directiveanalytics
Guiding Strategic Marketing Decisions

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***Conjoint Analysis** enables researchers and marketers to identify the optimal product and/or service offerings consumers most desire in terms of product and/or service features, pricing, and other trade-offs.*

Example Applications

- **Brand equity:** understand the impact of brand on the purchase decision
- **Strategic pricing:** approximate changes in market demand for a given product as price changes (price elasticity of demand)
- **Advertising:** identify which messages are most favored by key audiences
- **Product development:** to prioritize benefits/features based on importance to purchase
- **Product testing:** to assess a variety of prototype designs to determine which has the greatest potential for success
- **Pricing research:** to determine the optimal price to charge consumers for a product or service
- **Needs-based studies:** to identify which attributes are critical versus those consumers are willing to sacrifice

conjointANALYSIS

Conjoint Analysis

Conjoint analysis is a statistical methodology used to understand how consumers make complex purchase decision, and how they trade off features and benefits when making those decisions. The goal of conjoint analysis is to understand preference/importance of a set of product features and to use this information to determine what attribute or combination of attributes is/are most influential to the purchase decision. Ultimately this is used to predict consumer behavior.

Using traditional attribute rating batteries often yields skewed distributions with little differentiation between attributes; everything is considered important. Often consumers have trouble directly identifying real or hidden drivers that influence their purchase decisions, and asking consumers to evaluate individual attributes in isolation differs from actual purchase behavior, where consumers are likely choosing based on the combination of attributes found in an actual product.

Conjoint takes this into account and makes product/service testing more realistic. In a conjoint exercise, consumers are presented with a series of product profiles and asked to make a purchase decision similar to one they would make in the real world. Full product descriptions, price, and competitive offerings may be included. A "none" option is often used to allow the respondent to make the very real decision not to purchase any of the products presented if they do not meet their purchase criteria.

By varying included features, attributes, and price while forcing trade-offs, market researchers can assess which features and attributes are highly valued by consumers versus those they are willing to sacrifice. This also allows the researcher to examine and understand the interaction between attributes to understand any symbiosis or preference which may occur when a particular pair or set of attributes is combined. Through statistical modeling, all of this information can be used to help understand why specific attributes are selected over others during the preference tasks, and can be used to derive an optimal product or service offering.

Methodological Considerations

Designing a conjoint study can be complex. If too many features and attributes are included, consumers may mentally simplify the choice process to get through the exercise (e.g., focusing on only one attribute such as size or price). For this reason alone, control over the number of attributes/levels included in the model is critical. Prohibited pairings (exclusion of unlikely or unreasonable combinations of attributes) can also compromise the efficiency of a model, and must be considered carefully during design. Ultimately the features, attributes, and combinations tested should accurately depict what a consumer is likely to find in the marketplace.

Different conjoint methodologies are better suited for different tasks (see Analytical Approach matrix for more detail). Careful design is the key to success, and the specific conjoint approach should adequately reflect how buyers make decisions in the marketplace. An exercise that reflects how products are described, displayed, and considered within a competitive environment will provide the most representative results.

Analytical Approach

The implementation of conjoint analysis begins by determining which method is most appropriate to address the research objectives of the study. While there are several methodologies available, these are the most commonly used:

	Choice Based Conjoint (CBC)	Adaptive Conjoint (ACA)	Full Profile Conjoint (CVA)
Design Overview	Respondents are shown a full set of distinct product profiles and asked to choose the one that they most prefer. *Note: This choice-based task is viewed as much easier and more realistic than the ranking/rating tasks used in other conjoint models.*	Respondents are shown a set of questions which are used to understand the features that fall into the consideration set. The Adaptive Conjoint algorithm then develops full product profiles in real-time based on each respondent's attribute preferences.	Respondents are shown a distinct product profile (one at a time or in pairs) and asked to rank/rate their preference for each.
Applications & Key Benefits	Best used with a limited number of attributes and few prohibited combinations. **Key Benefits** ■ Presents "realistic" tasks (buyers choose between rather than rate options) ■ Handles price well ■ Allows inclusion of "none" option	Best used where there are too many attributes to use CBC or full profile **Key Benefits** ■ May include more attributes than other forms of conjoint ■ The design reduces the # of attributes shown and can be more streamlined than full profile designs	Best for situations where a computer assisted design is not applicable or in cases where a hard copy stimulus must be used. **Key Benefits** ■ Full profile design utilizes all feature sets and may be administered to smaller samples
# of Attributes	Generally 6-8 plus price	Up to 30	Maximum of 6
Administration	■ Computer (recommended) ■ Paper	■ Computer only	■ Computer (recommended) ■ Paper
Limitations	■ Requires a larger sample size ■ Assumes respondent has some category knowledge and can make meaningful trade-offs ■ May become tiresome to respondents if too many profiles are presented	■ Not as effective in pricing studies (impact of price tends to be under-estimated by model) ■ Assumes respondent has some category knowledge and can make meaningful trade-offs ■ Must be administered via computer since the model adapts to consumers' responses	■ Not appropriate for studies with a large number of attributes (>6) ■ Limited ability to measure interactions ■ Assumes respondent has some category knowledge and can make meaningful trade-offs ■ May become tiresome to respondents if too many profiles are presented

Additional techniques are available for specialized situations. Latent Class Analysis may be applied to studies with heterogeneous choice data to model subtle interactions. Hierarchical Bayes Estimations (HB) may be used to address heterogeneity among individuals, to estimate non-linear functions, or to measure cross-effects. Partial Profile CBC may be used in instances where the researcher needs to test many attributes (more than 10) and the sample size is large enough to stabilize results.

marketSIMULATOR

Once data is collected from a conjoint study, data can be integrated into a market simulator. The simulator is used to better understand combinations of features, and the relationship between those combinations and purchase decisions. Ultimately the simulator is used to derive an optimal product/service offering.

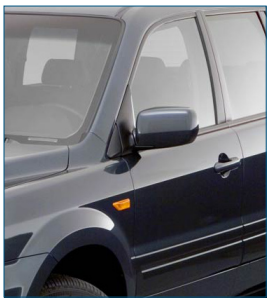
The market simulator can be used to:

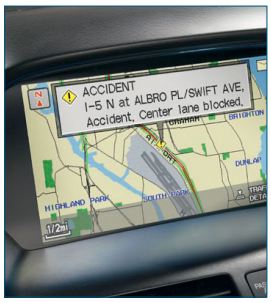
- Identify opportunities to increase market share through the introduction of a new product line.
- Understand if a new product introduction may cannibalize existing product lines.
- Derive an optimal product configuration while meeting cost constraints by including client production and development in the modeling.
- Create a price sensitivity curve for a product to identify optimal price point.

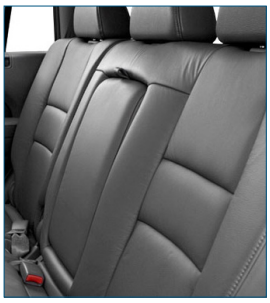
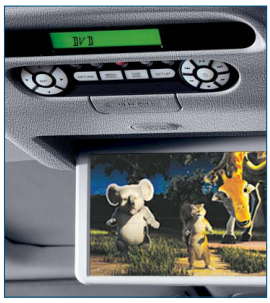
Illustrative Example

In the example below, U.S. consumers were shown a full set of potential Sport Utility Vehicle (SUV) configurations, including price, and asked to choose among the options presented. Choice Based Conjoint analysis was used to identify an optimal product configuration, determine which factors were most influential in purchase intent, examine price sensitivity, and recommend a pricing strategy for the optimal product configuration.

Conjoint analysis can derive optimal product/service offerings cost effectively by identifying the marketing variables which drive consumers' purchase decisions.





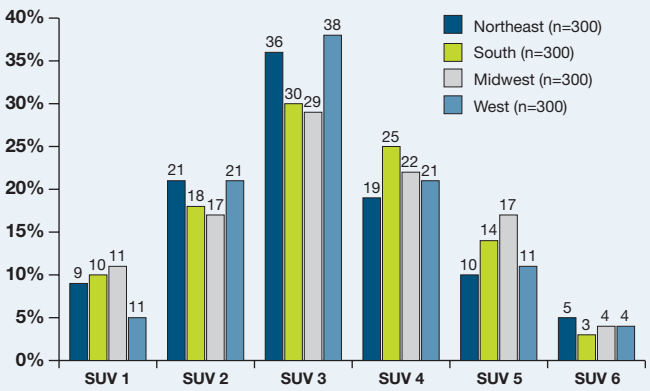
Five Optimal Product Configurations

Among all product configurations tested, five were identified as optimal based on their share of preference versus one another and by themselves versus a 'none' option.

Product Tested	Price	Entertainment System	Navigation System	Interior Features	4WD/ 2WD	Model	Engine
SUV 1	$21,000	CD	No navigation system	Leather	4WD	Standard	V6
SUV 2	$25,000	CD/DVD	Navigation system	Cloth	4WD	Standard	Diesel
SUV 3	$30,000	CD/DVD	Navigation system	Leather	4WD	Standard	V8
SUV 4	$25,000	Radio	No navigation system	Cloth	2WD	Standard	V6
SUV 5	$20,000	Radio	No navigation system	Cloth	4WD	Standard	V6

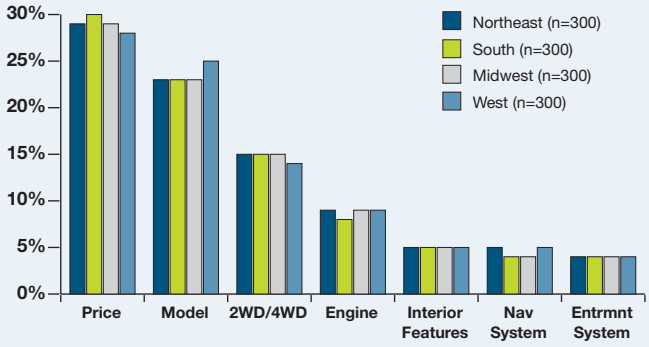
Share of Preference for Five Optimal Product Configurations

When looking at the five optimal product configurations against one another, SUV 3 performed best based on the percentage of consumers who selected this option over the others presented.



Overall Importance Contribution of Each Factor

Across all regions, price and model were the most important factors consumers considered in their selection of an optimal SUV.



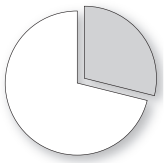
A price of $30,000 had the strongest impact on SUV purchase intent. Priced lower, consumers may have negative perceptions regarding quality; priced higher, consumers lose interest in the product.

Overall Impact of Price on SUV Purchase Intent

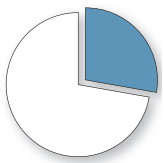
A price of $30,000 had the strongest impact on SUV purchase intent.
Priced lower, consumers may have negative perceptions regarding quality; priced higher, consumers lose interest in the product.

29% Overall Importance Contribution of Price, Northeast

30% Overall Importance Contribution of Price, South

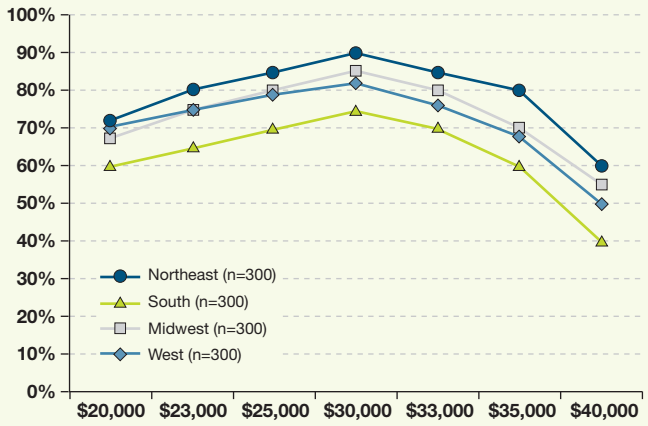


29% Overall Importance Contribution of Price, Midwest



28% Overall Importance Contribution of Price, West

Share of Preference for Optimal Product Configuration (SUV 3) at Various Price Points



Consistent with the price impact results, the price sensitivity analysis indicates share of preference for SUV 3 is strongest at $30,000. Purchase intent declines above this price, most significantly between $35,000 and $40,000. However, potential market share at price points between $30,000 and $35,000 should be aligned with manufacturing margins to derive an optimal price based on overall profit potential.

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Orme, Bryan (2007), "Which Conjoint Method Should I Use," Sawtooth Software Research Paper Series.

Orme, Bryan (1996), "Helping managers understand the value of conjoint," Quirks Marketing Research Review (March) Article ID 19960305.

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