## FIRST, IN A THREE PART SERIES

This is the first in a series of three (3) articles that we will explore the different trade-off techniques frequently used for different marketing decisions. First, we will explore Discrete Choice Modeling, then Full Profile Conjoint Analysis, and lastly Paired Trade-Off Analysis.

COMPLEX DECISION MAKING PROCESS

Discrete Choice Modeling is a trade-off and simulation technique useful for studying these types of questions:

> Product design and pricing issues such as what features maximize share, revenue or profit or whether buyers value features enough to pay their incremental cost

> The effect of line extensions (e.g., self-cannibalization) Whether and how to bundle product or service offerings Market sizing and potential growth

> The effects of situations or occasions on purchase decisions

> Combinations of all these issues, as needed.
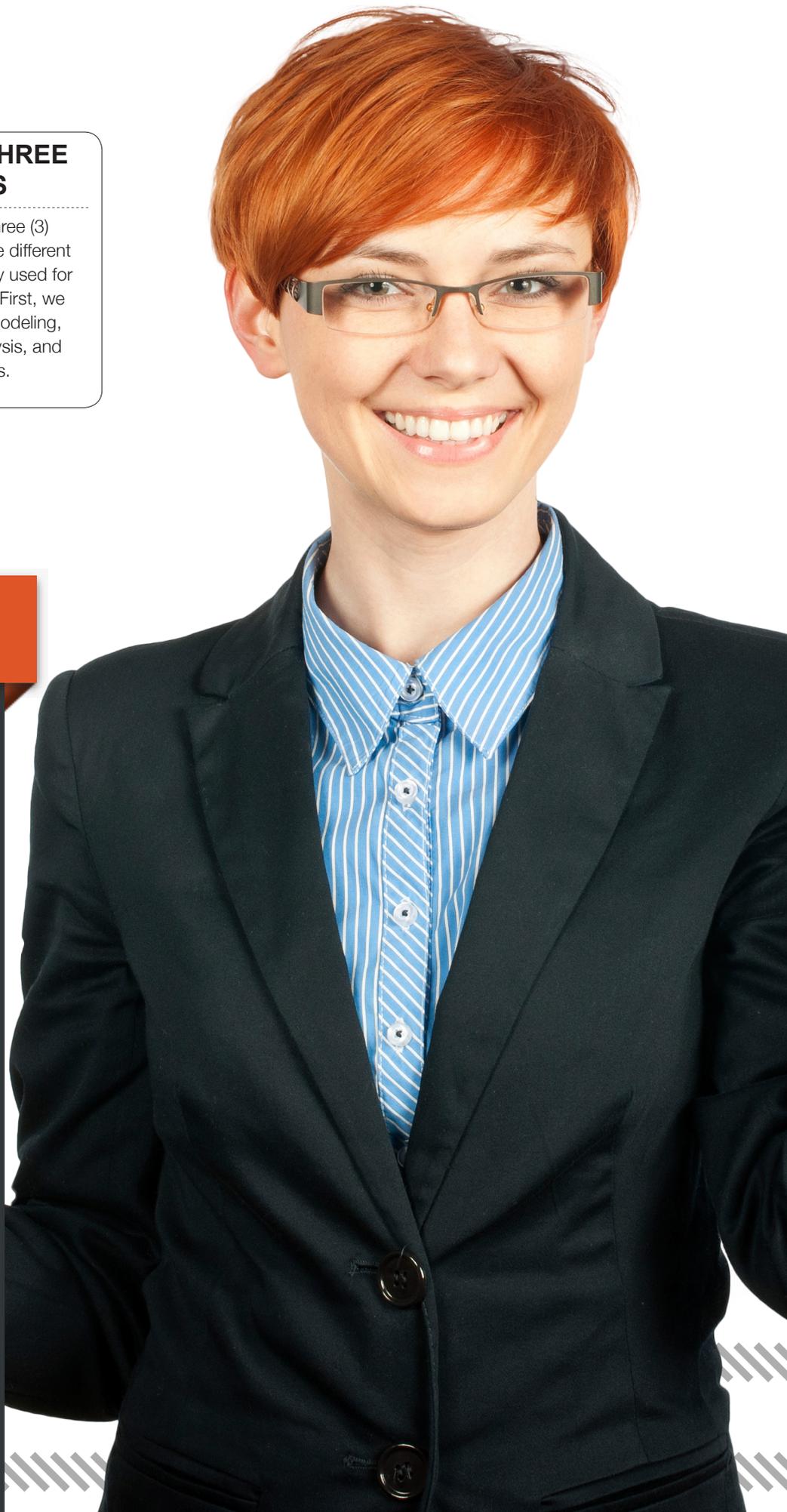
Many marketing decisions require complex decision making processes which incorporate many data points from various sources. Depending on the type of decision you need to make, some statistical techniques will be more useful than others.

Did you know?
Discrete Choice Modeling offers substantially more flexibility than Conjoint.

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DISCRETE CHOICE MODELING

> DCM can accurately reflect very complex markets without technical constraints that may require Conjoint to oversimplify real-world issues.

> DCM presents survey respondents with a realistic and natural purchase decision task.
> *These tasks not only make data collection easier and provide more reliable data, they also make intuitive sense to non-technical end-users of the research results.*

> DCM extends the general capabilities of Conjoint to many types of problems such as market sizing or situational effects that Conjoint cannot handle.

CONJOINT OR DISCRETE CHOICE?

Some of these issues can also be addressed by Full Profile Conjoint Analysis.

However, Discrete Choice Modeling offers substantially more flexibility than Conjoint.

CASE STUDY:
GAMING CONSOLES

Consider the following example. A manufacturer of high-tech recreational products (e.g., gaming consoles) wants to expand its product line to new audiences who are not as technically sophisticated or as experienced as its current loyal customer base.

AUDIENCE EXPANSION

They have conducted enough preliminary research to identify a selection of product features which are feasible to develop within current research and development budgets.

However, they want to know what combinations of features at various price points will be most attractive to consumers.

They also want to know whether they should develop one entry-level product or a small portfolio of entry-level products. Lastly, if multiple lower-priced products are developed, to what extent will these new products cannibalize existing share of their current mid-range product line?

These questions are best answered in the context of a **Discrete Choice Modeling** design.

Design of Discrete Choice Modeling Choice Task Sets

One of the first steps in the design of a Discrete Choice task set is to determine the number of attributes and levels to be studied.

Attributes are the statistical equivalent of product features and levels are the variations within a particular product feature. For example, in our game console question, attributes may include the number or style of controllers which can be attached to the unit, the extent an individual can play games with an online community of gaming "friends," and the availability of a package of parental controls for the unit.

ATTRIBUTE SELECTION

Levels may be two, three or four controllers of varying types, ranges on the number of online "friends" allowed in a gaming session, and parental controls on content ratings, "friend" identification, and automatic shut-down after screen-time limits have been reached. The attributes of price and brand name are also commonly included.

DESIGING ATTRIBUTES AND LEVELS

One of the most important decisions to make in the design phase is to find a balance between the number of attributes and levels needed to answer the objectives of the research and the number that a respondent in the targeted market can be expected to react to in a meaningful way without becoming overwhelmed by the task.

These criteria vary depending on the product and market being studied. In studies involving many attributes and levels within attributes, the number of choice tasks to complete the design may be much more than a single respondent will be able to handle without abandoning the survey. In these situations, one sampling strategy to be considered is a fractionalized design.

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Once these decisions are made, the graphics of the choice task set are programmed into the survey. The attributes are arranged in rows and competing product choices are arranged in columns with the levels for each attribute populating the cells in each column/row intersection. Graphics are included as appropriate to provide more information to the respondent.

FRACTIONALIZED DESIGN

In fractionalized design, the number of choice task sets in the overall design remains the same and is structured to fully answer the research objectives of the study. However, the number of choice task sets any individual sees is a statistically derived subset of the total number of choice task sets.

This strategy does involve larger sample sizes to make sure that each choice task set is seen by a statistically appropriate number of respondents.

However, it also helps to ensure that the DCM design and data generated from it completely explore the attributes and levels necessary without compromising data collection efforts through respondent fatigue or unrealistic market simulations of buying decisions.

fractionalized
design

"In fractionalized design, the number of choice task sets in the overall design remains the same".

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> The goal is to present the respondent with a realistic comparison of available or potential products in the category being explored.

RESPONDENT COMPARISON

Respondents are then asked which of the available options, as they are currently configured, they most prefer and how likely they are to purchase the option they selected. If none of the current configurations are appealing, the respondent may select none of the above. A simplified sample choice task is shown in Figure 1.

Figure 1:

Example of Discrete Choice Task	Client Brand "A"	Client Brand "B"	Competing Brand "A"	Client Brand "C"
Number of controllers	4	3	2	3
Number of online friends in gaming session	4	3	3	2
Parental controls available	Content rating Timed shut down "Friend" ID	Content rating "Friend" ID	Content rating	Content rating Timed shut down
Price	$400	$300	$200	$350

Thinking only of these four products, which of these products do you most prefer?

Client Brand "A"	Client Brand "B"	Competing Brand "A"	Client Brand "C"	None
➕	➕	➕	➕	➕

How likely would you be to purchase the product you selected from among these four products?

Not at all Likely   Extremely Likely

○ ○ ● ● ● ● ➕ ➕ ➕ ➕

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Each respondent is shown a series of these tasks, the number of which is determined by the numbers of attributes, levels, and products included in the design.

It is in the design of the choice tasks that the main differences between Discrete Choice Modeling and Full Profile Conjoint become apparent. DCM allows for the presentation of many choices simultaneously rather than one-by-one in sequence as in Conjoint Analysis. This gives respondents a much more realistic shopping experience in the survey process. It also avoids the problem of having to test "every attribute/level with every other attribute/level" which is regarded by many researchers as the best known limitation of Conjoint Analysis. Each product configuration represents a realistic product that could be on the shelves. It avoids the situation of ascribing to competitive brands the benefits associated only with your product. Conversely, it avoids the situation of claiming benefits provided by competing brands than your innovation can't realistically honor simply to fulfill the requirements of the Conjoint Analysis design specifications. Simply put, Discrete Choice Modeling allows you to study very complex markets and problems without having to oversimplify real issues to fit the artificial design requirements of Conjoint Analysis.

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What Does Discrete Choice Provide as Results?

Discrete Choice Modeling yields valuable information about potential share of preference, estimates of purchase intent, estimates of revenue, and can yield important information about competitive products, depending on the design of the choice tasks. Share of preference refers to the percentage of respondents who chose a particular product configuration over others in the design. For example, you would be able to identify what proportion of the potential market is likely to prefer a game console with four ports for controllers, access to four online game "friends" per session, and a full parental control package at $400 over all other product configurations. This is helpful to develop estimates of demand in the marketplace.

Estimates of purchase intent refine these findings further by identifying how likely potential customers are to actually purchase the product (or products) they like the best. Just because a product is most highly preferred among alternatives does not necessarily mean customers will purchase it. Looking at interactions between shares of preference and purchase intent helps to provide more guidance into potentially profitable research and development decisions.

By looking at variations in price, share of preference, purchase intent ratings, and additional information from clients and other sources, Discrete Choice Modeling studies often yield estimates of market revenue. We all know that no study can take into account all factors not included in the research design, such as advertising, product availability, changes in competitive products or competitive landscape, manufacturing costs, or other strategic initiatives. While these revenue estimates shouldn't be expected to allow for all conditions in the marketplace, they can provide accurate estimates based on the quality of the design of the choice tasks themselves and the quality of information made available from clients.

In situations where competitive products are included in the design, performance potential against competitive products can also be estimated, particularly in regard to cannibalization of one product over another. For example, let's assume that one of the competitive products being evaluated is actually a higher-end product currently being made by your company. By comparing respondent choices when this higher-end product is included in the mix of products in the choice tasks versus when it's not, we can estimate to what degree the new product may or may not cannibalize existing market share from existing products.

The presence or absence of specific attributes at specific levels can also be used to estimate both direct effects and indirect effects on share of preference for a specific product. Direct effects show the effect the presence or absence of an attribute has on the product itself. For example, holding all other product features constant and lowering the price of a specific product is widely assumed to make the product more attractive in the marketplace. This test of perception of value can be quantified by looking at the direct effect of price on share of preference for a specific product. In some cases, we have found that lowering a price too much serves to reduce preference for the product, a finding of great importance in pricing strategy discussions. Similarly, offering a low-cost but highly attractive feature at the same price may have enough of a positive effect on preference for the product that the additional manufacturing cost is more than offset by the potential increase in revenue.

Indirect effects show the effect the presence or absence of an attribute has on other products being examined. That is, indirect effects help to answer the question of what happens to Product B if Product A is altered in a specific way. These indirect effects are also very helpful in answering questions about cannibalization.

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About Customer Lifecycle, LLC
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Customer Lifecycle is a global research-based consultancy committed to helping our clients avoid costly mistakes by focusing on thorough front-end planning, appropriate support for research execution, and in-depth deployment consulting and implementation at the back end. Outcomes are rigorous and balanced customer-focused performance metrics, improved financial results, and a superior total customer experience. Its mission is to provide companies with insight into their industries and staff by deploying sophisticated analyses to answer tough business questions, and intelligence that clients can act on with confidence, thereby offering an edge in understanding customer choice, engagement, loyalty and advocacy.

Each stage in the customer lifecycle—acquisition, service, growth, retention—has its own unique challenges and solutions to address specific business issues. Customer Lifecycle helps both B2B and B2C focused organizations plan and conduct research to accurately identify and measure customer requirements for satisfaction, loyalty, and retention at every stage of the relationship and to deploy and integrate customer requirements for performance into the processes and internal performance metrics of the organization.

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➕ Simulators

More often than not, one of the deliverables of a Discrete Choice Modeling study is an interactive simulator. A snapshot of a simplified simulator is shown here.
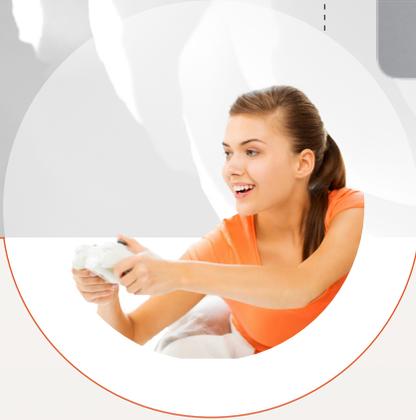
Product	Product A	Product B	Product C	% Choosing	
				Competitive Product	None of the above
Percentage Choosing Product as Configured	14%	3%	14%	34%	7%
Included in Product Portfolio	Included	Included	Included		
Brand	Brand A	Brand B	Brand C		
Number of controllers	Three	Four	Two		
Number of online "friends" per gaming session	Four	Three	Two		
Parental controls package	Three	Two	One		
Price	$300	$400	$200		

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The simulator shows the same information as was presented to respondents in the choice tasks with the interactive ability to change the levels within the attributes (see the down arrow next to the level of "Three" in the attribute row for "Number of controllers"). Changing the levels automatically updates the results which populate the three graphs at the bottom of the page. These graphs display estimates of share of preference, purchase intent, and estimated revenue for the data set being explored. The blue buttons to the right activate the instructions and documentation features of the simulator as well as the ability to print the page. Simulators can be customized in a variety of ways depending on your needs, of course; this example is intended as a mock up only. Our simulators are designed using Microsoft Excel and can be run in either PC or Mac environments. They are very easy to use and require virtually no training or set-up time for you.

Real-World Applications

The tangible results from a Discrete Choice Modeling study also come in a spreadsheet format to accompany the simulator. The spreadsheet starts with calculated metrics for a "base case" set of assumptions. The base case is usually a depiction of the current market, or of the "most likely" configuration for the new products. However, it can be any set of assumptions that form a convenient reference point. The remainder of the spreadsheet shows how many share points, units of revenue, or other measures of interest to your business are gained or lost by each product, relative to the base case, when changes are made to each product's attribute levels. Our programming automatically changes every attribute to every one of its possible levels, one at a time, and summarizes this information in an easy-to-use Excel spreadsheet. In this way, we can clearly show which attributes make the most difference in performance on the metrics of greatest interest to your clients and which levels are best in each one, without your having to manipulate the simulator to identify all scenarios in the analysis design.

In Conclusion…

In short, Discrete Choice Modeling retains much of the look and feel of traditional Conjoint Analysis studies, while removing many of its constraints and disadvantages. Furthermore, it adds to the range of types of problems that can be studied and provides elegant and easy-to-use deliverables which help to enable you to make profitable business decisions.

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