Has this ever happened to you? Your client, who is a major manufacturer of high-speed color printing equipment, has hired you to perform a conjoint analysis, and in the process of designing the study, has told you that he is “100 percent positive” that his customers, who are all printing industry professionals, will understand the attribute, “standard deviation of the printer alignment error.” You take the attribute to a typical printing customer, who is a grizzled old industry veteran in his sixties. He looks at you as though he’s wondering if you’ve recently been committed to an asylum, and asks, “What are you talking about?”
Conjoint analysis has become one of the most frequently used quantitative marketing research technique in the world. But sadly, this means that it is far too often misused. This article is an attempt to point out the many pitfalls in conjoint analysis and how to avoid falling into them.

WHERE DID CONJOINT COME FROM?
The seminal article on conjoint analysis was published by Green and Rao in the Journal of Marketing Research in 1971, and it has been extensively used and improved in the decades since its debut. Its name comes from “considered jointly,” because it almost always involves a comparison of one product (or service) with another. By forcing respondents to make tradeoffs when ranking or choosing between products, it is possible to reveal which product attributes drive consumer preferences and market share. These revealed preferences are generally regarded as superior in terms of accuracy and discrimination to self-reported importance ratings.

Conjoint analysis comes in a number of flavors, some of which have different names. The most popular methodology today involves making choices across a number of alternatives. It is often called choice modeling, choice-based conjoint or discrete choice modeling. Since this methodology still forces customers to make tradeoffs, it can still be fairly referred to as conjoint analysis.

Conjoint is useful for designing or refining new or existing products, for market segmentation (i.e., grouping people by how much they value different product attributes), for estimating price sensitivity/elasticity and for evaluating the amount customers would be willing to pay for certain levels of individual attributes. Indeed, choice-based conjoint is recognized as the “gold standard” for dealing with price issues.

As might be expected of a technique that has been around for so long, the design of conjoint surveys and the analysis of conjoint results are easily done using an off-the-shelf, menu-driven software package. One of the most popular of these is the one from Sawtooth Software.

However, just as with other popular modeling techniques, such as ordinary least squares regression, the sheer ease of use of the conjoint analysis software lends it to misuse. A model is only as good as its assumptions, and once these are violated (which is not always obvious to the user), the results of the model can be seriously compromised (in ways that are not obvious, either). So, before you begin using conjoint analysis for your product, it is a good idea to think a bit about whether this technique is right for you.

SOME BASIC TERMINOLOGY
Conjoint analysis treats a product as a combination of attributes. For example, a pickup truck can be characterized in terms of attributes such as cab size, bed size, towing capacity, acceleration, fuel economy, etc. Each attribute can have a number of possible levels, between which it is sometimes possible to interpolate in the analysis, if the levels represent values on a continuous scale. Using our pickup truck example once more and miles per gallon (mpg), fuel economy may have levels such as 10 mpg, 15 mpg, 20 mpg, etc.

In a conjoint survey, respondents are presented with a series of tasks, where they are shown two or more product profiles at a time. These profiles, generated according to an experimental design, represent hypothetical products, described in terms of the attributes and levels. Respondents choose between the profiles (a “choice model”) and rate or rank them in some way. These days, choosing between profiles is most popular, because choosing more closely mimics the decisions customers make in the marketplace than ranking or allocating points across profiles.

UNDERLYING ASSUMPTIONS
Conjoint analysis assumes that a customer’s overall value, or utility, for a product is a weighted sum of the utility of each of its parts (as in “the whole is the sum of its parts”). The weights that are derived in the analysis, which place more importance on some attributes and levels than others, are called part worths, which give a relative utility value for the different levels of each attribute.

To calculate the utility of a product, real or hypothetical, the model simply adds up the part worths of the levels present in the product. To decide what market share each of a set of competitive products may achieve, we make use of one of a number of possible decision rules (e.g., the First Choice rule) in which each respondent will purchase the product that has, for them, the highest utility.

QUESTIONS YOU SHOULD ASK
Knowing just these few things, we can assess the suitability of conjoint analysis for almost any situation. In the paragraphs that follow are some common questions that you should ask to determine whether conjoint analysis is right for your particular situation.

1. Is a utility-based market share the right model?
Conjoint analysis assumes that the only things that drive purchases are the relative preference and price for each product in the category. If sales for your product are significantly affected by other important drivers, such as promotions, sales force effort, word of mouth and advertising, you will have to factor these in separately, most likely using judgment. This problem is often manifested in conjoint simulations, when a user carefully puts in the current products in a category, only to find that the resulting shares do not match that well with reality. This could be for some of the following reasons:

- Do you want to estimate the percent of the population that will eventually buy a product? Then conjoint analysis is probably not for you. A market share model, like conjoint, assumes that everyone is going to make a purchase. While it is possible to put a “none” option into a choice model,
experiments have shown that this seriously overestimates the number of people who would buy, because respondents want to be cooperative and choose one of the available options if at all possible.

- Does your boss want to know how sales of a new product will grow, from launch to six months to one year and beyond? If so, and you’re using conjoint analysis, you’re in trouble. Because the model has no time element, it is not possible to model the diffusion of category purchasing throughout the population, as you would with the Bass or Fourt-Woodlock model. In conjoint analyses, people are either in the category, or they are not.

- The model also assumes that everyone stays loyal over time to the first chosen product. Additionally, it assumes that people make purchases at the same frequency, with the same number of items per purchase, unless you weight respondents to take care of this. Remember that conjoint analysis is asking about behavior for a single, generalized purchase occasion. If the product in question is a medical device that would be purchased for many rooms in a hospital or across multiple hospitals, then this sort of purchase quantity information can be very important. Even for consumer packaged goods, such as fruit snacks, the number of children in the family or the presence of heavy users can lead to different purchase quantities for different households.

- Some products have different preferences or rates of use by purchase occasion. For example, you may prefer a larger, more powerful computer for office use and a lighter, smaller computer for travel and home use. If you or your business can afford both, how would you answer the questions in a conjoint questionnaire? The eventual driver of the car will have various preferences, but those can be affected or rejected by the person in the family who is actually “doing the deal.” If one decision maker cares only about product specifications and the other only about price, then interviewing either about both specifications and price can be a problem.

3. Can the product be adequately described and realistically valued using a set of discrete features? Or is a holistic view more appropriate? To what degree are product choices determined by more subjective considerations, such as aesthetics?

Some products, particularly those we use to express our tastes or identity, mean more to us than the sum of their physical features. It is how they make us feel that counts, and the exact thing that makes us feel the way we do may be difficult to pin down. Conjoint analysis assumes that people rationally evaluate the attributes of different products and then choose the one that offers the most value. But what about consumers who choose Ford Mustang because they think it looks good while driving it? Or a young cook who chooses a particular brand of pasta because it’s the brand always used by his or her mother? People who ignore the rational product attributes we’ve so carefully laid out in our study in favor of aesthetic, holistic or even missing attributes can be a real problem.

4. Are all of the important attributes included, and are the various levels realistic? If so, are there too many of them for people to evaluate?

A smartphone may have hundreds of features, and a helicopter or automobile may have thousands. Unfortunately, the largest number of attributes a conjoint survey respondent can deal with is about 10. So, before executing the study, it is critical to
assess whether the number of product attributes can be kept to a manageable size and whether the ones that remain include all of the important attributes that drive people’s purchase choices. Leaving out an important attribute can render the research’s results invalid and/or misleading.

For instance, a colleague of mine was once doing a conjoint analysis for a client in the health insurance industry. They wanted to see how customers trade off all of the various financial criteria in a given health plan: the office visit co-pay, the prescription co-pay, the individual deductible, the family deductible and the maximum lifetime benefit. While my colleague was not exactly a health insurance expert, this seemed much too narrow to him. What about the need for a referral to see a specialist? What about the inclusion of various types of alternative medicine such as chiropractic, podiatry and osteopathy? And what about the ability to go outside of the network in the event of a life-threatening illness? Sure enough, when these attributes were included, they proved to be far more important than, say, a slightly lower co-pay. If the critical attributes can be fully identified through qualitative research prior to a conjoint analysis, it will ensure much more realistic results.

Similarly, it is highly beneficial to make sure that you only include realistic levels of the various attributes. For instance, we once did a conjoint on the design of a new medical diagnostic device, in which one of the attributes was the number of tests that could be simultaneously run (it ran them in batches). Our client was originally interested in testing a range of levels from six to 80. But by doing some initial qualitative research, we were able to determine that no customer would be interested in any number below 12 and that anything above about 48 was viewed as unnecessary. By including only realistic levels of an attribute, we can further simplify the exercise and leave room to test other attributes and/or other levels.

5. Can people intelligently evaluate the attributes? Can the attributes be expressed in terms that are understandable and relevant to customers?

Sometimes, our clients are engineers who want to know very specific things relevant to the physical design specifications of their products, and these can be much more technical than the attributes used by the customers themselves. Remember our printer example from the start of the article? Even though most customers have been in the business for many years, most have no idea what a standard deviation is, and they may use very different words to describe what the engineers refer to as printer alignment error. For this reason, it is almost always advisable to conduct up-front qualitative research with customers to make sure that the attributes mirror their actual decision criteria, are reasonably complete with respect to the most important attributes and are expressed in terms that they can understand.

6. Are there enough customers out there to complete our survey? And if so, can we afford to recruit them?

If you only have 10 customers, asking them each to complete a lengthy quantitative survey is probably the wrong approach—it’s best to just talk to them. Conjoint analysis, like most quantitative techniques, requires sufficient sample size in order to make statistically valid conclusions. You should make sure (particularly with B2B applications) that there are enough people to interview (you’ll typically need at least 200 to 300 completed surveys) and that they are not too expensive to recruit. While it is possible to get individual-level results from a conjoint analysis, it is best to look at groups of 30 respondents or more when assessing results so that random errors do not give you misleading results.

Clearly, this is a rather long list of questions, and some may find them daunting. However, the good news is that most of the issues above can be dealt with through careful design and by speaking with customers up front before fielding the survey. There are some requirements—such as the need for a forecast of product volume over time instead of market share, a product where the whole is more than the sum of its parts or where there are multiple decision makers—that will most likely require the use of a different type of research and analysis. Finding this before your company spends a lot of money on the wrong type of study is undoubtedly a good thing. Not doing this could be a career-limiting move. ☑

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