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Validation of Adaptive Conjoint Analysis (ACA) Versus Standard Concept Testing

James J. Tumbusch,
MarketVision Research, Inc.
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James J. Tumbusch

MarketVision Research, Inc.

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Published evidence of the validity of conjoint analysis techniques has been sparse, rarely based on data collected for any real marketing purpose, and consisting mainly of unrealistically small simulation experiments (three to six attributes). This paper describes a successful validation of Sawtooth Software's Adaptive Conjoint Analysis (ACA) via independent concept testing. Across four different frequently purchased product categories, strong correlations were obtained between the consumer appeal derived from conjoint studies using ACA and the corresponding appeal obtained from standard concept tests known to be predictive of product success/failure in the real marketplace.

INTRODUCTION

Conjoint analysis is based on a model of consumer choice behavior which underlies nearly all of our more conventional market research techniques (for example, blind and identified product tests, attitude studies, concept testing). The model states that a brand, product, or service can be considered as a "bundle" of attributes or attribute levels, each of which makes some contribution to overall customer/consumer acceptability. Individual customers/consumers may want different mixes of these attribute levels. Each customer/consumer will be more likely to buy an existing product/service, or try a new product/service, if it comes closer to his/her desired "mix" than other available alternatives.

With more conventional product or concept testing, we usually vary one or two elements of the attribute mix at a time to determine the effect of the change(s) on customer/consumer acceptance (or preference). With conjoint analysis, we can estimate the contributions to overall choice behavior of many different attribute-level changes, all in the same study.

With Sawtooth Software's Adaptive Conjoint Analysis (ACA) approach, data are collected via a microcomputer interactive questioning technique, with questions based on the individual respondent's earlier answers and his/her value system relative to the product/service category being investigated. By asking respondent preference between a relatively small number of pairs of hypothetical products (attribute-level bundles), we can estimate the respondent's individual likelihood of choosing any hypothetical product/service over any other such product/service, or group of products/services (encompassed by the conjoint study).

Conjoint analysis can be employed from a point early in the product development process (early concept stage), to just before test marketing. It can be used to: 1) allocate product development resources toward attributes where changes would substantially increase customer/consumer acceptability, 2) precede conventional concept testing where it is appropriate/necessary to evaluate a large number of attribute-level combinations, and/or 3) determine an optimal positioning for a product/service relative to competition.

VALIDATION OF CONJOINT ANALYSIS RESULTS

Prior to the comparatively recent availability of practical methods for conducting conjoint studies, market researchers depended almost entirely upon standard concept testing to finalize concept design. Beginning in 1985, with the successful implementation of computer-interactive interviewing using ACA, large-scale conjoint studies became feasible and economical. But, to date, published information on the validation and/or calibration of conjoint results has been sparse.

Conjoint analysis is, in our judgment, most effectively positioned as a replacement for conventional concept testing, especially when it is desirable to study consumer reactions to many different variations in product attributes all in the same study. It seems entirely reasonable to expect conjoint results to be somewhat predictive of concept test results.

METHODOLOGY

During 1985, conjoint studies were conducted for each of four different frequently purchased product categories. For each study, respondents were screened and recruited by phone; over 300 ACA/Ci2 (Ci2 System for Computer Interviewing) interviews were conducted at central location facilities in several different cities:

Conjoint Study	Number of Attributes	Base Size	Number of Cities
Product Category A	7	706	3
Product Category B	11	342	3
Product Category C	11	319	3
Product Category D	6	365	4

From the results of each of the four conjoint studies, a broad range of concepts (from “most appealing” to “least appealing”) were chosen to be evaluated via concept testing. From the specific set of attribute-levels that made up each concept, concept statements were written. For each concept chosen from each of the conjoint studies, questionnaires were mailed to an independent sample of households large enough to ensure 300 returns for each concept. Each respondent was asked to read the appropriate concept statement and indicate his/her propensity to purchase the product described:

- Definitely will buy
- Probably will buy
- May or may not buy
- Probably will not buy
- Definitely will not buy

Data analysis consisted of correlating the total utility across respondents (indexed to 100) derived from the conjoint study versus percent of respondents who answered “Definitely will buy” derived from the concept test.

The following table shows conjoint study appeal (utility index) versus concept test appeal (% Definitely will buy).

	Concept	Conjoint Study Utility Index *	Concept Test % Definitely Will Buy	Correlation
Product Category A:				
	1	100	51	
	2	72	47	
	3	68	45	+0.72
	4	48	54	
	5	10	28	
	6	0	39	
Product Category B:				
	1	100	19	
	2	99	18	
	3	98	28	
	4	83	18	
	5	82	17	+0.77
	6	82	21	
	7	74	18	
	8	35	16	
	9	0	9	
Product Category C:				
	1	100	21	
	2	88	19	
	3	77	21	
	4	76	25	
	5	65	22	+0.81
	6	60	23	
	7	51	10	
	8	10	12	
	9	0	3	
Product Category D:				
	1	100	57	
	2	89	39	
	3	80	36	
	4	76	40	
	5	75	42	
	6	73	35	+0.75
	7	58	35	
	8	42	40	
	9	39	36	
	10	34	24	
	11	0	26	

* Utility Index - Relative appeal of one concept versus the others, typically 100 for the most appealing concept, 0 for the least appealing concept, encompassed by the conjoint study.

The relationship between concept test appeal and conjoint study appeal is also shown graphically in Figures 1 through 4.

Figure 1. Product Category A

Concept Test vs Conjoint Appeal

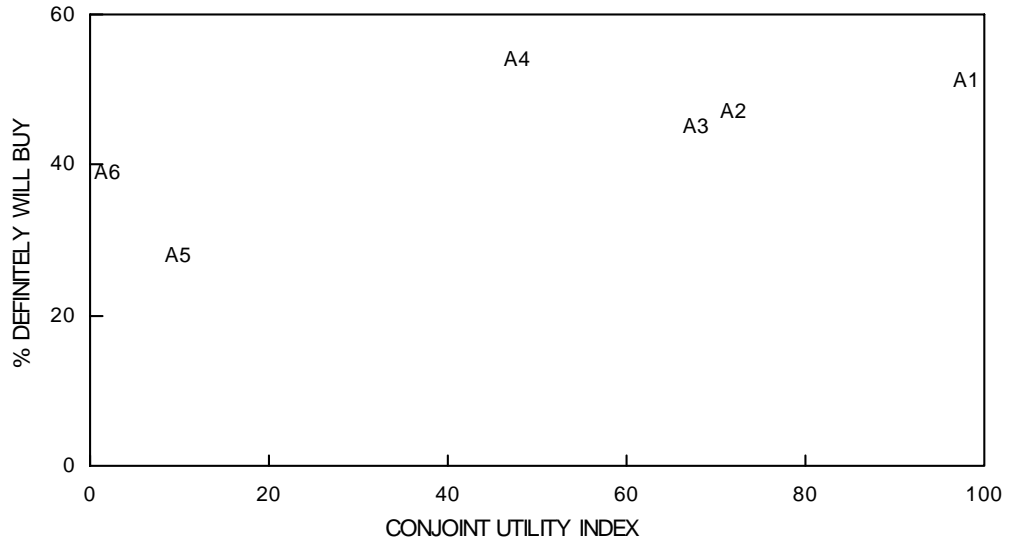


Figure 2. Product Category B

Concept Test vs Conjoint Appeal

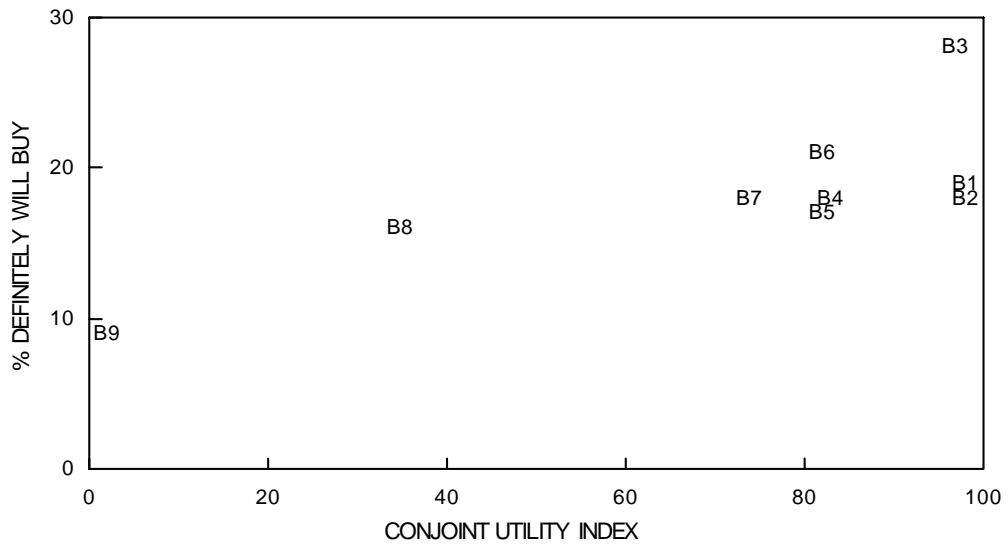


Figure 3. Product Category C
 Concept Test vs Conjoint Appeal

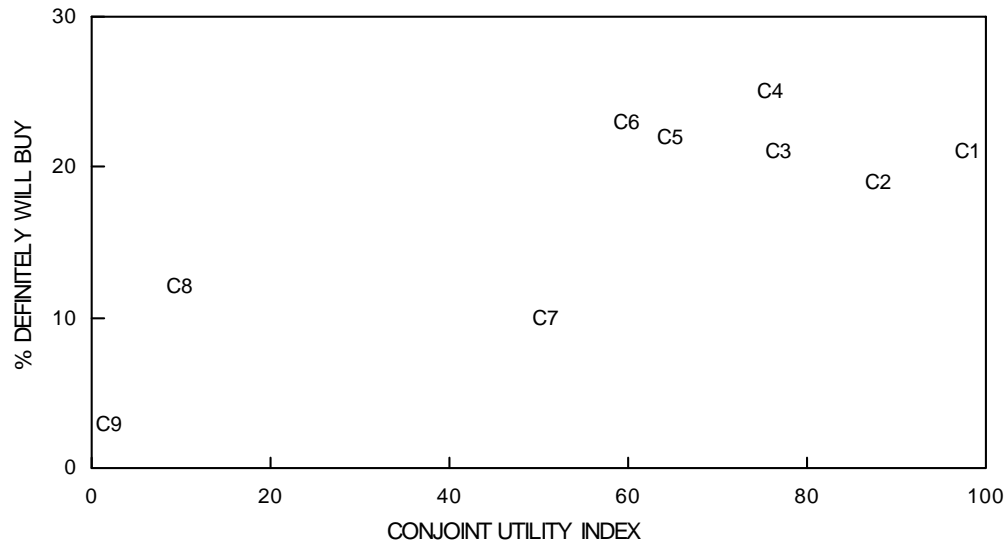
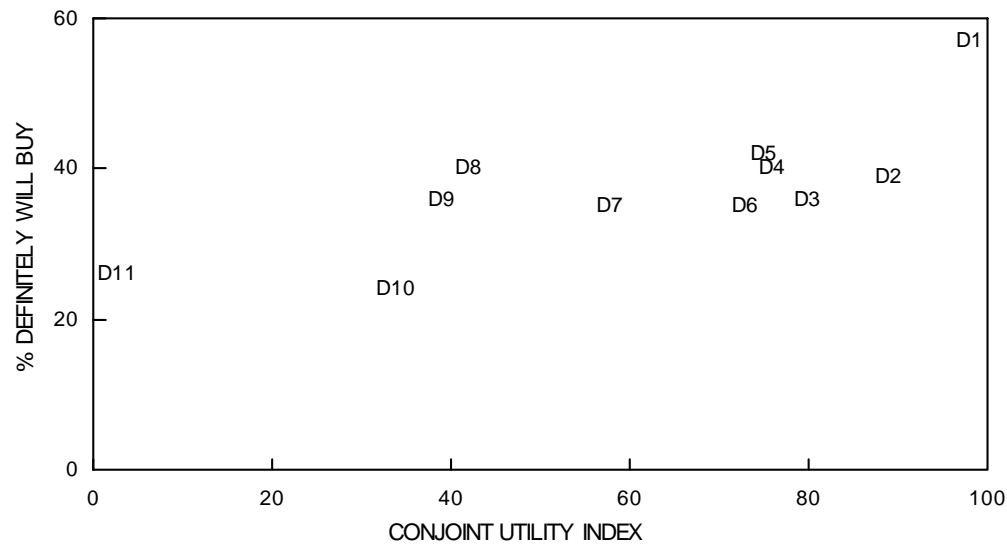


Figure 4. Product Category D
 Concept Test vs Conjoint Appeal



DISCUSSION

Since the concept testing was done from six to twelve months after the completion of the conjoint studies, with completely independent samples of respondents, this attempted validation constitutes the most severe test of ACA results of which we are aware. Sampling alone can account for a variation of plus/minus 5 percent in “% Definitely will buy.” In addition, consumer value systems relative to the individual product categories involved could have undergone certain changes over the elapsed time between the conjoint studies and concept testing.

These results represent strong evidence across four different product categories that:

- 1) the rank order of appeal of concepts derived from conjoint analysis corresponds reasonably well to the rank order of appeal obtained from conventional concept testing, and,
- 2) there is a strong correlation between concept appeal derived from conjoint analysis and appeal resulting from concept testing, which itself has been shown to be predictive of product success/failure in the marketplace.

There is also evidence that conjoint analysis may be more sensitive than conventional concept testing. Conjoint analysis forces the respondent to make choices between pairs of attribute-level bundles whereas we have seen that if we expose consumers (via concept test) to a variety of concepts encompassed by the conjoint study, there may be no appreciable variation in appeal. For example, for the Product Category C study, the conjoint study utility index for the top six concepts ranges from 60 to 100, while concept appeal only varies from 19% to 25% “Definitely will buy.”