Paul E. Green: An Applications' Guru

by

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The Massachusetts Department of Transportation just announced that they are changing all of the signs on their automated-toll system. Henceforth, "Fast Lane" will be branded "EZ-Pass." I don't know whether to interpret this development as Massachusetts finally catching up with other states or the triumph of Paul's applications' insight. In the late 1990's the concept of automated tolls, based on the military's "friend or foe" technology, was new. Travelers, long accustomed to waiting in long toll lines and fishing through their cars for quarters, could look forward to simply driving through toll gates (or later, at speed through open-road tolling systems). But, like all new technologies, automated tolling would not have gotten off the ground if the initial systems were not consumer friendly. In fact, "The project also had a fair amount of drama – the study team's overseeing committee did not always see eye-to-eye with one another or, for that matter, with the study team, as well (Green, Krieger and Wind 2004, 193)."

But EZ-Pass was designed and EZ-Pass is a success. I wasn't there at its birth, but I can image the debates about what facilities needed to be open, how would the user apply, how many lanes would be available for EZ-Pass, would EZ-Pass be transferable, how much would it cost, and could it be used in other places (ibid, 194). These are not easy questions and if they had not been answered correctly, it would have been hard to launch EZ-Pass successfully. But Paul had the patience and the skills to convince the founders that they needed market research, to carry out that market research, and to make sure that the market research affected the EZ-Pass launch. These are rare skills.

I have written elsewhere in this Legends' series about Paul's contributions to theory, to statistics, and to the development of new analytic and measurement tools. These are substantial and important contributions; the field of marketing science owes a great depth to Paul. But this

Legends' volume is about applications and Paul is an applications genius – an applications guru.

First, applications are hard. Managers do not always appreciate the need for quantitative information, and if they do, they often try to influence the outcome. We all have "war stories" about managers choosing features for conjoint analysis or attributes for perceptual maps so that they, the managers, look good. I recall a situation in which a brand manager for a spaghetti product selected the attributes. They were all some combination of "is Italian" or "made by Italian moms." His brand did very well on those dimensions and he would have been a hero – at least until a market test. It took all of the analysts' persuasion abilities to convince him to gather unbiased voice-of-the-customer information and do the market research correctly. The reward was as successful new campaign.

Second, applications require intelligent tradeoffs. There is nothing mathematical that will prevent applications with hundreds of features. But try to get a consumer to evaluate enough 100-feature full-profile evaluations to get reasonable estimates, particularly in a age when respondents multi-task and are extremely busy. Paul's research has addressed these challenges head-on with hybrid methods, hierarchical Bayesian estimation, creative data-collection formats, and other methods that make the most of limited data. For example, consider the famous paper on the design of *Courtyard by Marriott* (Wind, et al. 1989). That application had some 50 features with a total of 160 feature levels. Paul was able to get good data with pictures and three-dimensional models combined with observable rooms in which furnishings and décor were varied. Without such attention to detail and without such sensitivity to the ability of consumers to visualize and react to new hotel concepts, the project could not have succeeded. As detailed in this volume, Marriott implemented all of the study's recommendations and succeeded in the marketplace.

Third, applications often challenge the science or, as Paul himself has said, the engineering. It has been almost forty years since the Paul's seminal article on conjoint analysis (Green and Rao 1971). One application in that paper had three features for a total of ten feature-levels. A homemaker ranked all 36 possible profiles and the authors used Monanova to estimate the part-worths. Today's applications are based on numbers of feature levels that often an order of magnitude larger than in that application. Data is collected quickly with web-based questionnaires and analyzed using methods that that "borrow" information from all consumers to inform estimates for each consumer. Sample sizes can be in the thousands. While ranking survives as a data-

collection format, most formats now seek to place consumers in more-realistic choice situations and consumers no longer have to evaluate all possible combinations. (In fact, questions are sometimes chosen adaptively.) It is becoming common to provide aligned incentives to encourage respondents to think hard and answer accurately. And, as we push to the future, new applications recognize that consumers often use heuristic decision rules to first consider and then choose products. Paul's has used applications to motivate many of these new methods. But, in a true tribute to Paul, the field has grown to such an extent that innovations are now coming from many researchers around the world.

Paul's applications have led to global adoption. I was recently asked to write a commentary on a paper to be published in the *International Journal of Research in Marketing*. That paper applies new methods from machine learning to the design of milk products in Greece. The paper focuses on product optimization (a topic Paul pioneered) and uses data from a large conjoint study (another topic Paul pioneered). But Greek applications are far from the only international applications drawing on methods Paul pioneered. I'm aware of applications in China, Japan, Germany and many other places and in a wide variety of product categories from beer to automobiles. I've spoken to the practitioners. They all cite Paul's influence.

I've known Paul for almost forty years and I am grateful. I always think of Paul as a researcher whose excitement is infectious. He is truly passionate about new applications whether they be for product design, product optimization, market segmentation, product positioning, pricing analysis, bundling and assortment, branding, decision support systems, advertising, or "but for" courtroom analyses. Paul describes himself as an engineer and he is a darn good one. But he is also a scientist and a humanitarian. His applications have begotten science and his science has begotten applications. We owe him a great depth.

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