

How the performance score can simplify data

Michael Lieberman, Multivariate Solutions, shows how a straightforward statistical application can simplify a wide range of data

THE FIRST POINT I make with my terrified students in the initial lecture of a basic statistics course is that statistics, when you boil it down, is simply a numerical description of an event. The mud of correlations, regressions, ANOVAs, null hypotheses – the scary stuff – are no more than techniques to get an idea of what is happening.

Good research is the same. Good information, professionally gathered, well presented – a clear story with actionable, marketable results. Easily understood, by the supplier, the client, and their chiefs.

There are multitudes of ways to accomplish this. In this piece we are going to explore one increasing popular technique that can be instantly understood and used in executive decision-making. It boils down a sophisticated back-end to an index, a score, that measures performance. This technique has been applied to public relations, publishing, advertising, to retail outlet ranking, restaurant chains deciding the bonuses of brand and regional managers, even customer loyalty and professional sports.

Here is the score.

TABLE 1
Restaurant regression results

	Beta
Meal preparation	0.25
Meal quality	0.22
Host greeting	0.19
Wait time or seating	0.14
Menu variety and interest	0.13
Meal value	0.12
Rest rooms clean	0.12
Tables clean and organised	1.12
Appetiser quality	0.11
Check service	0.11

TABLE 2
Restaurant index results

Restuarant	Restaurant score	Grand mean	Index	Percentile
New Orleans	145.59	118.17	123	100
San Antonio	133.34	118.17	113	96
Atlanta	132.75	118.17	112	93
Key West	132.29	118.17	112	89
Miami	114.25	118.17	97	44
Denver	111.66	118.17	94	33
Memphis	102.01	118.17	86	11

Basics – the index

The score is created by a weighted measure of attributes as they are related to a key attribute, such as overall satisfaction with a store or intent to purchase an item. The weights are created by measuring association with the key attribute – the dependent variable. These measures are taken using regression analysis.

Let us use a restaurant chain as an example. This chain has regular visits by mystery shoppers who rate the restaurant on, say, ten attributes. At the completion of their visit they give the restaurant an overall score.

Regression does the following. It creates an equation to predict the dependent variable. The analysis produces beta scores. When put to use, each beta score is multiplied by the actual figure, then added up. So, in essence, these beta scores produce weights.

Below is the output from our restaurant chain's regression, using data from a year-long mystery shopper database that contains more than 20,000 records.

Examining Table 1, we see that meal preparation and quality are the most important factors that influence the overall rating. This should not be a surprise.

The index is calculated in two steps. The first is to run the equation, that is, multiply each beta by the rating, add them up, and you have the score.

The next step is to take the mean of the scores for each restaurant (or unit that you choose, for example, by market, state, or internal region). From there a few other measures are calculated. A mean of all the restaurants is then taken, called the grand mean.

If a given restaurant's score is divided by the grand mean, then multiplied by one hundred, the index is created. The index gives the client the ability to compare a given restaurant's score with all the other restaurants with one glance. For example, one look at Key West's Index (see Table 2) shows that it is doing better than average with an Index of 112.

If all the restaurants in the sample are sorted top to bottom, the top restaurant is given one hundred, the bottom is given a zero, and the others between are given a percentile. The percentile shows, at a glance, the relative position of a given restaurant. The percentile can be useful if the sample has tightly-bunched scores, producing indexes that are very similar.

Interpreting the percentile is straightforward. Miami has a percentile of 44, which means that 43% of the restaurants have not scored as well, but 56% are better. I would say the manager of the Miami branch is not pleased.

These measures are shown in Table 2 for a small sample of restaurants.

Application 1 – magazine covers

There is a snap, crackle, and pop ▶

TABLE 3
Cover eye tracking results

	Beta
Photo	0.49
Article content	0.37
Background cover colour	0.25
Tagline	0.22
Print size	0.14
Font	0.13

TABLE 4
Index – test covers

	Index
Lives of the rich and famous – Photo 2	113
Red shadows, green hearts – Photo 2	107
Lives of the rich and infamous – Photo 1	99
Back roads – Chile – Photo 2	99
Back roads – Chile – Photo 1	90
Red shadows, green hearts – Photo 1	87

TABLE 5

Georgia cosmetics	
	Percentile
Athens West	87
Savanah Towne Center	82
Macon	75
Atlanta Airport	52
Waycross Junction	37
Sandy Springs	26

TABLE 6

Regional pharamcy	
	Percentile
Upper Mid West	91
New England	76
Alaska and Hawaii	61
New York and New Jersey	52
Four Corners and Nevada	31
Detroit Metro	22

TABLE 7

Smith managers menswear	
	Percentile
Potter	55
Montgomery	51
Schwartz	44
Patton-Stein	40
Vase	20
Fleener	19

formula to selling magazines. This is often determined by focus groups, though quantitative methods are becoming increasingly relevant. In fact, we have found that applying the Performance Score method gives a quick and easy winner when an editor wants to know which of, say, four covers to go with. Or a cosmetics company is wondering which of five mock-ups to place in a campaign.

This particular application of the Performance Score can be carried out using a web survey which shows a cover, then asking the invited participant to rate each of the factors (see Table 3), then give an overall score. Or it can be shown using a mall intercept, where respondents from the target group (for example, twenty-something professional women) are shown the cover. An eye-tracking device measures their eye movements. The participant is asked to rate each cover on a scale, say 1-to-7.

The technique is most effective when the results are applied to a model created using historical data. That is, the publisher has a database that contains measurement from all of his publications over a period of time. The model is based on that, then applied as needed.

Table 3 shows the regression results of the historical model. Again, there is dual usage to this methodology. First, the model gives us descriptive results – we know that the photo and article content are the most persuasive. Next, the publisher now has the ability to score future covers.

Table 4 gives the answer. Application 2 – shining the spotlight on celebrity..

A major national retailer has a database of millions of customer surveys. These are

fairly extensive, ranging across different sections of the store. The retailer (we'll call it WorldMart) wants to be able to use their data.

Again, first step, the model. However, in this case we see that WorldMart has cases where a given customer has rated cosmetics, another the pharmacy, and others menswear. Within each category there is an overall score. Also, each respondent was asked to rate this visit, and his/her likelihood to return to the store.

The regressions were run, then fit. That is, what worked the best for the pharmacy section was not necessarily the same for menswear. Customers tend to visit the pharmacy section more than menswear. Cosmetics customers rarely buy menswear. So the dependent variables might vary. It is not necessary to show the regression results here.

WorldMart has asked us to modify the output, however. They are not interested in the actual store scores, or even the index. They would like more flexibility to assess units within their empire at different levels. They would like a number that is universal and can be calculated upon

request. What we provided for them, then, was the ability to create the percentile for each filter, for each department.

The equation is quite clear-cut:

$$\frac{[\text{Score}-\text{Minimum}]}{[\text{Maximum}-\text{Minimum}]} \text{ multiplied by one hundred.}$$

Below is an example where the maximum score was 132, the minimum 88, and the store we are looking at scored 112.

The equation is simple:

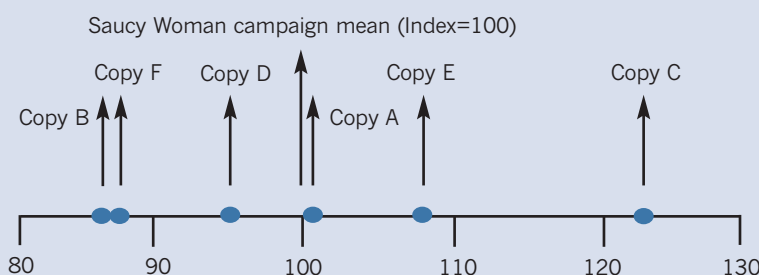
$$\frac{(112-88)}{(132-88)} * 100 = 54.55, \text{ or } 55.$$

The usefulness of this approach is that it allows WorldMart to shine a spotlight exactly where they would like. Table 5 shows the output of a request, say, from Anderson at the National Office.

Jones at National wants to see something different. Again, this comes from the same database. Table 6 shows what Jones is looking for. Smith at National requests to have a look at how his menswear regional managers are performing. Table 7 shows him. Overall, Smith is not doing too well. He is going to have to sit on some heads to get customer

FIGURE 1

Visual presentation of the Performance score





Michael Lieberman
is president of Multivariate
Solutions, a statistical and
marketing research
consulting firm.
michael@mvsolutions.com

service in this area up, or his head might roll. Smith's best, Potter, is only just above the middle. Managers Vase and Fleener had better improve their numbers, or update their resumes.

Performance score – graphical display

The Performance Score can be further simplified and made clear by creating a visual presentation. Though these can be limited by space, nonetheless they are effective when trying to present Performance Score results to senior management or a pitch to a potential client.

McMann-Bronfman advertising agency is presenting results from a minor field study to Saucy Lady Lipstick. After a two-day mall intercept in Las Vegas, McMann-Bronfman is presenting the results to the product managers from Saucy Lady, women who are comfortable with fashion, but not multivariate analysis (see Figure 1).

I think the saucy women will go with Copy C.

Conclusion

Clever research, effective but simplified presentation, and the use of this clever

technique yields reasonable, yet effective results. The ability of this technique is its ease of development, application, and the facile way by which it be graphically displayed make it an effective tool for decision making.

The successful employment of a sophisticated tool, such as this method of brand equity measurement, helps drive home the point more thoroughly and keep our clients one step ahead. ■



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