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## Enlisting Science's Lessons to Entice More Shoppers to Spend More

By KENNETH CHANG

QualPro Inc. of Knoxville, Tenn. . . . It employs statistical techniques used in testing nuclear weapons to test different ideas at once.

Take car dealers' ads with their catchy slogans and exclamation points like, "Clean sweep clearance this weekend only!"

Even that garish genre has variations. Is it helpful to know the number of cars on the dealer's lot? Should the ad emphasize the price or the monthly payments or the interest rate on a car loan? Is it enticing to know that the Bankston Nissan dealers in Texas are part of AutoNation Inc., which has been on the Fortune magazine list of America's Most Admired Companies for four years in a row?

AutoNation, a conglomeration of dealerships based in Fort Lauderdale, Fla., was indeed interested. It enlisted QualPro last year to test what combination of factors made for more effective newspaper ads. The process began with a brainstorming session to generate ideas that were whittled to 30, with the criteria that they were easy to use and did not add significant cost.

Some factors tested seemed obvious. Surely, a full-page ad attracts more attention than a half-page ad, and a splash of color should also be catchier.

Some seemed trivial. Would a larger map showing the dealer's location help?

Typically, most scientific experiments try to test one variable while keeping all other factors constant. For example, in test of new drugs, participants are carefully chosen so that two groups have the same mix of age, sex and health with one group, and the only difference is that one group receives the drug and the other receives a placebo.

But to test 30 variables one at a time would take a long time and would be prohibitively expensive. One-at-a-time experimentation would also miss instances involving multiple factors – synergy, in other words, the 1990's buzzword. The QualPro method, multivariable testing or M.V.T., originated in World War II, when the British were seeking ways how to shoot down German bombers more effectively. Given the urgency of the task, two British statisticians developed a way to test different tactics quickly.

Charles Holland, founder of QualPro, came across a paper by the statisticians describing the method and its success in the 1960's, when he was an employee of Union Carbide heading a statistics group at the Oak Ridge National Laboratory.

Dr. Holland's first high-profile use of multivariable testing was in 1969. Oak Ridge was in charge of manufacturing high-strength low-weight carbon foam parts for nuclear weapons. The manufacturing of the parts was failing spectacularly. Some 85 percent were defective and thrown away. The lab was considering starting anew at a cost of several million dollars.

Dr. Holland persuaded lab managers to let him try to find a less draconian remedy. He had one eight-hour shift. The statisticians gathered the workers who made the parts and asked them about changes that should be tried, like "drop the mold on the ground to drive out large air bubbles."

One worker said his mother did that after pouring batter into a cake mold.

That one shift found enough factors to increase the success rate from 15 percent to 60 percent. Subsequent fine-tun-

ing raised the percentage to 85 percent, and then 99.

For AutoNation, the stakes are lower, but not trivial. It spends millions of dollars a year on advertising. Traditionally, dealers created their own advertising and, through experience, came up with what they thought worked best. But different dealers often had different ideas, and AutoNation wanted a better idea of what worked.

"Can you learn the wrong things from history?" said Art Hammer, the QualPro consultant working with AutoNation. "Yes."

For four weeks last spring, AutoNation's advertising agency generated ads for 40 dealers following recipes testing 29 factors. For each factor, QualPro compared the dealers that had incorporated the changes with those that had not.

Typically, one-quarter of the factors help, one-quarter hurt and half have no effect at all, Mr. Hammer said.

Some surprises popped out. A full-page ad was no more effective than a half-page one. The addition of color – a considerable expense – did not generate any extra sales.

"Ad size didn't have an effect," Gary Marcotte, senior vice president of marketing at AutoNation, said. "Color didn't have an effect. When you put them together, they did have an effect."

Now, the company is moving much of its advertising to half-page color advertisements.

"When done effectively, it's just as effective as a full page ad," said Mr. Marcotte, who added that he had not expected that result. "It's shown us that science can be more effective than gut."