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Understanding Conjoint Analysis in 15 Minutes

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Understanding Conjoint Analysis in 15 Minutes

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Conjoint analysis is a popular marketing research technique that marketers use to determine what features a new product should have and how it should be priced. Conjoint analysis became popular because it was a far less expensive and more flexible way to address these issues than concept testing.

The basics of conjoint analysis are not hard to understand. I'll attempt to acquaint you with these basics in the next 15 minutes so that you can appreciate what conjoint analysis has to offer. A simple example is all that's required.

Suppose we want to market a new golf ball. We know from experience and from talking with golfers that there are three important product features:

- Average Driving Distance
- Average Ball Life
- Price

We further know that there is a range of feasible alternatives for each of these features, for instance:

Average Driving Distance	*Average Ball Life*	*Price*
275 yards	54 holes	$1.25
250 yards	36 holes	$1.50
225 yards	18 holes	$1.75

Obviously, the market's "ideal" ball would be:

Average Driving Distance	*Average Ball Life*	*Price*
275 yards	54 holes	$1.25

and the "ideal" ball from a cost of manufacturing perspective would be:

Average Driving Distance	*Average Ball Life*	*Price*
225 yards	18 holes	$1.75

assuming that it costs less to produce a ball that travels a shorter distance and has a shorter life.

Here's the basic marketing issue: We'd lose our shirts selling the first ball and the market wouldn't buy the second. The most viable product is somewhere in between, but where? Conjoint analysis lets us find out where.

A traditional research project might start by considering the rankings for distance and ball life in Figure 1.

Figure 1

Rank	*Average Driving Distance*	*Rank*	*Average Ball Life*
1	275 yards	1	54 holes
2	250 yards	2	36 holes
3	225 yards	3	18 holes

This type of information doesn't tell us anything that we didn't already know about which ball to produce.

Now consider the same two features taken conjointly. Figures 2a and 2b show the rankings of the 9 possible products for two buyers assuming price is the same for all combinations.

Figure 2a

Buyer 1

		Average Ball Life		
		54 holes	**36 holes**	**18 holes**
Average Driving Distance	**275 yards**	1	2	4
	250 yards	3	5	6
	225 yards	7	8	9

Figure 2b

Buyer 2

		Average Ball Life		
		54 holes	**36 holes**	**18 holes**
Average Driving Distance	**275 yards**	1	3	6
	250 yards	2	5	8
	225 yards	4	7	9

Both buyers agree on the most and least preferred ball. But as we can see from their other

choices, Buyer 1 tends to trade-off ball life for distance, whereas Buyer 2 makes the opposite trade-off.

The knowledge we gain in going from Figure 1 to Figures 2a and 2b is the essence of conjoint analysis. If you understand this, you understand the power behind this technique.

Next, let's figure out a set of values for driving distance and a second set for ball life for Buyer 1 so that when we add these values together for each ball they reproduce Buyer 1's rank orders. Figure 3 shows one possible scheme.

Figure 3

Buyer 1		***Average Ball Life***		
		54 holes **50**	**36 holes** **25**	**18 holes** **0**
Average Driving Distance	**275 yards** **100**	(1) 150	(2) 125	(4) 100
	250 yards **60**	(3) 110	(5) 85	(6) 60
	225 yards **0**	(7) 50	(8) 25	(9) 0

Notice that we could have picked many other sets of numbers that would have worked, so there is some arbitrariness in the magnitudes of these numbers even though their relationships to each other are fixed.

Next suppose that Figure 4a represents the trade-offs Buyer 1 is willing to make between ball life and price. Starting with the values we just derived for ball life, Figure 4b shows a set of values for price that when added to those ball life reproduce the rankings for Buyer 1 in Figure 4a.

Figure 4a

Buyer 1		***Average Ball Life***		
		54 holes	**36 holes**	**18 holes**
Price	**$1.25**	1	4	7
	$1.50	2	5	8
	$1.75	3	6	9

Figure 4b

Buyer 1		***Average Ball Life***		
		54 holes **50**	**36 holes** **25**	**18 holes** **0**
Price	**$1.25** **20**	(1) 70	(4) 45	(7) 20
	$1.50 **5**	(2) 55	(5) 30	(8) 5
	$1.75 **0**	(3) 50	(6) 25	(9) 0

We now have in Figure 5 a complete set of values (referred to as "utilities" or "part-worths") that capture Buyer 1's trade-offs.

Figure 5

Average Driving Distance		*Average Ball Life*		*Price*	
275 yards	100	54 holes	50	$1.25	20
250 yards	60	36 holes	25	$1.50	5
225 yards	0	18 holes	0	$1.75	0

Let's see how we would use this information to determine which ball to produce. Suppose we were considering one of two golf balls shown in Figure 6.

Figure 6

	Distance Ball	*Long-Life Ball*
Distance	275	250
Life	18	54
Price	$1.50	$1.75

The values for Buyer 1 in Figure 5 when added together give us an estimate of his preferences. Applying these to the two golf balls we're considering, we get the results in Figure 7.

Figure 7

Buyer 1	*Distance Ball*		*Long-Life Ball*	
Distance	275	100	250	60
Life	18	0	54	50
Price	$1.50	5	$1.75	0
Total Utility		105		110

We'd expect buyer 1 to prefer the long-life ball over the distance ball since it has the larger total value. It's easy to see how this can be generalized to several different balls and to a representative sample of buyers.

These three steps--collecting trade-offs, estimating buyer value systems, and making choice predictions-- form the basics of conjoint analysis. Although trade-off matrices are useful for explaining conjoint analysis as in this example, not many researchers use them nowadays. It's easier to collect conjoint data by having respondents rank or rate concept statements or by using PC-based interviewing software that decides what questions to ask each respondent, based on his previous answers.

As you may expect there is more to applying conjoint analysis than is presented here. But if you understand this example, you understand what conjoint analysis is and what it can do for you as a marketer.