax 419/352-4281
Contact: Jerry Wicks
Section III

Allan D. Shocker
Carlson School of Management,
Univ. of Minn.
Minneapolis, MN 55455
Ph. 612/626-7258
Fax 612/626-8328
Contact: Allan D. Shocker
Section IV

Slater Hall Information Products
1301 Pennsylvania Ave. NW, Ste. 507
Washington D.C. 20004
Ph. 202/93-2666
Contact: George Hall
Section II,III

Smart Software Inc.
4 Hill Road
Belmont, MA 02178
Ph. 617/489-2743
Fax 617/489-2748
Contact: Ellen Fletcher
Section III

Software For Research
599 E. 7th St., #1A
Brooklyn, NY 11218
Ph. 718/941-5723
Contact: Barry Cohen

Spring Systems
P.O. Box 10073
Chicago, IL 60610
Ph. 312/275-5273
Contact: John Pavasars
Section III

SPSS, Inc.
444 No. Michigan Avenue
Chicago, IL 60611
Ph. 312/329-3500
Fax 312/329-3668
Contact: Sales Dept.

Branch:
    SPSS Federal Systems
    12030 Sunrise Valley Drive
    Reston, VA 22091
    Ph. 703/391-6020
    Fax 703/391-6002
    Section I,II,III, IV
(See advertisement on page 5)

Stamford Tabulating Service
568 Hunting Ridge Road
Stamford, CT 06903
Ph. 203/322-5573
Contact: Lorraine Horowitz
Section I

STARS
235 Great Neck Rd.
Great Neck, NY 11021
Ph. 516/829-1800
Fax 516/829-1823
Contact: Paul Capozzi

Branch:
    12720 Hillcrest Rd.
    Dallas, TX 75230
    Ph. 214/490-1818
    Contact: Allen Falk
Section I,III

Statistical Innovations Inc.
375 Concord Ave.
Belmont, MA 02178
Ph. 617/489-4490
Contact: Frank Derrick
Section II, III, IV

StatPac, Inc.
3814 Lyndale Ave. So.
Minneapolis, MN 55409
Ph. 612/822-8252
Fax 612/822-1708
Contact: David Walonick
Section I,II,III
(See advertisement on page 47)

William Steinberg Consulting, Inc.
P.O. Box 1754
Champlain, NY 12919
Ph. 514/483-6954
Fax 514/483-6660
Contact: William Steinberg
Section III

Stolzberg Research, Inc.
3 Seabrook Court
Stony Brook, NY 11790
Ph. 516/751-5277
Fax 516/689-6671
Contact: Mark E. Stolzberg
Section III

Strategic Decisions Grp.
2440 Sand Hill Road
Menlo Park, CA 94025
Ph. 415/854-9000
Contact: Laura Hunter
Section III

Strategic Mapping
3135 Kifer Road
San Jose, CA 95051
Ph. 408/970-9600
Fax 408/970-9999
Contact: Craig Silverman
Section III

STS, Inc.
1218 Massachusetts Avenue
Cambridge, MA 02138
Ph. 617/547-6475
Contact: Arthur Spar
Section I, II

Sulcer Services for Mktg. Rsch.
291 8th St., Ste. 2W
Jersey City, NJ 07302-1946
Ph. 201/420-5090
Fax 201/420-5090
Contact: Tom Sulcer
Section I,II,III

SumQuest Survey Software
908 Niagara Falls Blvd.
North Tonawanda, NY 14120
Ph. 416/599-0404
Fax 416/979-5266
Contact: Ross Macnaughton
Section III

Survey Analysis
13428 Miles Standish Port
Palm Beach Gardens, FL 33420
Ph. 407/7754-1460 or 800/541-2735
Fax 407/775-1474
Section I,II

Survey Network Data Processing
242 Hendrickson Ave.
Lynbrook, NY 11563
Ph. 516/599-6064
Fax 516/599-2791
Contact: Philip Bennis
Section I,II

Systat, Inc.
1800 Sherman Avenue
Evanston, IL 60201
Ph. 708/864-5670
Fax 708/492-3567
Contact: Keith Reehl
Section I,II,III, IV

Tabulyzer
Irwin P. Sharpe & Ascts.
50 Greenwood Avenue
West Orange, NJ 07052
Ph. 201/731-7800
Contact: Jill Herman
Section III

T/C/A
461 Park Avenue South
New York, NY 10016
Ph. 212/679-3111
Fax 212/679-3174
Contact: Roy Hardiman
Section I, III, IV

Teller Tab Services, Inc.
26 Pearl Street
Norwalk, CT 06851
Ph. 203/849-8287
Fax 203/848-0238
Contact: Janet Teller
Section I,II

Terra Rsch. & Computing
8 Florence Place
Troy, NY 12180
Ph. 518/235-8391
Contact: Scott Danielsen

Branch:
    615 E. 11 Mile Rd., #34
    Royal Oak, MI 48067
    Ph. 313/398-6236
    Contact: N.J. Stoyanoff
Section I,II,III

Tetrad Computer Applications Ltd.
3873 Airport Way, Box 9754
Bellingham, WA 98227-9754
Ph. 206/734-3318
Fax 206/734-4005
Contact: Wilson Baker
Section III

Touch Base Computing
106 Woodcrest Drive
Rome, GA 30161-4702
Ph. 706/234-4260
Contact: Tom Boylan
Section I,II,III

The Uncle Group
3490 U. S. Rte. 1
Princeton, NJ 08540
Ph. 800/229-6287
Fax 609/452-8644
Contact: Tom Reeder

Branch:
    P.O. Box 11165
    Chicago, IL 60611
    Ph. 312/321-8165
    Fax 312/321-0607
    Contact: Bruce Tedesco
Section III,IV

Viking Software, Inc.
4808 E. 67th St., Ste. 100
Tulsa, OK 74136
Ph. 918/491-6144 or 800/324-0595
Fax 918/494-2701
Contact: Mike Brown
Section III

Vision Database Systems
351 Hiatt Drive
Palm Beach Gardens, FL 33418
Ph. 407/694-2211
Contact: Emil Bonaduce
Section III

Jan Werner Data Processing
60 East 8th Street
New York, NY 10003
Ph. 212/260-0012
Fax 212/979-8616
Contact: Jan Werner
Section I,III

Western Wats Center
288 West Center St.
Provo, UT 84601
Ph. 801/373-7735
Fax 801/375-0672
Contact: Ed Ledek
Section I

SECTION I
Data Proccssiug /Tabulation

DQRIS J. CQQPER & ASCTS.-Full service data processing including field check-in, edit code, proprietary computer assisted, verbatim coding, data entry, tabulation, statistics, graphics. Serving market research professionals since 1973.

CREATIVE RESEARCH SYSTEMS-Supplementary data entry and analysis services for survey system users.

IMMEDIATE QUALITY DATA-Coding, keypunching, tables, statistics, cross-tabs. Data on floppy or telecommunicated. Fast turnaround.

MARITZ MARKETING RESEARCH-Full service marketing research firm. Internal data processing and data entry staff. Custom data tabulation, CATI Interviewing.

MICROTAB, INC.-Microtab, Incorporated offers full service data processing in Atlanta, Georgia. Full service is provided, from data entry to presentation quality tables. Data entry and coding services available. We can read data generated by Ci2, CfMC, Oscar, Query, etc. We can test already compiled data (tables) from statistical significance, keying areas where differences are found and annotating the results on the table. We can also provide overhead transparencies, slides or paper in black and white or in color.

P-STAT INC.-The P-STAT® program was begun in the early 1960's for analyzing pschopharm-acological data. The original authors, Roald and Shirrell Buhler, left Princeton University Computer Center in 1979 to form P-STAT, Inc. Today, P-STAT is used internationally on over 50 types of computers (PCs, UNIX workstation/servers, and mini/mainframes running proprietary operating systems).

QUANTIME-Offers full data entry, data tabulation services. Data is cleaned, weighted and tabulated using Quantum, our proprietary data tabulation software. Clients can receive data in hard copy or magnetic format. Studies may also be converted for use with Quanvert, our proprietary, PC based, interactive data analysis package.

SDR-Provides a full line of data processing and sampling services, targeted specifically to the marketing research industry. Services include data entry, coding, cross-tabulations, multivariate analyses, RDD samples, listed samples, database management, and mail survey outgo and return services.

CODING

The Accutab Co.
Analytical Computer Service, Inc.
Ardisson & Associates, Inc.
Atlantic Marketing Research Co., Inc.
Bernett Research Services, Inc.
Michael Blatt & Co.
Bradenton Data
CACI Marketing Systems
Computab, Div. The Prima, Inc.
Computers for Marketing Corp.
Consumer Pulse, Inc.
Doris J. Cooper & Ascts.
Corporate Research
CRC Information Sys.
Datan, Inc.
Datanetics
DataSource
DataStar, Inc.
Data Probe/Datatab
Data Recognition Corporation
Data Tabulating Service
FMR Associates
Hancock Information Group
Imagisys, Inc.
Immediate Quality Data
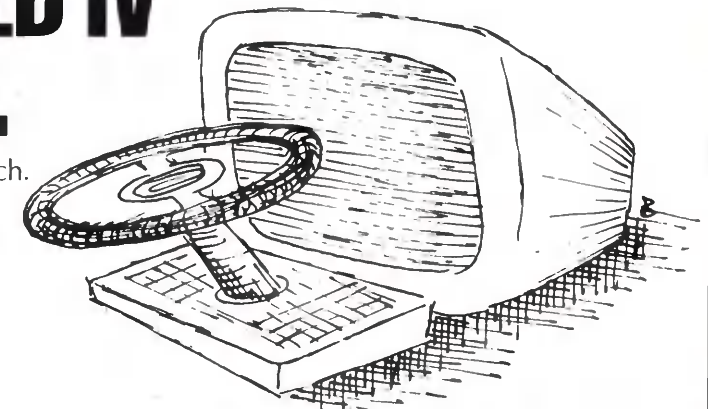
International Data Corp.
R. Isaacs Computing Ascts.
JRP Marketing Research Services, Inc.
M. Lynch Company
Market Science Associates
Market Probe International
Mathematica Policy Research
Mid-America Research, Inc.
Pine Company
Precision Field Services, Inc.
Quality Coding, Inc.
Quality Information Center
Raosoft, Inc.
Research Data Analysis
Research Results
Paul Schrock & Associates
SDR, Inc.
STARS
STS, Inc.
Sulcer Research Ascts.
Survey Analysis
Survey Network Data Proc.
Teller Tab Services
Western Wats Center

DATA ENTRY

The Accutab Co.
Acquadata Entry Services
Adapt, Inc.
Analytical Computer Service, Inc.
Ardisson & Associates, Inc.
Atlantic Marketing Research Co., Inc.
Batch Data Processing
Bernett Research Services, Inc.
Michael Blatt & Co.
Bradenton Data
Bruce Bell and Ascts.
Brunetti & Associates
Cascio Custom Tabs
Ceresco Marketing, Inc.
Coffman Systems, Inc.
Computab, Div. The Prima, Inc.
Computers for Marketing Corp.
Consulting Hrdwre. & Processing
Consumer Pulse, Inc.
Consumer Research Ascts.
Doris J. Cooper & Ascts.
Coremat, Inc.
Corporate Research
CRC Information Sys.
Creative Research Systems
Crunch Software Corp.
Data Lab Corp.
Datalogics
Datanetics
Datan, Inc.
Data Probe/Datatab
Data Recognition Corporation
DataSource
DataStar, Inc.
Data Tabulating Service
Data Vision Research
FMR Associates
Fisher Ascts./Uniscore, Inc.
Hancock Information Group
Imagisys, Inc.
Immediate Quality Data
International Data Corp.
IRA
R. Isaacs Computing Ascts.
JRP Marketing Research Services, Inc.
KG Tabs
Management Science Ascts.

Maritz Marketing Research
Marketeam Associates
Market Probe International
Mathematica Policy Research
Matrix, Inc.
Microtab, Inc.
Mid-America Research, Inc.
New Dimension Data Group
Perfect Data
Pine Company
Precision Field Services, Inc.
Processing Consultants In Mktg.
P-STAT, Inc.
Quality Coding, Inc.
Quality Information Center
Quantime
Questar Data Systems
Raosoft, Inc.
ReData, Inc.
Research Data Analysis
Research Results
Paul Schrock & Associates
SDR, Inc.
SPSS, Inc.
Stamford Tabulating Svce.
STARS
StatPac, Inc.
STS, Inc.
Sulcer Services
Survey Analysis
Survey Network Data Proc.
Teller Tab Svces.
Touch Base Computing
Vital Statistics
Western Wats Center

DATA TABULATION

The Accutab Co.
Alphastat Research Corporation
Analytical Computer Service, Inc.
Ardisson & Associates, Inc.
Atlantic Marketing Research Co.
Batch Data Processing
Bernett Research Services
Michael Blatt & Co.
Bolding Tab Service, Inc.
Bradenton Data
Brunetti & Associates
Cascio Custom Tabs
Ceresco Marketing, Inc.
Coffman Systems, Inc.
Computab
Computers for Marketing Corp.
Consulting Hardware & Processing
Consumer Pulse, Inc.
Consumer Research Ascts.
Doris J. Cooper & Ascts.
Coremat, Inc.
Corporate Research
CRC Information Sys.
Creative Research Systems
Crunch Software Corp.
Data Lab Corp.
Datalogics
Datan, Inc.
Datanetics
Data Probe/Datatab
Data Recognition Corporation
DataSource
DataStar
Data Tabulating Service
Data Vision Research
FMR Associates
Fisher Ascts./Uniscore, Inc.

Hancock Information Group
Imagisys, Inc.
IRA
R. Isaacs Computing Ascts.
JRP Marketing Research Services
KG Tabs
Management Science Ascts.
M/A/R/C, Inc
Maritz Marketing Research
Marketeam Associates
Marketing Software, Inc.
Market Probe International
Mathematica Policy Research
Matrix, Inc.
Microtab, Inc.
Mid-America Research, Inc.
New Dimension Data Group
Pericles Software
Pine Company
Precision Field Services
Processing Consultants In Marketing
P-STAT, Inc.
Quantime
Quantum Consulting
Questar Data Systems
Raosoft, Inc.
ReData, Inc.
Research Data Analysis
Research Results
Paul Schrock & Associates
SDR, Inc.
SPSS, Inc.
STS, Inc.
Stamford Tabulating Svce.
STARS
Sulcer Research Ascts.
Survey Analysis
Survey Network Data Proc.
Systat, Inc.
T/C/A
Teller Tab Svces.
Terra Rsch. & Computing
Touch Base Computing
Jan Werner Data Processing
Western Wats Center

SECTION II
Statistical Analysis

CREATIVE RESEARCH SYSTEMS-Statistical analysis of data for reports.

FIRSTMARK TECHNOLOGIES LTD.-Offers all forms of market data assembly and market data analysis, with specialized support for classification tree analysis.

MARITZ MARKETING RESEARCH-Statistical analysis experience with most multivariate methods (ANOVA, regression, factor, cluster, conjoint, etc.) plus proprietary.

MICRQTAB, INCQRPORATED-MT/stat is used by Microtab to perform, on any ASCII table, Chi-Square contingency table analysis, one or two-tailed tests for independent proportions. The results are annotated automatically on your tables. Dr. Gary Mullet is a consultant to Microtab, Inc.

Quirk's
MARKETING RESEARCH
Review

P.O. Box 23536
Minneapolis, MN 55423

P-STAT INC.-The P-STAT® program was begun in the early 1960's for analyzing pschopharmacological data. The original authors, Roald and Shirrell Buhler, left Princeton University Computer Center in 1979 to form P-STAT, Inc. Today, P-STAT is used internationally on over 50 types of computers (PCs, UNIX workstation/servers, and mini/mainframes running proprietary operating systems).

QUANTIME-Offers full statistical analysis services. staff size: 75+; Years in business: 10

SDR, Inc.-Provides a full line of statistical analysis sampling services, database management, and statistical consulting, targeted specifically to the marketing research industry.

SPSS,INC.-Founded in 1968, SPSS, Inc. provides statistical products and service solutions for marketing, quality improvement, scientific research, reporting and education. Its software products operate on most models of major computers. In addition to its Federal Systems Office in the Washington D.C. area, SPSS has eight international offices and distributors worldwide.

STATISTICAL ANALYSIS SERVICES

The Accutab Co.
Alphastat Research Corporation
Analytical Computer Service, Inc.
Analysis and Forecasting, Inc.
Analytic Consultants Intl.
Atlantic Marketing Research Co., Inc.
Batch Data Processing
Bernett Research Services
Lisette Berry Associates
Michael Blatt & Co.
BMDP Statistical Software, Inc.
CACI Marketing Systems
Cascio Custom Tabs
Computab, Div Prima, Inc.
Consumer Pulse, Inc.
Consumer Research Ascts.
CRC Information Sys.
Creative Research Systems
Data Lab Corp.
Datalogics
Datan, Inc.
Datanetics
Data Recognition Corporation
DataSource
Data Tabulating Service
Data Vision Research
Delphus, Inc.
Fassino Associates
FirstMark Technologies Ltd.
FMR Associates
Geographic Decision Support Systems
Hancock Information Group
The Idea Works, Inc.
IMA, Inc.
Immediate Quality Data
Imagisys, Inc.
R. Isaacs Computing Ascts.
Lincoln Systems Corporation
Management Science Ascts.
Manugistics

Maritz Marketing Research
Market Action Rsch. Software
Marketeam Associates
Marketing Software, Inc.
MarketPlace Research
Market Probe International
Mathmatica Policy Research
Matrix, Inc.
Microtab, Inc.
Mid-America Research, Inc.
Gary Mullet Ascts., Inc.
Pine Company
Pizzano & Co.
P-STAT INC.
Pulse Analytics
Quantime
Quantum Consulting
Questar Data Systems, Inc.
Raosoft, Inc.
ReData, Inc.
Renaissance Rsch. & Consulting
Research Data Analysis
SAS Institute, Inc.
Saxe Research
Paul Schrock & Associates
Scientific Computing Associates
SDR, Inc.
SPSS, Inc.
Stamford Tabulating Svce.
Statistical Innovations
StatPac, Inc.
STS, Inc.
Sulcer Research Ascts.
Survey Analysis
Survey Network Data Proc.
Systat, Inc..
Teller Tab Services
Terra Rsch. & Computing
Touch Base Computing

SECTION III SOFTWARE PROGRAMS FOR USE WITH PC-S

APIAN SQFTWARE, INC.-SURVEY PRO™ Award winning integrated survey software family offers a fast, easy, affordable way to conduct surveys. No database programming needed. Automated layout system generates desktop-publishing quality questionnaires easily. Fast analysis for tables, graphs, crosstabs, open-ended answers. Standard Edition or new Advanced Edition for Windows with data export, import and multiuser entry options. DECISION PAD® does weight-criteria multivariate decision analysis.

BRETTQN-CLARK-MCA+:Generates perceptual maps from data ranging from crosstabs thru conjoint. Produces highly-accurate maps on lasers and most printers. Fully interactive, point-and-shoot interface; includes special spreadsheet entry for cross-tabs. Uses various techniques of correspondence analysis.
CONJOINT DESIGNER:Menu-driven program produces designs for full-profile conjoint studies. Gives you a choice of designs along with guidelines for selection. Lets you customize designs, and evaluate the effects of any changes.
CONJOINT ANALYZER: Analyzes full-pro-

file conjoint data. Unique procedure shows the best way to model Price and other quantitative features. Fully interactive options for data cleaning, data entry, market simulation, and validation.
CONJOINT LINMAP: Non-metric program for the analysis of full-profile conjoint data. Uses mathematical programming methods to ensure optimum solution. Lets you constrain analysis procedure to increase study validity. Includes basic market simulator, data cleaning, and validation. Also analyzes tradeoff data.
SIMGRAF: Advanced stand-alone market simulator for conjoint studies. Allows user to perform virtually unlimited "what-if" analyses and competitive war games. Optimize price or product features with a few clicks of a mouse. Predict market shares for total market as well as individual market segments. Predict share of consumers buying each product, as well as the percentage buying none of the products. Run-time versions available for distribution to clients.
CONJOINT SEGMENTER: Uses recent theoretical advances to perform market segmentation with conjoint analysis data. Virtual memory techniques allow it to segment very large data sets. Point-and-shoot interface.
BRIDGER: Perform full-profile conjoint studies using large numbers of product/service features.

CREATIVE RESEARCH SYSTEMS-THE SURVEY SYSTEM: Analyses marketing, public opinion, customer satisfaction, employee attitude surveys. Handles mail, personal, phone, scanner, disk by mail or computer interviews. Records verbatim text and actual voice answers. Graphics network version, user friendly, free support.

FIRSTMARK TECHNOLOGIES LTD.-KnowledgeSEEKER is menu-driven software which employs algorithms that automate labor-intensive analysis tasks. It quickly produces profiles of the complex interrelationships that impact the subject of a study. Interactive features allow the user to direct and refine the analysis.

MARITZ MARKETING RESEARCH-MARITZ STATS: PC-based statistical package. Performs ten significance tests on summary data and analyzes frequency distributions. Sample size module calculates sample sizes and precisions for a variety of problems. Select-a-Stat module recommends appropriate statistical test for most situations. FREE for the asking.

MARKETING SYSTEMS GRQUP-GENESYS: Complete Random Digit Dialing (RDD) Sampling System for license on IBM compatible and Apple Macintosh PC's. Geographic capabilities down to the Zip Code level (e.g., State, County, ADI, DMA, MSA and Area Code /Exchange). Targeted samples for over 20 demographic variables, including associated incidence and coverage estimates. Custom print programs and interface to all major CATI systems included. Business Purging option available.
GENESYS-ID: Hardware/Software/Database

system for identifying and purging non-household numbers from RDD samples. GENESYS-ID operates without ringing into every household in the sample. Available for license on IBM compatible PC's.

MICROTAB, INC.-MICROTAB's cross tabulation software is available in three different editions, each designed with a specific range of needs in mind. You can perform all the necessary functions on your data in order to examine and analyze the data in a cross tabulated manner. Used by service bureaus, research suppliers, banks, newspapers, etc. Fast, flexible and comprehensive. Free demo disk. Free telephone support and enhancements. MICROTAB's MT/stat statistical analysis table software lets you perform, on any ASCII table, Chi-Square contingency table analysis, one or two-tailed tests for independent means and one or two-tailed tests for independent proportions. The results are annotated automatically on your tables. You can then print your tables with this information included. The software comes with a full screen text editor that allows you to create vertical blocks for moving, copying, or deleting banner points.

PERICLES SOFTWARE-TABHOUSE is a MacIntosh-based interactive tabulation, cross-tabulation and significance testing. PDE is a MacIntosh-based data entry with range checks, verification, unique ID's and interactive questionnaire design front-end.

P-STAT INC.-BASE SYSTEM features cluster, regression, quality control, factor and discriminant analysis; data and file management; crosstabulation; and report-writing capabilities. P-STAT features both a command language and front-end programmable MENU system (DOS and UNIX), online HELP, macros, a 4GL programming language, and interactive command EDITOR. File formats & interfaces supported include ASCII, Column Binary, DIF, dBase III-IV, SPSS/PC/X export, SAS Data step.
TABS MODULE features the SURVEY command and a Sample Balance program. SURVEY produces stub-and-banner displays with: unlimited respondents, 50 to 300 cards per respondent, 100+ banner points, true nets and subnets, weighting, filtering, ranking, summary statistics including Chi-Square, F-test, variance, median, mode and range, significance tests, unlimited questionnaire text, table of contents, transposed layouts, PostScript output. ADVANCED STATISTICS MODULE features four statistical commands: nonlinear regression, canonical correlation, ARIMA time series, and Survival Analysis (Life Table and Product Limit).
INFORMIX INTERFACE reads directly from an Informix database and creates a P-STAT system file from the selected records. The command may be called at any time within the P-STAT run. Informix numeric variable types are carried in P-STAT as double precision numeric. All other data types are carried in P-STAT as character variables.
DATA ENTRY MODULE is a fully interactive, screen oriented system for defining variables, entering data and revising files. Features

include: range checks, and allowable values, sequence, numbers, logical skip patterns, required variables, master case definitions, character values to 260 character in length, output to ASCII, DIF, dBase III-IV, SPSS/X/PC export file, SAS Data Step, and P-STAT system file.
PX-GRAPH MODULE is designed to produce high resolution business graphics including pie charts, plots and histograms from within the P-STAT package. Up to 10 scrolling windows (for text or graphics) are simultaneously available. Charts produced on color or monochrome monitors can be directed to any graphics device supported by X11.
PX-GRAPH runs under DECwindows, Motif and OpenLook on UNIX workstations.

QUANTIME-QUANTUM.PC: Editing and correction facilities for Binary/ASCII data. Weighting types: sample balancing, pre/post, projections. Handles hierarchical (trailer/panel) data. Table output: multiple level ranking; row, column, total and cumulative percentages; rank numbers, indices; row/table manipulation; T/Z tests, P&G required stats. Supports Postscript and standard laser printers. Interfaces with Quanquest, Quanvert and Quancept. Available on Multi-User 80386, and 640K MS-DOS PCs.
QUANVERT: Interactive data analysis for researchers. Tabulates any question (variable) in the database by any other. Filter tables on any answer or combination of answers from existing questions. Weighted or unweighted output. Creates new variables by combining/splitting parts of existing questions. Handles multiple projects simultaneously. Interfaces with Quantum. Available on Multi-User 80386, and 640K MS-DOS PCs.
QUANQUEST: Interactive questionnaire design system. Uses color windows and menus. Stores questions, groups of questions and entire questionnaires for use with new questionnaires. User enters text of questions and responses. Handles skip patterns and grid questions. Automatically assigns column and punches, generates printed questionnaire, CATI script, editing and tabulation specs. Interfaces with Quantum and Quancept. Available on 640K MS-DOS PCs.
QUANCEPT PC: CRT Interviewing System. Handles very large and complex questionnaires. Significant features are telephone number management, quota control, computer assisted coding, interviewer monitoring, and interactive topline tabs. Generates printed questionnaire and tabulation specs from script. Predictive-dialer interface available. Interfaces with Quanquest and Quantum. Available on Multi-User 80386 (up to 32 users) Can be used as CAPI system on 640K MS-DOS PCs.
QUINPUT: Streamlined define and punch data entry system. Features: menu driven real time data checking from user-defined data mask includes full range of mathematic and logic operators. Punch program features automatic code conversion, code and number repeat, column counting and delete functions. Full verification. Quinput requires no technical training. Output in quantum or plain text format. Available in DOS and Xenix.

RAOSOFT, INC.-SURVEY is a Windows-like, easy to use statistical database that provides flexible form design, forms-based entry(with mouse), 1-stroke statistical and graphical analysis, query, reports and mailmerge. Press a "T" to see a table, for example. Intuitive sample size selection, hypothesis testing, and random sample generation. Unlimited number of questions (fieldnames) and cases (records).
SURVEYFIRST provides the full Survey program up to 1000 records. It supports unlimited questions (fieldnames)-only the number of records is limited. All the other features of Survey are included and the add-on modules are completely compatible.
SURVEY-ENTRY is the data entry module for remote sites or network nodes. It provides form creation, data entry, data editing. Query for information retrieval, a data summary, phone dial-out and a Hot-key program interrupt. Data is appended to the parent Survey for analysis. There is no limit to number of cases or fieldnames.
UFILL™ similar to Survey-Entry but limited to data entry and data editing only. Ufill™ is designed for low-cost data entry, such as in telemarketing or political volunteer activity. Phone dial-out. Networkable and ideal for laptops. There is no limit to number of cases or number of fields.
USURVEY® is a run-time program designed for mail-out surveys or broadcast surveys on networks where users fill in the data. The screen shows a replica of the form. Confidentiality is assured. Multiple surveys may be put on a disk. There is no limit to number of cases or number of fields.
EZREPORT is a user friendly report writer for Survey databases or any dBase.DBF file. Programming experience is not required to generate reports because Raosoft's Intuitive Command Structure (ICS) is self teaching. EZReport provides more advanced report writing capacity than Raosoft Survey's internal report writer. There is no limit to cases or fields.
SURVEY-TOOLS is a collection of utilities for database or file management. The user may delete duplicates, match and replace fields (for updating files), append data from Survey data entry modules, and copy database files. It will generate household lists for mailings. Often used in telemarketing and in political campaigns to keep track of voter registration and volunteer activity.

SAWTOOTH SOFTWARE, INC.-Ci2 SYSTEM: Lets you create and administer questionnaires using a PC. Ci2 gives the questionnaire author complete flexibility in presentation format and questions sequencing. Writer controls question type, skip patterns, randomizations, acceptable responses and screen colors. The system provides summary information so that surveys can be monitored while in progress. Data can be analyzed by most tab and statistics packages.
Ci3 SYSTEM FOR ADVANCED COMPUTER INTERVIEWING: Offers the same types of capabilities for computer-interactive interviewing as the Ci2 System. But, Ci3 is an advanced system, designed for Ci2 "power

Cross Tabulations & Data Entry on the Macintosh®?
Absolutely - With TabHouse® 1.5!

The Pericles Data Entry (PDE) Utility

The PDE utility is available only to users of TabHouse® and consists of two parts. PDE setup allows Mac® users to quickly create electronic questionnaires for data entry. There are 7 types of screens possible:

1) Information screens: contains interviewer instructions or other text, *2) Verbatim screens:* variable length text collection (up to 255 characters), *3) Alphanumeric screens:* alphabetic and/or numeric data is collected. Integer numeric input can be constrained to lie within a given range,

4) Radio button screens: provide rapid entry of a single value from a list of from 2-20 alternatives, *5) Check box screens:* allows one to indicate the presence or absence of up to 20 attributes, *6) Shared scale & 7) Bipolar (opposite) screens:* allows 2-11 columns and 1-17 rows. Each row accepts one value (or missing value) only.

Skip patterns may be introduced for any screen(s)!

A Powerful Combination

After a questionnaire has been created, data is entered with PDE runtime. *PDE data can then be accessed by TabHouse® for cross tabulation without additional typing!* TabHouse® reads PDE questionnaires and fills in the variable names and locations and creates appropriate LableSets. Of course, TabHouse® can still process non-PDE data.

PDE runtime was designed to provide optimum performance and convenience when used with more than one computer over a network. Data is stored in a single file on the file server with a backup copy stored in the system folder of the start-up volume.

The PDE utility was designed to be used by almost anyone, from the newest telephone interviewer to the most experienced keypunch operator!

On Site Cross Tabs

TabHouse® runs extremely well on all Apple® PowerBooks™ making it a must for on site daily counts and cross tabulations! *Impress your clients with camera ready tables less than an hour after the data has been collected!*

Even IBM shops can, and should, take advantage of the power and ease of use with TabHouse® and an Apple® PowerBook™ .

Absolutely anyone can learn to use TabHouse® and the PDE utility in one hour or less!

TabHouse® Handles Very Large Jobs!

TabHouse® is cross tabulations software designed and written by a statistician for use on the Apple® Macintosh® computer.

A single project within TabHouse® can include 32,000 variables, limited only by available RAM memory. The number of records or cases is limited only by available disk space! TabHouse® allows display of weighted and unweighted data within the same table and can include up to 32,000 banner columns. Banner columns are flexibly defined by raw single variables, categorized single variables, and two or three level combinations of these. For example, tab all variables by gender within defined age categories within city. By running multiple projects users realize even greater flexibility!

Demonstration Diskettes

Pericles Software is happy to offer a TabHouse® 1.5 demonstration package, which includes a demonstration version of the PDE utility, for the modest price of $10.00. This fee will be applied toward a purchase of TabHouse®.

Pericles Software accepts MasterCard, Visa and American Express for your convenience. You may also send a company check or money order to the address below.

TabHouse® retails for $695.00 per single copy (5 or more copies are $625.00 each). All prices include the PDE utility. *There is a one time additional fee of $30.00 per node use of the PDE utility over a network.* TabHouse® Site Licenses are available. *Please call for more information.*

System Requirements

TabHouse®, PDE setup and PDE runtime all run on a 1 meg Mac Plus® or higher class Macintosh using system 6.0.5 or later operating systems. *Even on the lower end Macs®, data entry screens are displayed in three seconds or less.*

Networking the PDE utility requires AppleShare 2.0 or later, or System 7 file-sharing. While they have not been tested, Pericles does not expect problems using any other AFP-compliant server mechanism.

Network traffic is kept to a minimum, with file server access limited to the beginning and the end of an interview.

Pericles Software • 210 1/2 Louisiana Ave. • Perrysburg, OH 43551 • (419) 872-0966

users" and researchers with particularly long, repetitive, or complex questionnaires. Features include: list handling to permit "grids," "rosters," "macros," and questionnaire-writing efficiencies that save time and effort.

ADAPTIVE CONJOINT ANALYSIS (ACA) SYSTEM: is used to design products/services or answer strategic marketing questions. ACA lets you simulate the impact on product acceptance of changes in product design or pricing. This is done through the collection, via a computer-interactive interview, of individuals' preferences for product features. ACA includes all software needed to conduct a conjoint study.

CONJOINT VALUE ANALYSIS (CVA) SYSTEM: like ACA, is used to design products/services or answer strategic marketing questions. However, CVA lets you study price in greater detail. Rather than one price attribute, CVA allows prices to be associated with each product feature. And, unlike ACA, which requires a computerized interview, CVA can be used with either a computerized or paper-and-pencil interview.

ADAPTIVE PERCEPTUAL MAPPING (APM) SYSTEM: is used to understand how products/services compare to competitors on image-related issues. This information is useful in positioning products and identifying new product opportunities. APM produces "perceptual maps" of your product and its competitors; it also lets you simulate market response to changes in product image. Includes all software needed to conduct a perceptual mapping study.

Ci3 CATI SYSTEM: is a computer-aided interviewing system using PC's connected through a local area network. The system offers automatic call management, auto-dialing, quota control, disposition monitoring, interviewer productivity reporting, and more. Optional proactive dialing and Waksberg sampling modules increase dialing efficiency. Interviewing handled by widely-used Ci3 System for Computer Interviewing. Handles up to 60 interviewing stations.

CONVERGENT CLUSTER ANALYSIS (CCA) SYSTEM: is software for grouping survey respondents with similar characteristics into identifiable "clusters" for strategic target marketing. Market segments based on demographics, product preferences, or other variables can be identified easily and dependably using CCA. CCA can use data from any source, but it is particularly easy to use with data from Sawtooth Software products.

SPSS, INC.-SPSS/PC+: is an interactive, menu-driven data managment, analysis and presentation package. It features automatic error-checking, extensive on-line help, and the ability to read and write ASCII files. Statistical procedures include crosstabulation tables, descriptive statistics, exploratory data analysis, frequency counts, means and rank analyses. Data management facilities allow for selecting, sorting and weighting cases, merging multiple files, data aggregation and creating new varibles.

STATPAC, INC.-STATPAC GOLD IV is designed exclusively for survey analysis and marketing research. Features survey design, sample selection, data entry and management, CRT and telephone interviewing, basic analyses and presentation quality graphics. Includes frequencies, tabs and banners, open-ended response coding, multiple response, descriptives, breakdowns, correlations and t-tests. Advanced analyses available (regression, factor, cluster, conjoint, perceptual mapping, etc.) Complete tutorial.

ANALYSIS OF VARIANCE

BMDP Statistical Software, Inc.
Bruce Bell & Ascts.
BMDP Statistical Software, Inc.
Computers for Marketing Corp.
Concurrent Technologies Corp.
Crunch Software
FirstMark Technologies Ltd.
Lincoln Systems Corporation
Manugistics
Microtab, Inc.
NCSS
P-STAT, Inc.
Pizzano & Co.
Productivity Consulting Services
Raosoft, Inc.
SAS Institute
Scientific Computing Associates
Senecio Software, Inc.
Software For Research
Spring Systems
SPSS, Inc.
Statistical Innovations
StatPac, Inc.
Systat, Inc.
Tabulyzer
Vision Database

BRAND SHARE ANALYSIS

Bruce Bell & Ascts.
Datan, Inc.
Equifax Natl. Decision Systems
Geographic Data Tech.
Information Resources, Inc.
Landis Group
Management Science Ascts.
Marketing Software, Inc.
Market Probe International, Inc.
Pulse Analytics
Spring Systems
StatPac, Inc.
T/C/A
Terra Rsch. & Computing

CANONICAL ANALYSIS

BMDP Statistical Software, Inc.
Manugistics
NCSS
P-STAT, Inc.
SAS Institute, Inc.
Spring Systems
SPSS, Inc.
StatPac, Inc.
Systat, Inc.

CENSUS REPORTING PROGRAMS

Claritas/NPDC
Donnelley Demographics
Equifax Natl. Decision Systems

Geographic Data Tech.
GeoQuery Corp.
Sammamish Data Systems
SAS Institute, Inc.
SPSS, Inc.
Strategic Mapping

CLUSTER ANALYSIS

BMDP Statistical Software, Inc.
Bretton-Clark
Claritas/NPDC
Equifax Natl. Decision Systems
FirstMark Technologies Ltd.
Geographic Data Tech.
Landis Group
Manugistics, Inc.
MapInfo Corp.
NCSS
Pulse Analytics
P-STAT, Inc.
SAS Institute, Inc.
Sawtooth Software
Spring Systems
SPSS, Inc.
StatPac, Inc.
Systat, Inc.
Terra Rsch. & Computing

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Crunch Software Corp.
Cybernetic Solutions Co.
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Lincoln Systems Corporation
Manugistics, Inc.
Marketing Software, Inc.
NCSS
P-STAT, Inc.
Raosoft, Inc.
SAS Institute
Scientific Computing Associates
Senecio Software, Inc.
Spring Systems
SPSS, Inc.
StatPac, Inc
Systat, Inc.
Touch Base Computing
Vision Database

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Downie-Pine Company
Marketing Metrics
Market Probe International, Inc.
Raosoft, Inc.
StatPac, Inc.

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Information Resources, Inc.
MapInfo Corp.
Market Action Rsch. Software
Market Probe International, Inc.
NCSS

Pine Company
P-STAT, Inc.
Raosoft, Inc.
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Spring Systems
StatPac, Inc.
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Systat, Inc.
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Raosoft, Inc.
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Sawtooth Software
The Scientific Press
Senecio Software, Inc.
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William Steinberg Consulting, Inc.
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Sawtooth Software
SPSS, Inc.
StatPac, Inc.

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NCSS
SAS Institute, Inc.
Spring Systems
SPSS, Inc.
StatPac, Inc.

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Data Probe/Datatab
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Matrix, Inc.
Microtab, Inc.
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Pericles Software
Pine Company
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Quantime
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Sigma Research
Spring Systems
SPSS, Inc.
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StatPac, Inc.
Stolzberg Research
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Cybernetic Research Co.
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M/A/R/C, Inc.
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Microtab, Inc.
Pericles Software
P-STAT, Inc.
Quantime
Raosoft, Inc.
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Sigma Research
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StatPac, Inc.
Systat, Inc.
Tabulyzer
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Pericles Software
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Raosoft, Inc.
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Sawtooth Software
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Sigma Research
StatPac, Inc.
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Cybernetics Solutions Co.
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Datanetics
Lincoln Systems Corporation
Manugistics, Inc.
Marketing Probe International
Marketing Software, Inc.
Matrix, Inc.
Microtab, Inc.
Pericles Software
Pros & Cons, Inc.
P-STAT, Inc.
Quantime
Raosoft, Inc.
SAS Institute
Scientific Computing Associates
Senecio Software, Inc.
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Datanetics
Imagisys, Inc.
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Manugistics, Inc.
M/A/R/C, Inc.
Marketing Software, Inc.
Market Probe International
Matrix, Inc.
Microtab, Inc.
NCSS
Pericles Software
Principia Products
Pros & Cons, Inc.
P-STAT, Inc.
Quantime
Raosoft, Inc.
Research Data Analysis
SAS Institute
Sawtooth Software
Senecio Software, Inc.
Spring Systems
SPSS, Inc.
StatPac, Inc.
William Steinberg Consulting, Inc.
Systat, Inc.
Tabulyzer
Touch Base Computing
The Uncle Group
Viking Software
Vision Database

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CACI Mktg. Svces.
Claritas/NPDC
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Crunch Software Corp.
Cybernetics Solutions Co.
Donnelley Demographics
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Geographic Data Tech.
GeoQuery Corp.
Hawthorne Software
Information Resources, Inc.
MapInfo Corp.
Marketing Software, Inc.
Market Probe International, Inc.
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Microtab, Inc.
Pizzano & Co.
Productivity Consulting Services
P-STAT, Inc.

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SAS Institute, Inc.
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Slater Hall Information Products
SPSS, Inc.
StatPac, Inc.
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Manugistics, Inc.
NCSS
P-STAT, Inc.
SAS Institute
Sawtooth Software
Spring Systems
SPSS, Inc.
StatPac, Inc.
Systat, Inc.

DECISION SUPPORT SOFTWARE
Expert Choice

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SAS Institute, Inc.
Scientific Computing Associates
SPSS, Inc.
Systat, Inc.

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Matrix, Inc.
NCSS
P-STAT, Inc.
SAS Institute Inc.
SDR, Inc.
Spring Systems
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Systat, Inc.

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Manugistics, Inc.
P-STAT, Inc.
Systat, Inc.

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GeoQuery Corp.
Interra Tydac Technologies
MapInfo Corp.
Sammamish Data Sys.
Strategic Mapping
Tetrad Computer Applications Ltd.

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Equifax Natl. Decision Systems
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Pine Company
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Vision Database

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Jan Werner Data Processing

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Market Probe International, Inc.
Matrix, Inc.
Microtab, Inc.
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Spring Systems
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Systat, Inc.
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Tabulyzer
The Uncle Group

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Market Probe International
Matrix, Inc.
Microtab, Inc.
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StatPac, Inc.
Touch Base Computing

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SAS Institute, Inc.
Spring Systems
SPSS, Inc.
Systat, Inc.

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FirstMark Technologies Ltd.
Geographic Data Tech.
Landis Group
MapInfo, Inc.
M/A/R/C Inc.
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Marketing Software, Inc.
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Sawtooth Software
Spring Systems
SPSS, Inc.
Statistical Innovations
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Terra Rsch. & Computing
Touch Base Computing

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Geographic Data Tech.
Leadtrack
MapInfo, Inc.
Market Power, Inc.
StatPac, Inc.
Strategic Mapping

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SAS Institute Inc.
Spring Systems
SPSS, Inc.
Systat, Inc.
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Caliper Corporation
NCSS
SAS Institute
Systat, Inc.

MULTI-PAIRED COMPARISON
Pulse Analytics

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NCSS
P-STAT, Inc.
Pulse Analytics
SAS Institute
Smart Software
Spring Systems
SPSS, Inc.
StatPac, Inc.
Systat, Inc.
Vision Database

NAME GENERATION
Salinon Corporation

NON-PARAMETRIC STATISTICS
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Crunch Software Corp.
Datan, Inc.
Lincoln Systems Corporation
Manugistics, Inc.
NCSS
SAS Institute
Scientific Computing Associates
Software For Research
Spring Systems
SPSS, Inc.
StatPac, Inc.
Systat, Inc.
T/C/A

ON-LINE DATA TABULATION
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Cybernetic Solutions Corp.
Datan, Inc.
Datanetics
Data Probe/Datatab
M/A/R/C Inc.
Market Probe International, Inc.
Matrix, Inc.
Pericles Software
Pine Company
P-STAT, Inc.
Quantime
Raosoft, Inc.
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Spring Systems
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Stolzberg Research
The Uncle Group

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Datanetics
M/A/R/C Inc.
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Quantime
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Senecio Software, Inc.
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NCSS
P-STAT, Inc.
SAS Institute, Inc.

PERCEPTUAL MAPPING
Bretton-Clark
Landis Group
Market Action Rsch. Software
NCSS
SAS Institute
Sawtooth Software
Spring Systems
SPSS, Inc.
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Terra Rsch. & Computing

PRICE ELASTICITY MEASUREMENT
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Delphus, Inc.
Sawtooth Software
Spring Systems
Vision Database

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Advanced Data Research
Crunch Software Corp.

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The Idea Works, Inc.
Manugistics, Inc.
P-STAT, Inc.
Raosoft, Inc.
Research Data Analysis
SAS Institute
The Scientific Press
StatPac, Inc.

QUADRANT ANALYSIS
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Pulse Analytics
SAS Institute
Spring Systems
T/C/A

QUESTIONNAIRE DESIGN LANGUAGE
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Productivity Consulting Services
Quantime
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RANKING
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Brunetti & Associates
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Cybernetic Solutions Co.
Datan, Inc.
Data Probe/Datatab
Manugistics, Inc.
M/A/R/C Inc.
Market Probe International, Inc.
Microtab, Inc.
NCSS
P-STAT, Inc.
Quantime
Raosoft, Inc.
SAS Institute Inc.
Scientific Computing Associates
Senecio Software, Inc.
SPSS, Inc.
StatPac, Inc.
Systat, Inc.
Tabulyzer
T/C/A
Touch Base Computing

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Cybernetic Solutions Co.
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Market Science Associates
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Raosoft, Inc.
SAS Institute
Scientific Computing Associates
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Spring Systems
SPSS, Inc.
StatPac, Inc.
STSC
Systat, Inc.
TMS Systems
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Datanetics
Equifax Natl. Decision Systems
Ferox
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Geographic Data Tech.
GeoQuery Corp.
Hawthorne Software Co.
Leadtrack
Market Science Associates
MapInfo. Corp.
Marketing Information Sys.
Marketing Software, Inc.
Market Power, Inc.
Pizzano & Co.
Productivity Consulting Services
P-STAT, Inc.
Raosoft, Inc.
Sales Technologies
Scientific Computing Associates
Smart Software
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Touch Base Computing
Vision Database

SALES DATABASE
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Datanetics
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Information Resources, Inc.
Leadtrack
Marketing Information Sys.
Market Power, Inc.
Raosoft, Inc.
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Leadtrack
Lincoln Systems Corporation
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Systat, Inc.
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Spring Systems
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StatPac, Inc.
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Vision Base

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Microtab, Inc.
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Principia Products
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SPSS, Inc.
StatPac, Inc.
William Steinberg Consulting
Stolzberg Research
Systat, Inc.
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T/C/A
Touch Base Computing
The Uncle Group
Jan Werner Data Processing

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M/A/R/C Inc.
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Quantime
Raosoft, Inc.
Sawtooth Software
The Scientific Press
Senecio Software, Inc.
StatPac, Inc.

THURSTONE SCALING
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NCSS
SDR, Inc.
Systat, Inc.

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Creative Research Systems
Datan, Inc.
Delphus, Inc.
Lincoln Systems Corporation
Macro*World Research
Manugistics, Inc.
NCSS
Pizzano & Co.
P-STAT, Inc.
SAS Institute
Scientific Computing Associates
Smart Software
Spring Systems
SPSS, Inc.
Systat, Inc.
Vision Database

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Detail Technologies
Pizzano & Co.
Raosoft, Inc.

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Information Resources, Inc.
Raosoft, Inc.
Research Data Analysis

VERBATIM CODING
Apian Software
Bruce Bell & Ascts.
Business Rsch. & Surveys
Creative Research Systems
Cybernetic Solutions Co.
Datan, Inc.
Datanetics
M/A/R/C Inc.
Marketing Metrics, Inc.
Raosoft, Inc.
Research Data Analysis
StatPac, Inc.
Terra Rsch. & Computing

VOLUMETRIC ANALYSIS
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Management Science Ascts.
Microtab, Inc.
Ouantime
Statistical Innovations
T/C/A

SECTION IV SOFTWARE PROGRAMS FOR USE WITH MAINFRAMES

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QUANVERT: Interactive data analysis for researchers. Tabulates any question (variable) in the database by any other. Filter tables on any answer or combination of answers from existing questions. Weighted or unweighted output. Creates new variables by combining/splitting parts of existing questions. Handles multiple projects simultaneously. Interfaces with QUANTUM. Available on Multi-User 80386, IBM CMS/MVS, DEC VMS, UNIX machines.
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CORRECTIONS

Due to editing errors, the list of participants accompanying the article "How Qualitative Researchers See the Consumer of the 90s" in the December 1992 issue of QMRR contained several typos. Here is a corrected list:

Kathryn Alexander, Kathryn Alexander Enterprises, Inc.
Michael Anastas, Focus Probe, Inc.
Barbara Ankersmit, OmniTrak Group, Inc.
Myril Axelrod, Marketing Directions Associates, Inc.
Allan Benedict, Nordhaus Research, Inc.
Michael Bixler, MarketLink
Milton Brand, The Brand Consulting Group
Cindy Clark, C.D. Clark Ltd.
Mona Doyle, The Consumer Network, Inc.
Tory Fox, Charlton Research Co.
Warren Goldman, Warren Goldman Associates
Jane Goldwasser, New Directions Consulting, Inc.
Ellen Good, Focus First, Inc.
Joe Grieco, Grieco Research Group, Inc.
Barbara Hairston, Marketing Resources
Beth Hardwick, Hardwick Research, Inc.
Marilyn Landis Hauser, Hauser Ascts. Behavioral
  Science Cnsltnts.
Ellen Karp, Ellen Karp Research
Ann Klein, Klein Consultant Services
Michelle Kuhn, Viewfacts, Inc.
Judith Langer, Langer Associates, Inc.
Linda LaScola, LaScola Qualitative Research
Barry Liebling, Liebling Associates Corp.
Teresa Menendez, Menendez International
Irving Merson, Merson/Greener Associates, Inc.
David Rich, The Research & Planning Group
Alice Rodgers, Rodgers Marketing Research
Pamela Rogers, Pamela Rogers Research

Paul Rosenberg, Creative Business Solutions
Barbara Rosenthal, Qualitative Research Services
Mary Rubin, Maritz Marketing Research Inc.
Patricia Sabena, Sabena Qualitative Research Services
Susan Saurage-Thibodeaux, Saurage-Thibodeaux Research, Inc.
James Sears, James M. Sears Associates
George Silverman, Market Navigation
Grace Stanton, iNFOCUS Group Services South
Timm Sweeney, Sweeney International
Peter Swetish, M.O.R.-Pace, Inc.
Gina Thorne, Thorne Creative Research Services
Meredith Ware, Emmerson & Ware Limited
Bill Ziff-Levine, Radley Resources, Inc.
Martha Garma Zipper, Martha Garma Zipper
Louis Zivic, Fitchburg State College

CLASSIFIED ADS

Trade Talk

Since the book is so large and meant for a broad audience there are sections that some readers will skim through. Each chapter begins with a summary of its contents to make skimming easier. A few chapters feel padded but for the most part the authors know when to be concise and when to explain at length.

Consumer guide

Research firms may find it a handy resource to educate potential clients on the strengths and weaknesses of a particular approach. Research buyers will see its value as a "consumer guide" to research services that gives the reader several questions to ponder when choosing among research techniques and/or providers.

Also helpful to both in-house and outside researchers is the chapter on presenting research results. It gives valuable, common-sense suggestions on how to shape your presentation to meet the needs (and attention spans) of your audience: "Presenters will succeed if they have planned their research well and speak to the desires of their listeners. Presenters who forget that they are talking to Joe the package designer, to Mary who writes ad copy, and to the company president who is measured by the rise and fall of sales and profits have failed to do their job. A good presentation should be a mutual interplay of interest between the speaker and audience."

High-tech

The "state of the art" in the book's title is an acknowledgment that as computers and other technology have increased the capabilities of researchers so have they increased the expectations of the people who use the information researchers gather. Since all of that high-tech stuff is out there, the reasoning goes, researchers should be able to function with high-tech speed and precision.

The real world isn't always like that. So while Blankenship and Breen include passages on new techniques and technology and acknowledge their benefits, they show that old-fasioned careful planning and communication—between research vendor and client, between the in-house researcher and his or her "clients"—are two of the most important components of successful research. ❏

"State of the Art Marketing Research" by A.B. Blankenship and George E. Breen (hardcover, 580 pp., $44.95) is published by NTC Business Books, 4255 West Touhy Ave., Lincolnwood, IL 60646-1975. Phone 800-323-4900.

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By Joseph Rydholm
managing editor

Writing for the doers

Most of the research related books reviewed in our pages over the years have dealt with a specific aspect of marketing research—focus groups, psychographics, demographics—rather than the process as a whole. So I was happy when a copy of the new book "State of The Art Marketing Research" crossed my desk. I think it fills a void in research literature by providing a practical, up-to-date look at the research process.

Authors Al Blankenship and George Breen have drawn on their years of experience in marketing and research to cover the process from project design, testing, fielding, tabulation and analysis and presentation. The dust jacket notes indicate that Blankenship—professor emeritus, Bowling Green State University—worked for 26 years in practical research at ad agencies, client companies and research firms. Breen is a retired professor of marketing at Miami University. Among other positions, he served as director of marketing research at The Stanley Works in New Britain, Conn.

Their collective experience and their candid admissions of how they learned from mistakes lend the book an authentic, experienced-based feel.

The authors state that the book is aimed at the two "partners" in the research process—marketers and researchers—and also at top management. As this quote from the preface shows, the emphasis is on the practical: "We recreate as closely as possible real-life research situations. We take the student step by step through the key research concepts, but we omit much of the theoretical background...We stress applications and talk about specific sources of services, facilities, and specialized programs than can help researchers in on-the-job situations. Throughout, we are writing for the doers—those faced with marketing decisions."

All stages of research

With that in mind, they spend the book's nearly 600 pages covering all of the stages of the research process—in brief in early, overview chapters, and then in specific in later pages. Some of the topics covered include: how to decide if research is necessary and what approach to use; how to determine if an outside research firm would be helpful; how to choose between mail, phone, personal interviews, omnibus, etc.; how to develop a questionnaire; and a lengthy section on that most popular of research methods, the focus group.

Along with the emphasis on practicality, another idea running through the book is the value of information and cooperation. That is, making sure, when possible, that everyone who will use or benefit from a research project is involved and informed early on. This makes the research more effective because it answers the questions people want asked and it improves the likelihood that the validity of the research isn't questioned when the results arrive.

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Partial Schedule of Seminars Through August 1993

101. Practical Marketing Research
San Francisco .... Nov. 2-4
Chicago .... Nov. 23-25
Cincinnati .... Dec. 14-16
Chicago .... Jan. 18-20
New York .... Feb. 8-10
Cincinnati .... Mar. 1-3
Boston .... Apr. 12-14
Cincinnati .... May 3-5
New York .... May 24-26
Atlanta .... June 21-23
Boston .... July 12-14
Cincinnati .... Aug. 2-4

104. Questionnaire Construction Workshop
Los Angeles .... Nov. 9-11
New York .... Jan. 25-27
Cincinnati .... Mar. 8-10
Cincinnati .... May 10-12
Atlanta .... June 28-30
Cincinnati .... Aug. 9-11

105. Questionnaire Design: Applications and Enhancements
Los Angeles .... Nov. 12-13
New York .... Jan. 28-29
Cincinnati .... Mar. 11-12
Cincinnati .... May 13-14
Atlanta .... July 1-2
Cincinnati .... Aug. 12-13

201. Focus Groups: An Introduction
San Francisco .... Nov. 5-6
Boston .... Apr. 15-16

203. Focus Group Moderator Training
Cincinnati .... Nov. 17-20
Cincinnati .... Jan. 4-7
Cincinnati .... Feb. 2-5
Cincinnati .... Mar. 2-5
Cincinnati .... Mar. 30-Apr. 2
Cincinnati .... June 15-18
Cincinnati .... July 20-23

301. Writing and Presenting Actionable Marketing Research Reports
Cincinnati .... Dec. 7-9
New York .... Feb. 15-17
Cincinnati .... Mar. 22-24
New York .... June 7-9
Cincinnati .... Aug. 23-25

401. Managing Marketing Research
Cincinnati .... Dec. 10-11
New York .... Feb. 18-19
Cincinnati .... Mar. 25-26
Cincinnati .... Aug. 26-27

501. Applications of Marketing Research
Cincinnati .... Dec. 17-18
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Cincinnati .... May 6-7
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Cincinnati .... Jan. 14-15
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Cincinnati .... Nov. 19-20
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506. Customer Satisfaction Research
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Chicago .... Jan. 21-22
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601. How to Summarize, Interpret and Explain Marketing Research Data
Cincinnati .... Jan. 18-19
Cincinnati .... Apr. 5-6
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602. Tools and Techniques of Data Analysis
Cincinnati .... Nov. 30-Dec. 3
Cincinnati .... Feb. 9-12
Cincinnati .... Mar. 15-18
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Cincinnati .... Aug. 17-20

603. Practical Multivariate Analysis
Cincinnati .... Jan. 20-22
Cincinnati .... Apr. 7-9
Cincinnati .... June 2-4
New York .... July 28-30

701. International Marketing Research
New York .... Jan. 12-13

702. Business to Business Marketing Research
Cincinnati .... Nov. 4-6
Cincinnati .... Jan. 11-13
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Please call Lisa Raffignone at 800-543-8635 (ext. 6135) for schedule information for the following seminars which are also currently offered by the Institute:
- Introduction to Marketing Research
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