Understanding Customer Needs: A Systematic Approach To The "Voice of the Customer"

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Submitted to the Sloan School of Management
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ABSTRACT

This thesis analyzes customer feedback from interviews and focus groups to determine how many customer responses are required to fully reveal all customer needs for a product. It is the first large scale test of theory presented by Professor John Hauser in his research document "The Voice of the Customer".

The first part of the thesis groups 12,000 customer responses according to a set of major and minor characteristics developed by Professor Hauser. After grouping the data we check to see how closely it fits with a Beta-binomial approximation previously calculated by Professor Hauser in "The Voice of the Customer". This approximation helps market researchers determine the number of customers they need to interview.

The result of this research will have implications for companies who do extensive market testing for new product development.

Thesis Supervisor: Dr. John Hauser
Title: Professor of Marketing Science

ACKNOWLEDGEMENTS

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INTRODUCTION

As the cost of bringing new products to market becomes ever more expensive, market research for these products becomes increasingly important. These costs manifest themselves across a wide variety of areas such as slotting allowances, promotional/display allowances, sampling and advertising costs. Studies show that market research money spent 'up front' or early in the product's development cycle can save thousands or even millions of dollars by avoiding the re-work caused when product requirements are changed mid way through the cycle. But these saved dollars are not as tangible as the market research budget which appears in the income statement. Firms are demanding payback for their market research dollars and market research budgets are being strained by effective but costly research projects. In this atmosphere, market researchers have been forced to closely examine the cost effectiveness of obtaining consumer feedback and to maximize the 'bang per buck'.

This paper will analyze the results from 17 one on one interview sessions and focus groups. Using this data we will attempt to establish the level of market research required to produce reliable results and its effects on the ability of market researchers to uncover customer needs.

The paper will be divided into three sections and an appendix. The first section is an overview of how focus groups and one on one interviews are conducted and the kind and quality of the information they provide. Next there will be a discussion of how these techniques compare with each other and the advantages and disadvantages of each in determining customer needs.

The second section will introduce the conceptual model, describe the data collection and analysis process, and compare our data to Hauser and Griffin's as shown in "The Voice of the Customer". In particular we will describe the process of coding and transforming the data for modeling. In this section we will discuss the development of the Beta-binomial approximation, fitting the data, and estimating the parameters for the Beta-binomial model. We will also compare and contrast the Beta-binomial to a more complex factorial approximation. Lastly, we will analyze the distribution results as well as look at the model's strengths and weaknesses.

In the final section we will draw conclusions and strategic implications from the study and look at where future studies might be undertaken to increase our understanding in the area.

I FOCUS GROUPS AND INTERVIEWS

Our survey used data that was collected in one on one interviews, focus groups, and telephone focus groups. There are advantages and disadvantages to each. One on one interviews are expensive since they require very knowledgeable, and often highly paid, interviewers to devote themselves to only one customer. This setting allows the interviewer to control the conversation and probe more deeply into areas when appropriate. Focus groups reduce the number of interviewers required per customer. They tend to be less structured, more open ended than interviews and the group setting often brings out responses from customers who might be too shy in a one on one interview. The group dynamic sometimes brings out responses in people that might never have surfaced in one on one interviews. But control can get away from the focus group moderator as the group's attention strays from the intended course or as one member of the group dominates the discussion. Telephone focus groups save even more money since the interviewer can stay at the office, but the group tends to lose synergy as group members are physically separated (Lehmann).

All three methods were employed for this study. Where applicable, we will highlight any differences found in the amount of needs identified through the various methods. To do this we will isolate the variables according to how the interview was conducted (whether it was focus group or one on one) and which organization did the coding of the transcripts. By tabulating the amount of needs identified through each, we should be able to make some qualitative and quantitative observations about which methods and which team of analysts were able to reveal the most needs.

II METHODOLOGY

The Idea

Our objective in conducting this type of analysis is to determine exactly what customers want in a particular product or service. With this information the design team can build a product that better fits the needs of the customer. The costs of obtaining and analyzing this information can be as high as $10,000 per customer (Hauser and Griffin), so any reduction in the number of people who must be interviewed will have a direct and substantial impact on marketing budgets. The objective of our analysis is to determine just how many individuals must be interviewed to obtain a given level of needs. Providing this information to the market researcher should aid in successful product development. Armed with this knowledge market researchers can become more efficient with their limited budgets.

Collecting the Data

The raw data for our analysis was collected by experienced interviewers during 17 focus group sessions and one on one interviews. Customers were quizzed to determine just what they wanted from vendors of business equipment (The authors are intentionally vague to preserve the identity of the client). In these sessions the specific phraseology that the customer used is very important because subtle nuances that give insight into customer needs can be lost when responses are paraphrased. Thus, recorded interviews were transcribed word for word in order to retain the "voice of the customer". The transcripts from these sessions were then independently analyzed by three separate groups: the client, a market research firm, and a management consulting firm, from here on referred to as I, R, and M respectively.

Evaluating the Raw Data

Two analysts from each company were assigned to evaluate the transcripts and to identify the specific customer needs. The analysts reduced these needs to single sentences or even sentence fragments making sure to retain the customer's exact language. "Choice of how I pay for it" is an example of how one need was worded. As might be expected, identifying specific customer needs from the interview transcripts is a very subjective task so the lists that were generated by each company differed somewhat. When the three companies lists were combined a total of 12,000 needs had been identified. The data the authors received from I, R, and M consisted of sentences and sentence fragments coded to show which customer it was from and which of the three analyst teams had identified it. Since the three firms had evaluated the same raw data there was much overlap in identified needs. In addition, many of the customers had mentioned the same needs. Next we categorized each need and eliminated duplicate and falsely identified needs.

Structuring Customer Needs

In addition to the 12,000 coded customer phrases, we were also provided with an affinity chart of of customer needs. The analysts from the client had constructed this affinity chart based on 230 of their coded customer phrases. With each phrase written on a card, they grouped similar cards together and developed a three tiered hierarchy of primary, secondary, and tertiary customer needs. (Another newer method of developing this hierarchy is through a customer sort. In a customer sort a similar process is undertaken to develop the hierarchy of customer needs. But this time the customer instead of the product development team chooses the grouping of the cards. It was

shown in "The Voice of the Customer" (Hauser and Griffin) that identifying customer needs this way is superior to either affinity factor analysis or affinity charts assembled by product managers. In general, consumer product companies have found customer sorts to generate a better structure for developing their product). If the affinity chart is structured correctly there should be a correlation between what the client categorized as primary needs and what was identified by a majority of the customers.

Categorizing the Data

The two authors and one undergraduate divided the 12,000 phrases from I, R, and M into three groups so that the sentence/sentence fragments could be concurrently evaluated. Armed with the affinity chart identifying primary, secondary, and tertiary attributes, we classified each phrase into one of the 230 categories. If it fit into one of these three categories it was coded with a five digit number that identified which particular need it had revealed. For example, "They have the lowest price" would be 11504.

The analysts from the three firms tended to be very conservative in identifying customer needs from the interview transcripts. They included many phrases that were not needs just to insure that no actual needs were omitted. As a result, many sentence/sentence fragments were incorrectly included as needs. In these cases the the phrase was left uncoded and eliminated from our analysis. Approximately 70% of the phrases were either duplicates or were not actual needs. This is not surprising considering each firm analyzed the same transcripts. With the remaining phrases coded we could then proceed with our empirical analysis.

Mathematical Modeling: Data Approximations

To analyze the coded needs we organized our data into a matrix consisting of the 17 customers on the y axis and the 230 needs along the x-axis. Given this structure, the probability that a customer will identify a particular need can then be characterized by the notation P(i,j), which is the probability that the ith customer identifies the jth need (see appendix 1 for the actual matrix).

Beta-binomial Distributions

Completing our matrix allowed us to plot a distribution of the customer's revealed needs. For comparison, an example of this distribution taken from Hauser and Griffin's "Voice of the Customer" is shown below in figure 1.

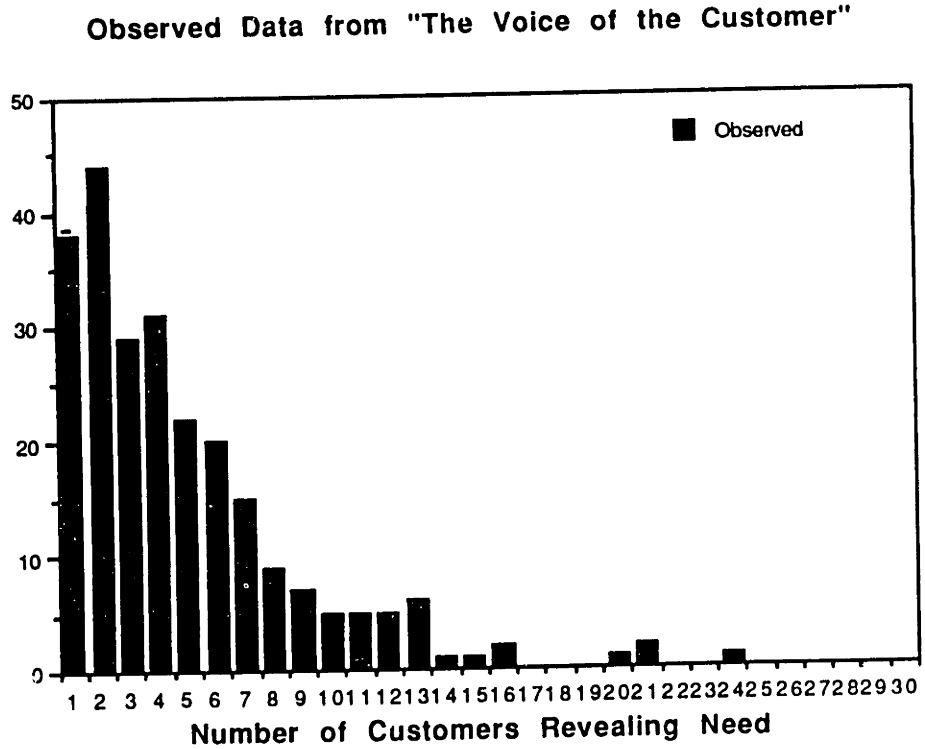


Figure 1

Here we find that there are many needs revealed by eight customers or less and relatively few needs revealed by nine or more customers. In order to

understand why this occurred we must look at the underlying data more closely.

Our matrix of customers (1 to 30) vs needs (1 to 230), enabled us to determine the number of customers that identified each need. The range of possible values this could assume was between 1 and 17. At least one customer had to mention the need or it would not have been listed and a maximum of 17 was possible if every customer mentioned the need. figure 2 shows how many needs were identified by only one customer, how many were identified by two customers, etc. In the first column we found that eight needs were identified by only one customer, these were the very low probability, less universal needs. In the second column we found 20 needs identified by two customers, again a low probability need. As we go further right on the graph we go toward higher probability, commonly voiced needs that were revealed by many customers.

Figure 2, shown below, can be directly compared to "The Voice of the Customer" data in figure 1. The shallow slope at the right hand tail of Hauser

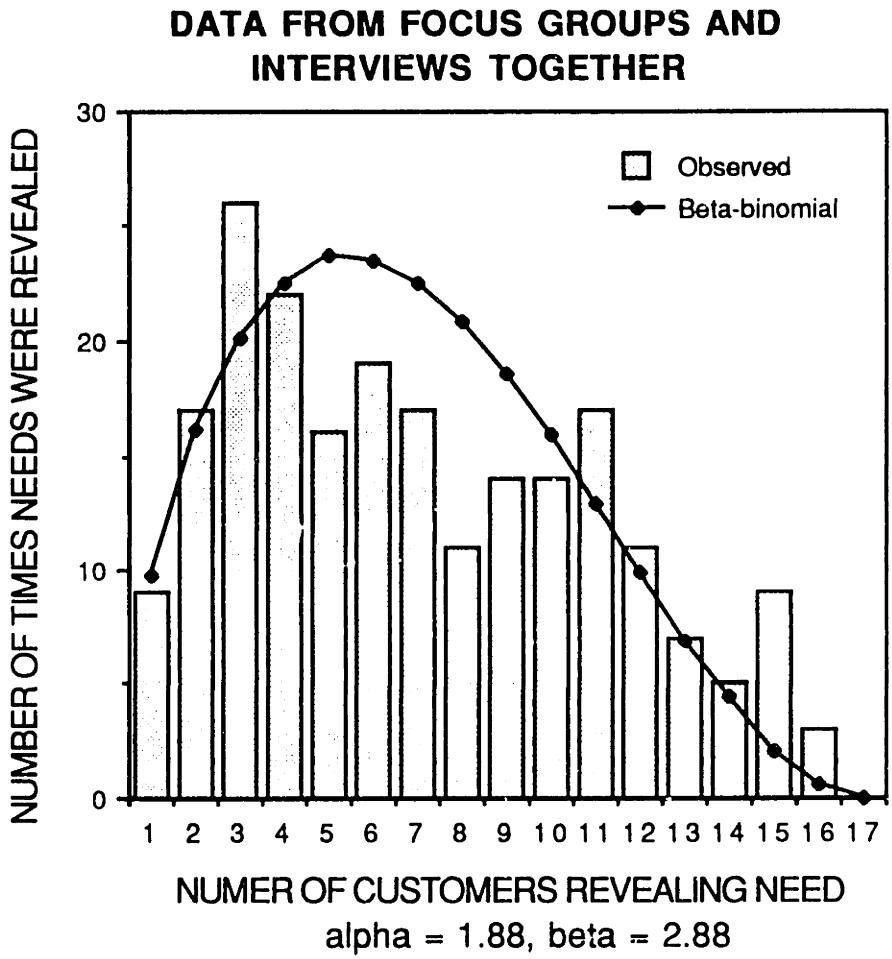


Figure 2

and Griffin's data shows that only a few needs were identified by almost all of the customers. These were probably the more important, primary needs.

Hauser and Griffin's graph had only four needs identified by 20 or more customers. By contrast, our data has a short, steep right hand tail with many common needs voiced and relatively few needs identified by only one or two customers. There are several possible explanations why our observed data was so different from Hauser and Griffin's: our study mixed one on one interviews with focus group data while their's relied exclusively one on one interviews; our's was a very complex product while their's was simple; and

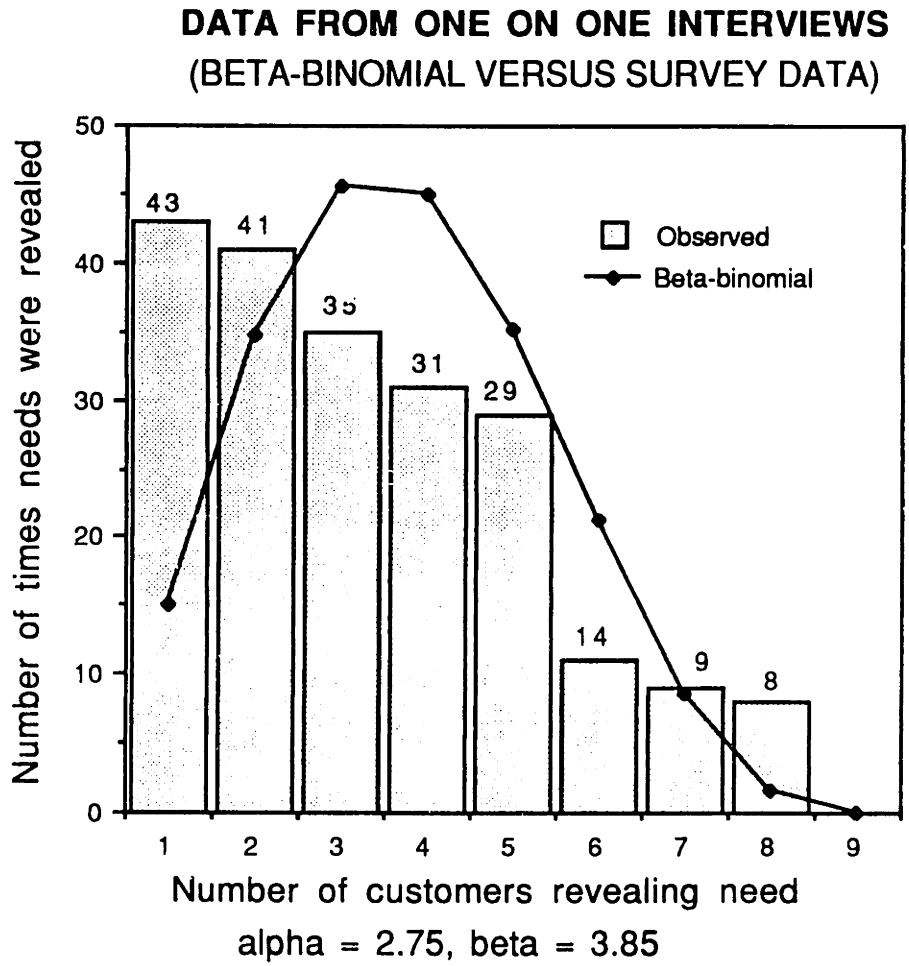


Figure 3

our's may have had a more homogeneous customer base compared to theirs (A homogeneous group of customers would have fewer needs that were identified by only one or two people while a more diverse group might have many needs voiced that no other customers mentioned). Further study is required to determine the factors that shape the beta distribution.

Focus group vs one on one

Our analysis of the observed data led us to look at the processes by which our data was acquired. A comparison of focus groups to one on one interviews showed some surprising differences, see figures 3 and 4.

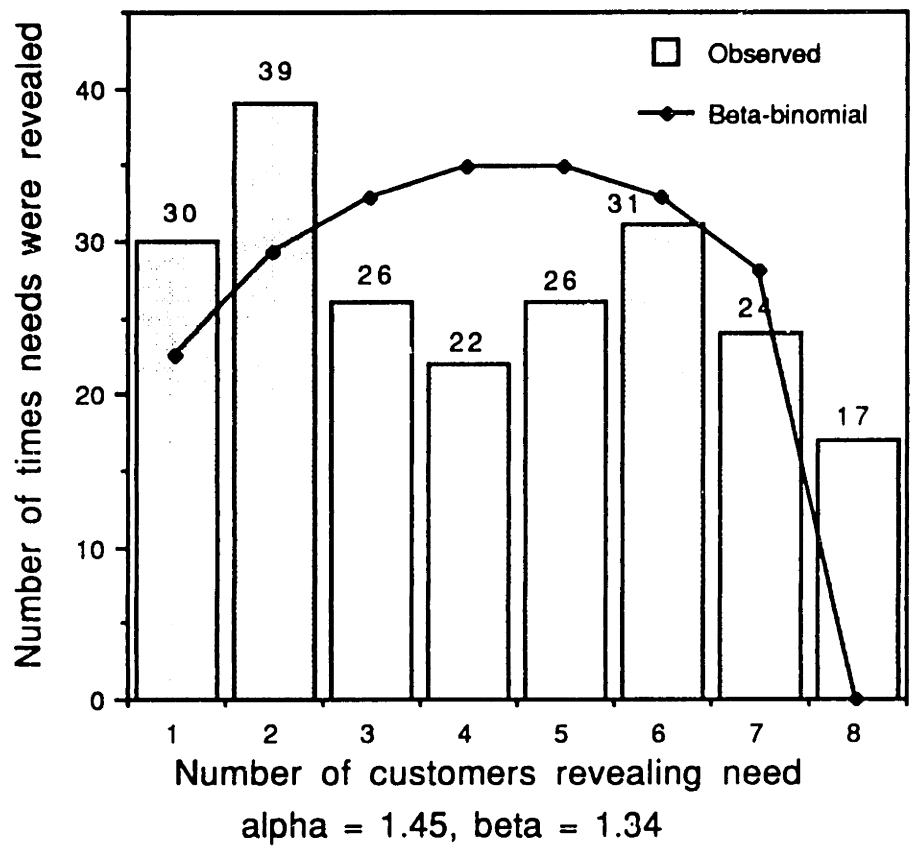


Figure 4

While the observed data for the one on one interviews was downward sloping, similar to that found in "The Voice of the Customer", the observed data for the focus group interviews was almost uniform. As you can see in Figure 4, the focus group customers display the usual downward slope over customers 1 to 4, but rise unexpectedly from customers 4-6. This unusual distribution had 30 needs revealed by only one customer and 31 needs revealed by six customers. Thus, there was much more congruity shown between the focus groups customers then between one on one interview customers. The difference between the format is likely the reason the two types of customers vary in their ability to reveal needs. Since focus groups

consist of six people rather than one there is a tendency for answers to be more homogeneous.

The Cumulative Beta-binomial Analysis

The number of customers that must be interviewed in order to reveal a specific percentage of customer needs is an important question for market researchers. Obviously, interviewing more customers will reveal more of the needs, but marketing managers would like to make informed decisions on how many people they interview, balancing the percentage of needs revealed against the time and costs of revealing incremental needs through additional interviews. The Beta-binomial statistical model has proven to closely predict this relationship.

We must start with three basic assumptions:

1) Each customer has the same ability to identify a need. Every one on one interview or focus group session can be considered an independent random draw from a pool of all of the interview and focus group sessions. The distribution which reflects this random sampling of customers is the binomial distribution. This distribution, given by (n chose p) (p)n q(1-n), allows us to calculate the probability that we will choose the kth customer out of a population of N(k). Thus, the response from any customer will have no effect on the responses from any other customer (In focus groups customers do effect each other since they are essentially in a conversation. We treated the responses from each focus group as though they came from an individual customer, so the independence assumption is still reasonable).

2) There is independence between needs. Knowing that a customer identified a particular need does not change the probability that they will identify any other need. So, for example, if we knew that customer 8 identified needs 10, 23 and 221 this would tell us nothing about the probability of any other need being revealed by that customer.

3) We assumed the beta distributions across all customers were the same, that is, the P(1..i, j) is the same. Since some needs are more easily voiced than others the probability they will be revealed during a session is higher. We assumed that this ability to voice a particular need was the same across all customers. Thus, some needs will be easy to identify, others will be difficult, some will have low probabilities, others high.

The Beta-binomial Model

To understand how customer needs were distributed we needed to know the probability that a customer would identify a particular need. This could be determined by using the Beta-binomial model.

To calculate the Beta-binomial we first needed to tabulate our survey data and determine the survey mean and variance. With the mean and variance in hand we could then find the value of constants α and β (shown below). This was accomplished by using the "method of moments" equations (Greene) and iterating α and β until the mean of the frequency distribution (equation 1) and the frequency variance (equation 2) matched those in the survey.

$$\sigma^2 = \frac{M\alpha\beta*(\alpha+\beta+M)}{(\alpha+\beta)^2(\alpha+\beta+1)} \qquad (1)$$

$$\mu = \frac{\alpha * M}{(\alpha+\beta)} \qquad (2)$$

We then used the values of α and β to input into the Beta-binomial formula shown below (equation 3).

$$E_n = 1 - \frac{\Gamma(n+ß)\,\Gamma(\alpha+ß)}{\Gamma(n+\alpha+ß)\,\Gamma(ß)} \qquad (3)$$

where Γ is the gamma function,

α is the alpha constant,

ß is the Beta constant, and

n is the number of needs.

M is the number of customers

It should be noted that the Beta-binomial distribution does not describe the data perfectly for customer numbers from 2 to 12 (Hauser and Griffin), but it does provide a closer approximation to the survey data as n increases. This deviation between the model and empirical data should not be too disturbing to market researchers since they are more interested in the higher ranges of the distribution - how many customers must be interviewed to get 90% or 95% of all customer needs.

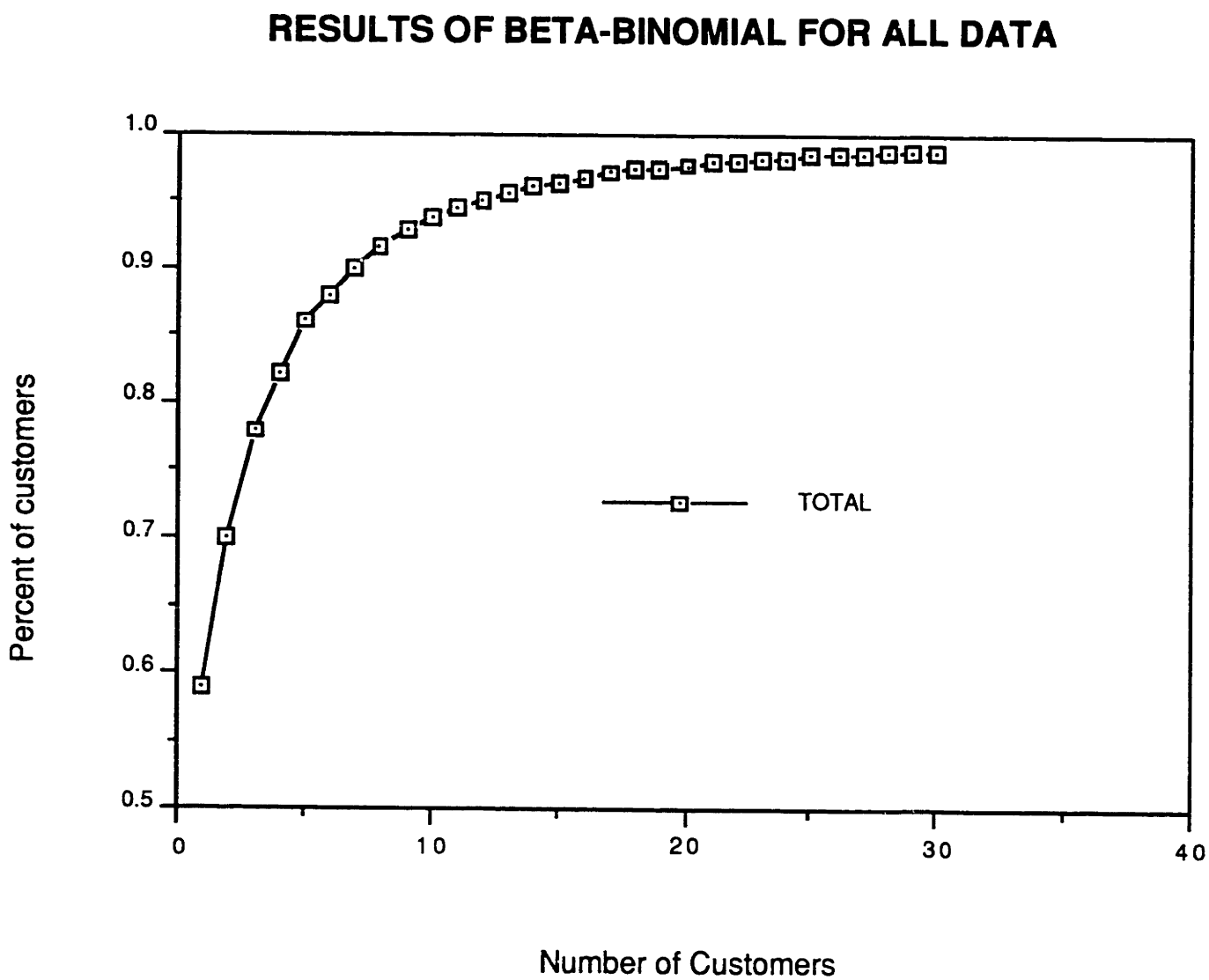
Results of the Cumulative Beta-binomial

As figure 5, on the following page, shows, it is possible to determine how many customers must be interviewed to reveal a specific percentage of the customer's total needs. For example, 12 customers will reveal roughly 95% of

all customer needs. As we can see, with each successive customer the ability to identify incremental needs decreases. Thus, each additional customer interviewed yields marginally fewer needs.

One thing that is immediately noticeable is the similarity between our results and the results suggested in Hauser's and Griffin's work. But, our results are even more aggressive, showing that fewer customers are needed to reach the 95% need identification level that corporations seem comfortable with. We reached the 95% need identification point in only 12 customers compared to Hauser and Griffin's work where approximately 24 customers were required to identify the same percentage of needs. Our results suggest that corporations designing a complex product or service might feel comfortable interviewing far less than 30 customers as Hauser and Griffin did.

Figure 5


RESULTS OF BETA-BINOMIAL FOR ALL DATA
Percent of customers
1.0
0.9
0.8
0.7
0.6
0.5
0
10
20
30
40
TOTAL
Number of Customers

A Comparison of Focus Groups and One on Ones

The graphs of the cumulative Beta-binomial are consistent with the results from the Beta-binomial. One on one interviews yield more at every level of customers than for focus groups. We can predict this result from our earlier Beta-binomial graphs where we saw that the survey data for one on one interviews were more diverse than the groupings for focus groups. As the number of customers interviewed grows, the difference between the percent of needs revealed for focus groups and one on one grows wider. Even after interviewing 30 customers, the focus groups do not yield 96% of the needs that market researcher find desirable. By contrast the one on one interviews yield 95% of the revealed needs after interviewing 12 customers. (for the entire results for all levels of customers please see Appendix 2).

One possible explanation for why one on one interviews seem to yield better results than focus is groups is that the one on one interviews provide a better forum for customers to express a more diverse range of needs.

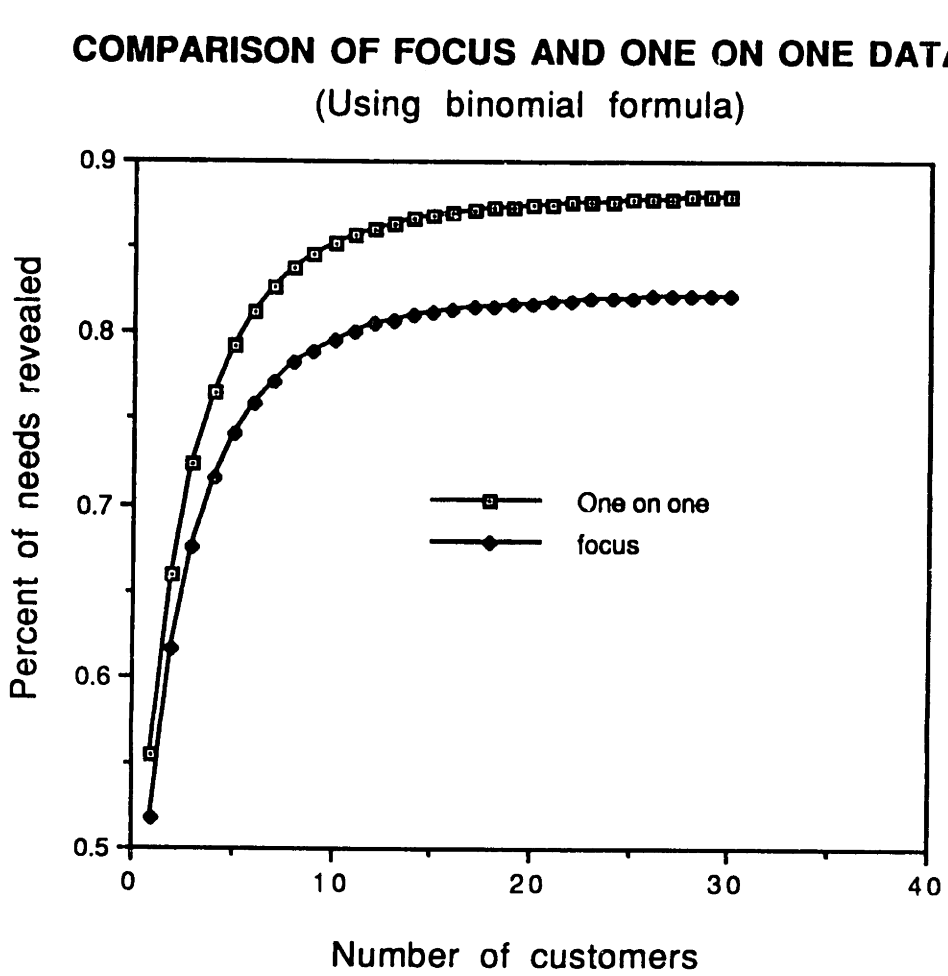


Figure 6

An Alternative Approximation

In our earlier discussion of the differences between the Beta- binomials for focus groups and one on one interviews, we noted that the observed data did not seem to fit our Beta-binomial model. This may have resulted from the lack of data points for focus groups and one on one interviews. Another method of approximating the observed data uses factorial analysis. By calculating the probability that a particular person or group of people are likely to cite a particular need we can come up with an alternative to the Beta-binomial model for groups of less than 12. For example, if we make the same assumption of independence between customers, then the probability that

one person (n=1) is included in a group of eight customers is simply one eighth minus one for the customer himself. We can expand this by calculating the probability that two people (n=2) are found in a group eight, etc. When n = 8 we have arrived at the total probability that any person or group of customers can be found in a particular subgroup. We then iterate this process for the eight subgroups included in the focus groups (or nine for the one on one interviews) until we arrive a set of probabilities for all the subgroups. This data is shown in appendices 2 and 3. These probabilities can then be weighted by the actual survey results allowing us to plot the graph for the first 8 data points. The generalized formula for calculating the results is the following:

$$F(n) = \sum_{l=1}^{m} N(l)\, f(l,m,n)/230$$

where

$$f(l,m,n) = 1 - [(m-n)(m-n-1)\ldots(m-n-l+1)/ m(m-1)(m-2)\ldots(m-l+1)]$$

and where

n = number of customers identifying the need
m = total number of customers in sample
l = number of common needs

This method, while more complex, should provide a closer approximation to the observed data. Below, in figures 7 and 8, we can see the results from using the factorial method. The factorial depiction of the one on one data is similar to those from the Beta-binomial. However the factorial model's slope is steeper indicating that interviewing only a few customers results in far fewer revealed needs. For example, for one on one interviews, one customer reveals a little more than 30% of total needs versus over 55% using the Beta-binomial model.

Using the Factorial method to approximate revealed needs

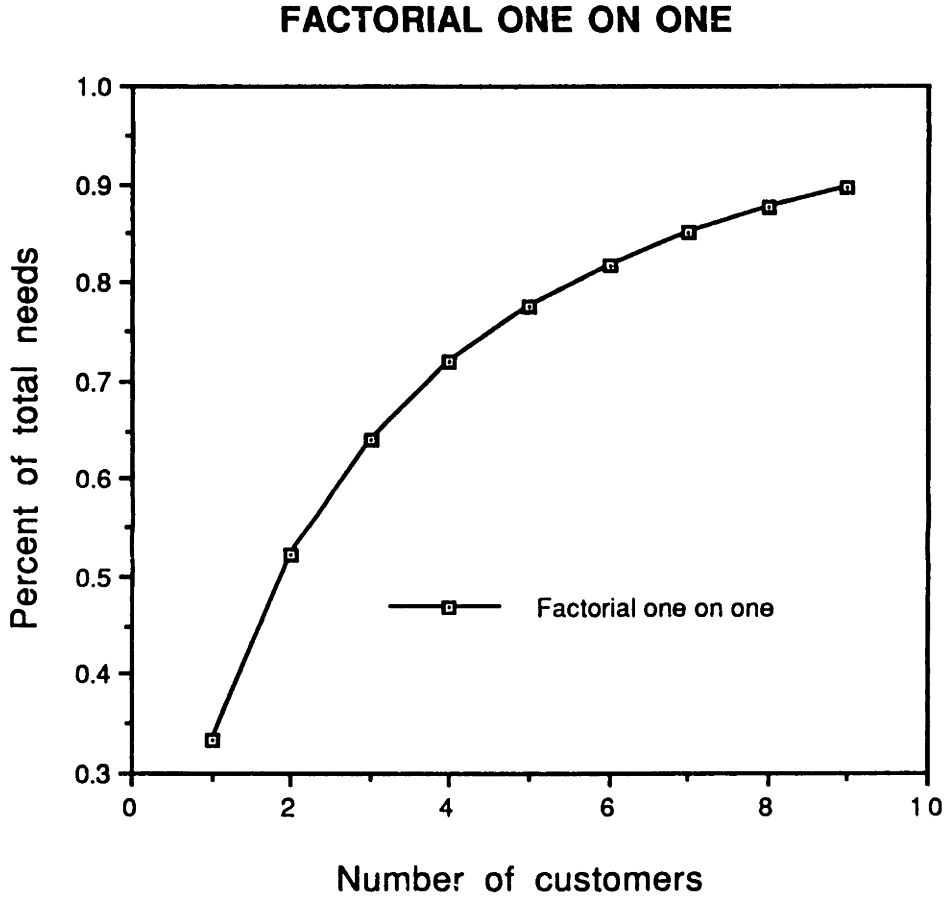


Figure 7

As the number of customers increases, the differences between the factorial model and the Beta-binomial models begins to disappear. 9 customers reveal roughly 90% of the needs which is the same result we found using in our cumulative Beta-binomial.

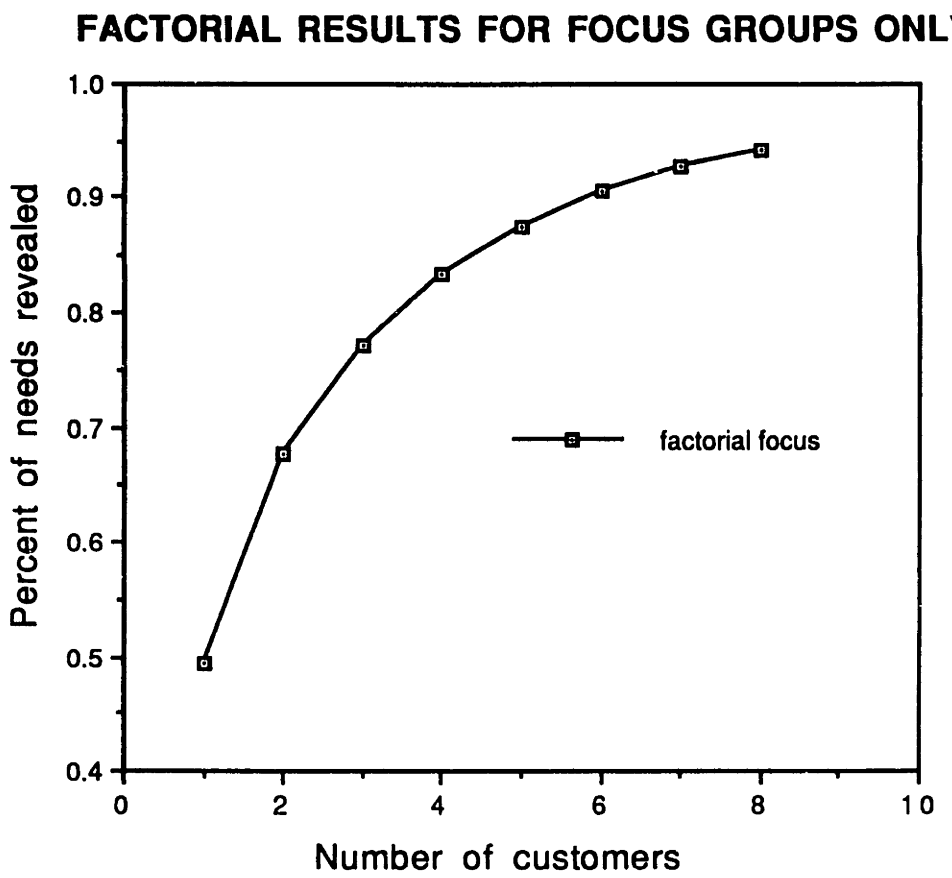


Figure 8

Looking at focus groups with the factorial method shows fairly dramatic increases in revealed needs as the number of customers interviewed increases, see figure 8 above. The initial customer yields 50% of revealed needs and this rises dramatically to 90% after interviewing only 6 groups; a result slightly better than that for the one on one interviews.

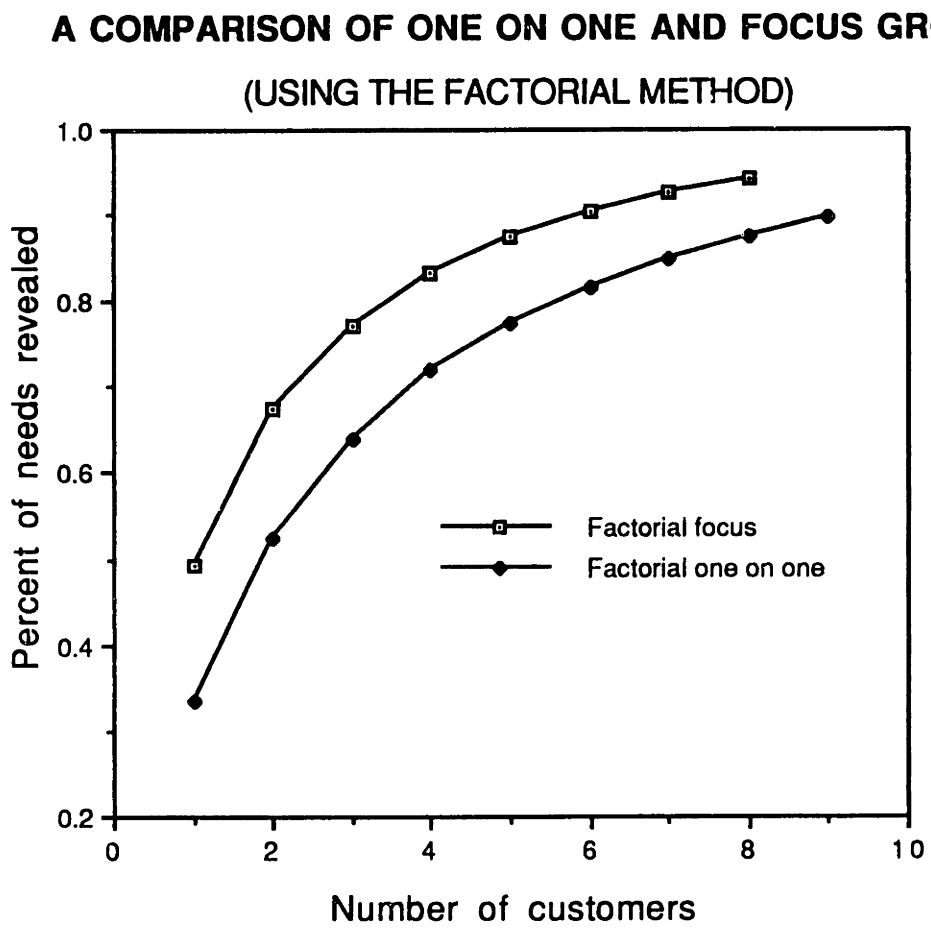


Figure 9

Comparing One on One with Focus Groups--Factorial Method

Comparing one on one interviews with focus groups by the factorial method, (in figure 9) shows more similarities than when we compared them using cumulative Beta-binomials since the curves rise at the same rate. But here the results are reversed, in the factorial method focus groups reveal more needs than one on one interviews.

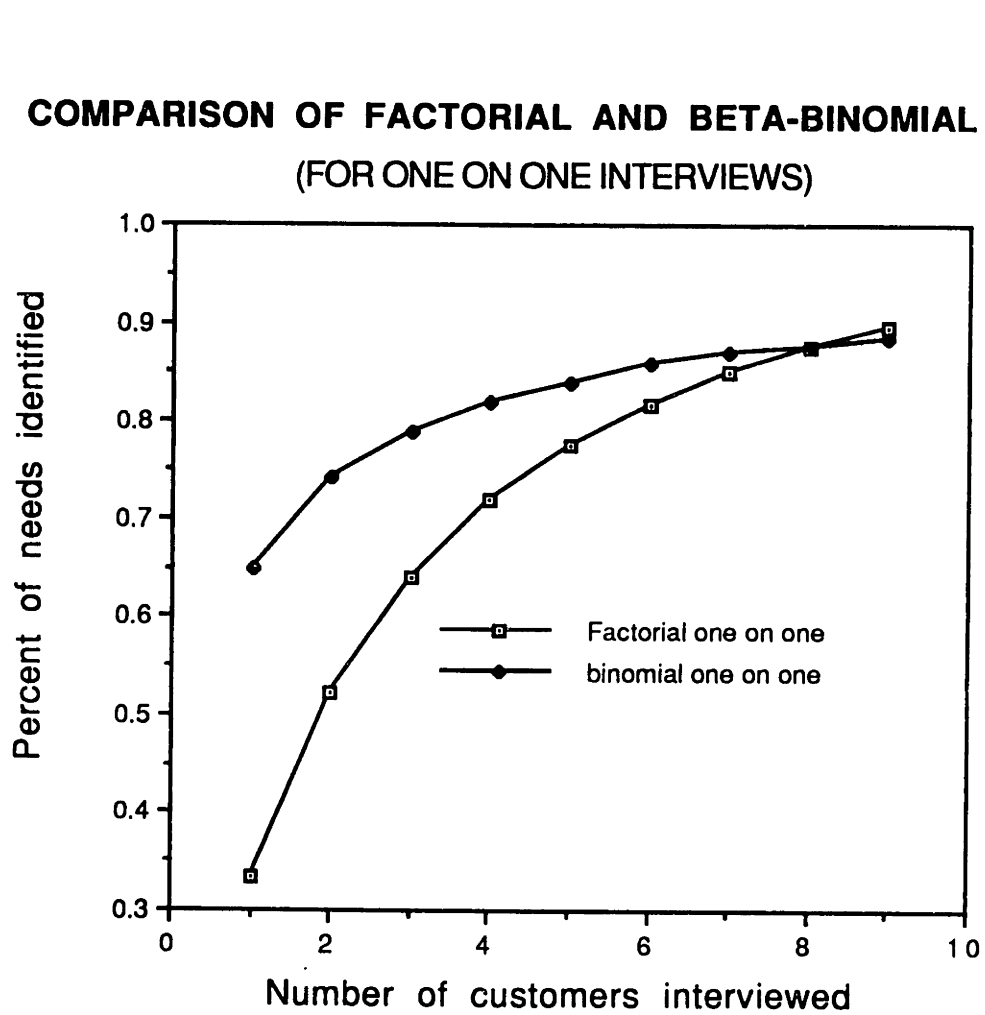


Figure 10

A Comparison of Factorial and Beta-binomial Methods

When we compare the results from the factorial method with the results we obtained through the Beta-binomial , we can see that for both one on one (see figure 10) and focus groups (figure 11), the factorial method reveals fewer needs when interviewing only a few customers. However, as we interview more customers, the factorial method shows more revealed needs than the Beta-binomial.

A COMPARISON OF THE FACTORIAL AND BETA-BINOMIAL METHODS

(FOR FOCUS GROUPS ONLY)

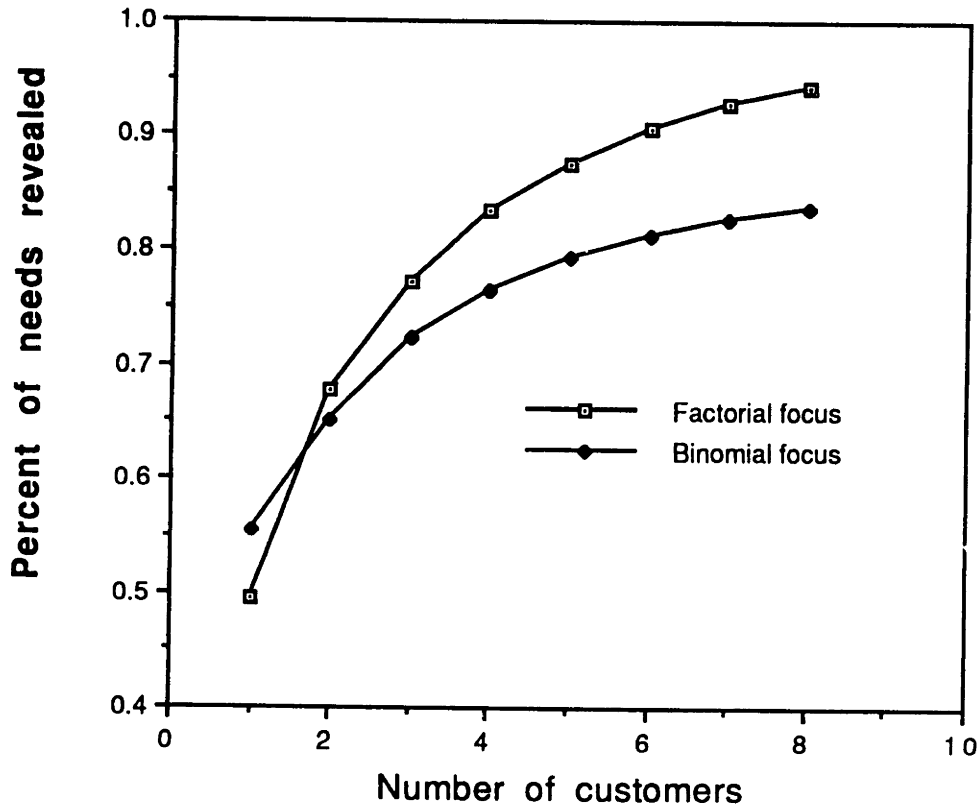


Figure 11

Comparing the results from the factorial method with the Beta-binomial for all data points, the results are again predictable. The factorial method yields fewer revealed needs with the first customer, but from the second customer on, it begins to show more revealed needs than the Beta-binomial method.

A COMPARISON OF THE CUMULATIVE BETA-BINOMIAL WITH THE FACTORIAL METHOD
(FOR TOTAL, ONE ON ONE AND FOCUS GROUPS)

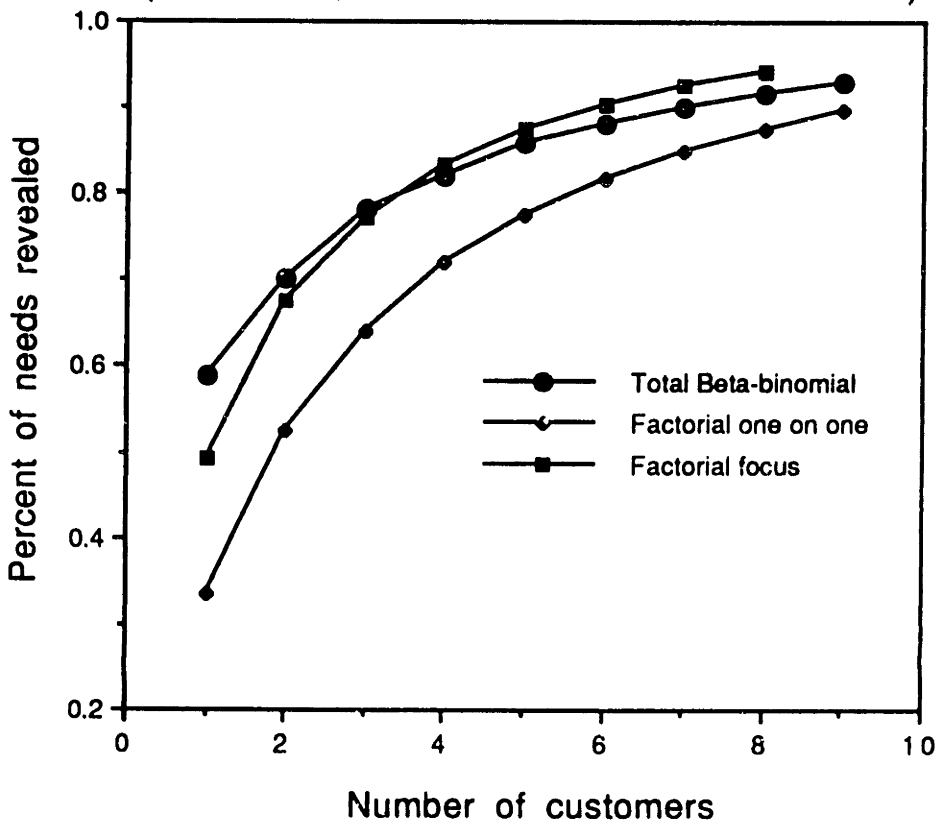


Figure 12

Comparing the results for the total number of customers interviewed from the cumulative Beta-binomial graph with the focus group and one on one interviews using the factorial method shows little new information. As we would expect, the graph for the total Beta-binomial data reveals more needs with few customers. But, as more customers are added, the Factorial method for focus groups surpasses the Beta-binomial and the Factorial method for one on one approaches the Beta-binomial curve.

Professional vs non professional analysts

We must also compare the performance of the analysts who evaluated the interview and focus group transcripts to identify needs. The analyst's ability to identify needs varied significantly between firms as shown below.

	I	R	M
Number of actual needs coded	577	828	1684
Total needs coded including false needs	730	1524	4915
% of useable data identified	34.2	34.5	25.7
% of the 230 needs identified	82.6	71.0	95.6

The percentage of useable sentence fragment generated by the management consultants was significantly lower than the percentage from either the marketing consultants or the clients themselves. But the management consultants identified a much higher percentage of the 230 affinity chart needs. So, while the management consultants identified the most needs, they also had the highest level of falsely identified needs.

III STRATEGIC IMPLICATIONS AND CONCLUSIONS

1) Beta-binomial

The Beta-binomial formulas closely mirrored the results expected from the survey data and indicated that researchers may be able to interview fewer customers while still revealing 95% of customer needs for relatively complex products or services. Our results for the Beta-binomial agreed largely with the results from "The Voice of the Customer" and perhaps was even a bit more optimistic about the ability to capture most needs from interviewing less than 30 customers. While the graph of the total survey results seemed to be modeled fairly well by the Beta-binomial model, when we tried to refine the analysis to distinguish between the focus groups and one on one interviews we came into the problem of trying to build a model around too few data points. The highly irregular shape of the focus group graph led us to wonder if there might be a better way to model small numbers of customers.

2) The Factorial Model

We developed the factorial model to help us model results for less than 15 customers. By finding the probability that one to n needs will be found within a certain category of customers having m needs, we can predict the number of needs revealed in small customer surveys with greater certainty. This model which we called the Factorial model gave us results which seemed to do a better job of mirroring reality. For example, the Factorial model showed that a one on one customer was likely to reveal 37% of needs rather than the highly unlikely 55-60% that was predicted using the cumulative Beta-binomial method.

3) Focus group vs one on one

The Beta-binomial and the Factorial methods of analysis yielded conflicting results. While the Factorial analysis showed focus groups superior to one on one interviews, the cumulative Beta-binomial results indicate that one on one interviews were far more likely to yield more needs than focus groups.

The differences in our observed data between focus groups and one on one interviews suggests that one on one interviews allowed individuals to express a wider diversity of opinion. As a result, the Beta-binomial method shows that one on one interviews provided a greater number and wider variety of needs than focus groups. In general, a wider variety of opinions is desirable because it results in a greater number of needs revealed from fewer customers. Regardless if one on one interviews more effective, they are certainly less expensive to administer since fewer dollars are spent on recruiting and screening respondents. These results must be analyzed further to determine if the second rise shown in our one on one interview data has significance or if this shape was just due to statistical fluctuation. Differences in their Cumulative Beta-binomial distributions were minor. Due to the small number of customers interviewed, the authors feel that the Factorial method is more reliable. Other products or customer groups might well lead to different results.

4) Professional vs non professional analysts

Our results showed that professional analysts were able to reveal more needs but that a higher percentage of these needs were falsely identified, leading to more time and money spent during the transcript analysis and subsequent coding procedures. Having the client code their own transcripts leads to less

time spent and perhaps higher quality results since they have a stake in the final product. An added benefit is that the client will be part of the analysis team and therefore may have more confidence in the results.

Caveats

There were two aspects to our study that could have distorted our results and that should be mentioned. First we must consider the initial affinity chart. In our case this chart was quickly put together by three personnel from the client who skimmed the entire 12,000 sentence data set and selected 230 for the affinity chart. This method short circuited the normal affinity chart process which would have taken much more time to do properly. As a result, a few needs were left out (for example, 'compatibility with the company's existing equipment').

Second, the Beta-binomial distribution in the range from 2 to 12 is inaccurate due to mixing of the respondent needs. Our Beta distribution for customers revealing needs is similar to Hauser and Griffin's. But Hauser and Griffin's 95% need identification level was near 24 compared to ours at 12.

5) Areas for Further Study

Our study indicates that fewer customers could be interviewed to reach the 95% need identification level. This money saving possibility should be further researched. The unusual shape of the one on one interview data may reflect the complexity of the product or differences between one on one interviews and focus groups and should be further investigated. And more study is required to determine the various factors that shape the Beta-binomial distribution.

REFERENCES

Greene, Jerome D. (1982), *Consumer Behavior Models For Non-Statisticians*, (Praeger Scientific: New York, NY).

Hauser, John R. and Griffin, Abbie (1990), "The Voice of the Customer"

Lehmann, Donald R. (1989), *Market Research and Analysis*, Third Edition (Irwin: Homewood, IL)

APPENDIX 1

				1000	1100	1101	1102	1103	1104	1105	1106
cust 111	38	0.17	1	0	0	1	1	0	0	0	0
112	71	0.31	2	1			1				
113	73	0.32	3	0	1	0	1	1	0	0	0
114	96	0.42	4	0	0	1	0	1	1	1	1
115	74	0.32	5	1	1	1	1	1	1	0	1
117	56	0.24	6	1	1		1		1		
118	77	0.33	7		1			1			
123	86	0.37	8	0	0	1	0	0	0	0	0
124	123	0.53	9	1	1	0	1	1	1	0	0
				4	5	4	6	5	4	1	2
223	98	0.43	10	1	1	0	1	1	1	1	0
224	105	0.46	11	1	1	0	1	1	1	0	0
231	122	0.53	12	0	1	0	1	1	1	0	1
232	119	0.52	13	1	1	0	0	0	1	1	0
233	114	0.50	14	0	1	0	1	1	0	1	0
234	127	0.55	15	1	1	0	0	1	1	0	0
235	111	0.48	16	0	1	1	0	1	1	1	0
421	98	0.43	17	0	1	0	0	1	1	1	0
		avg	var	7	13	5	9	12	11	6	3
		0.406	1.668	4	8	1	4	7	7	5	1

APPENDIX 1

1107	1108	1200	1201	1202	1203	1204	1205	1300	1301	1302	1303
0	0	0	0	1	1	0	1	1	0	0	0
1	1	0	1		1						
0	0	0	1	0	1	0	1	0	0	0	0
0	1	1	1	0	1	1	1	1	0	0	0
1	0	1	0	0	0	0	0	1	0	0	0
				1				1		1	
		1						1		1	
0	0	0	0	0	0	1	0	0	0	0	0
1	1	1	1	1	1	1	0	1	0	1	0
3	3	4	4	3	5	3	3	6	0	3	0
1	0	1	0	0	0	0	0	1	0	1	0
0	0	0	0	1	0	1	0	1	0	1	0
1	0	1	1	1	0	1	0	1	1	1	1
1	0	1	1	0	0	1	0	1	1	1	0
0	0	1	1	1	1	0	0	1	1	1	0
0	1	0	1	0	0	0	0	1	0	1	0
0	1	1	1	0	0	1	0	0	1	1	0
1	1	0	0	1	1	0	0	1	0	0	0
6	5	9	8	7	6	7	3	13	4	10	1
4	3	5	5	4	2	4	0	7	4	7	1

APPENDIX 1

1304	1305	1306	1307	1308	1400	1401	1402	1403	1404	1405	1500
0	0	0	0	0	0	0	0	0	0	0	0
					1						
0	0	0	0	1	0	0	0	0	0	0	0
0	1	0	0	1	1	0	0	0	0	0	0
0	1	0	0	0	1	0	0	0	1	0	0
									1		
	1									1	1
0	0	0	0	0	0	1	0	1	0	0	0
1	0	0	1	1	1	0	0	1	1	0	1
1	3	0	1	3	4	1	0	2	3	1	2
1	0	0	1	0	0	0	0	1	0	0	1
0	0	0	0	0	0	0	0	0	0	0	1
0	1	0	1	0	0	0	0	0	0	1	1
0	1	0	0	0	1	1	0	1	0	1	1
0	0	1	0	0	0	0	0	0	0	0	1
0	0	0	0	0	1	0	1	0	1	0	1
0	0	0	0	0	0	0	1	1	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0
2	5	1	3	3	5	2	2	5	5	4	8
1	2	1	2	0	2	1	2	3	2	3	6

APPENDIX 1

1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512
0	0	0	0	0	1	0	0	0	0	0	0
						1		1			0
0	0	1	0	0	0	0	1	1	0	0	0
1	0	1	0	0	1	0	0	1	0	0	1
0	0	0	0	0	1	0	0	1	0	0	0
				1					1		
		1		1	1				1	1	1
0	0	0	1	0	0	0	1	1	0	0	0
1	0	1	1	0	1	1	0	0	1	1	0
2	0	4	2	2	5	2	2	5	3	2	2
1	0	0	0	0	0	1	1	0	1	1	0
0	0	0	1	1	1	0	0	0	0	1	0
0	1	1	1	1	1	1	0	1	1	1	1
0	0	0	0	1	0	1	1	0	0	1	1
0	0	1	1	0	0	0	1	0	1	0	0
0	1	1	0	1	1	0	0	0	1	1	0
0	0	0	1	1	1	0	0	1	0	0	0
0	1	0	1	0	0	0	0	1	1	0	0
3	3	7	7	7	9	4	5	7	8	7	4
1	3	3	5	5	4	3	3	3	5	5	2

APPENDIX 1

1513	1514	1515	1516	2000	2100	2101	2102	2103	2104	2105	2106
0	0	0	0	0	0	0	0	1	0	1	0
0	0	0	0	0	0	1	0	0	1	0	1
0	0	0	0	0	1	0	0	0	1	1	1
0	0	0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	1	0	0	0
	1				1				1	1	1
0	1	0	0	0	0	1	1	0	1	1	1
0	0	1	0	1	0	0	0	1	0	0	1
0	2	1	0	1	2	2	1	3	5	4	5
0	0	0	0	1	0	0	0	0	0	0	1
0	1	0	0	1	1	0	0	0	1	1	1
1	1	0	0	1	1	1	0	0	1	1	1
1	1	1	1	0	1	0	0	0	1	1	0
0	0	0	0	1	1	0	1	0	1	1	1
0	1	0	1	0	1	0	0	0	0	1	1
0	0	0	0	0	1	0	0	1	1	1	1
0	0	0	0	1	1	1	0	1	1	1	1
2	6	2	2	6	9	3	2	5	10	11	11
2	4	1	2	5	7	2	1	2	6	7	7

APPENDIX 1

2107	2108	2109	2110	2111	2112	2113	2200	2201	2202	2203	2204
0	0	0	0	0	0	0	0	1	0	0	0
0	1	1	0	0	0	0	0	0	0	1	0
1	1	1	0	0	0	0	0	0	0	1	0
1	1	1	0	1	1	0	1	1	0	1	1
1	1	1	0	1	1	0	0	0	1	1	0
		1		1				1			
1		1		1						1	
0	0	1	0	0	0	1	0	0	0	0	1
0	1	1	1	0	0	1	0	1	0	1	1
4	5	8	1	4	2	2	1	4	1	6	3
0	0	0	0	0	0	0	0	1	0	1	1
0	1	1	0	0	0	0	1	1	0	1	0
1	1	1	0	1	0	0	0	1	0	1	1
0	1	1	0	1	0	0	1	1	0	1	0
0	0	1	1	1	0	0	1	0	0	1	1
0	1	1	0	1	1	0	1	1	1	1	1
0	0	1	0	0	0	0	1	0	0	1	1
0	0	1	1	1	0	0	0	1	1	1	1
5	8	14	3	9	3	2	6	10	3	13	9
1	4	7	2	5	1	0	5	6	2	8	6

APPENDIX 1

2205	2206	2207	3000	3100	3101	3200	3201	3202	3203	3204	3205
0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	1	0	0	0	1	0	0	0	0
1	0	0	1	1	1	1	0	0	1	1	0
1	1	1	1	0	1	1	0	0	0	1	0
1	0	0	0	0	1	1	0	0	1	1	0
	1		1			1					
			1	1		1				1	
1	0	0	1	0	1	1	0	0	0	0	0
1	0	0	1	1	1	1	0	1	0	0	0
6	3	1	7	3	5	7	1	1	2	4	0
1	1	1	1	1	1	1	0	1	0	0	0
1	1	0	1	1	1	1	0	0	0	0	0
0	1	0	1	1	1	1	0	1	0	0	0
1	1	0	1	1	1	1	0	0	0	0	0
1	1	0	1	1	1	1	1	0	1	0	0
1	1	0	1	1	1	1	0	1	0	1	0
0	0	0	1	1	0	1	0	0	0	0	1
1	1	0	1	1	1	1	0	0	0	1	0
11	9	2	14	11	12	15	1	4	3	6	1
6	7	1	8	8	7	8	1	3	1	2	1

APPENDIX 1

3300	4000	4100	4200	4201	4300	4400	5000	5001	5002	5003	5004
0	0	0	0	1	0	0	1	1	0	0	0
0	1	0	1	0	0	0	1	0	0	1	1
1	1	1	1	1	0	1	0	0	0	0	1
0	0	1	0	0	1	1	1	1	0	1	1
1	1	0	0	0	0	0	1	0	0	1	1
				1			1				1
1			1			1	1			1	1
1	1	1	0	0	0	1	1	0	0	0	1
0	0	0	0	0	1	0	1	1	1	1	1
4	4	3	3	3	2	4	8	3	1	5	8
1	0	0	0	0	1	0	1	1	1	0	1
1	1	1	1	0	1	0	1	0	0	0	1
1	1	1	1	0	0	1	0	0	0	1	0
1	1	1	1	0	0	0	1	1	0	0	1
1	1	1	0	0	0	0	1	0	0	0	1
0	1	0	1	0	0	0	1	0	0	0	1
0	1	1	0	0	0	1	1	0	0	1	1
1	1	1	1	0	0	1	1	0	0	0	0
10	10	9	7	3	4	7	14	5	2	6	13
6	7	6	5	0	2	3	7	2	1	2	6

APPENDIX 1

5005	6000	6100	6101	6200	6201	6202	6203	6300	7000	7100	7101
0	0	1	0	1	0	0	0	0	0	1	0
1	0	0	0	0	0	1	0	0	1	1	1
0	0	1	0	0	0	0	1	0	0	0	0
0	1	0	0	0	0	1	0	0	1	1	1
0	1	0	0	0	0	1	0	0	0	1	1
	1			1		1			1	1	
	1	1				1		1	1	1	1
0	1	1	0	1	0	0	1	0	0	0	0
1	1	1	1	1	0	0	0	0	1	0	0
2	6	5	1	4	0	5	2	1	5	6	4
0	1	1	0	1	0	0	1	0	1	0	0
0	1	1	1	1	1	0	0	0	1	1	1
1	0	1	0	0	1	0	0	0	1	1	1
1	1	0	0	1	0	0	0	0	1	1	1
0	0	0	0	1	1	0	0	0	1	1	1
0	1	1	1	1	1	0	1	1	1	1	1
0	1	1	1	0	0	0	0	1	1	1	1
0	1	1	1	1	0	1	0	0	1	1	1
3	12	11	5	10	4	5	4	3	12	12	10
2	6	6	4	6	4	1	2	2	8	7	7

APPENDIX 1

7102	7103	7200	7201	7202	7203	7204	7205	7206	7207	7300	7301
0	0	0	1	0	0	0	0	0	0	0	0
1	0	1	0	0	1	0	1	0	0	0	0
1	0	1	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	0	1	0
0	0	1	0	0	0	1	0	0	0	1	1
							1		1	1	
			1				1			1	
0	0	1	0	0	1	0	0	0	0	1	1
1	0	0	1	0	1	1	1	1	1	1	0
3	0	5	3	0	3	2	4	1	2	6	3
1	0	0	0	0	1	0	1	0	0	1	0
1	1	1	0	1	1	1	0	1	1	1	1
1	1	1	0	0	0	0	1	0	0	1	1
1	1	1	1	0	1	0	1	1	1	1	1
1	1	1	0	0	1	0	1	0	1	1	1
1	0	0	0	0	1	1	1	0	1	0	1
0	1	1	0	1	1	0	0	1	0	1	1
1	1	1	0	0	0	0	1	0	0	1	0
9	6	10	4	2	8	4	9	4	6	13	9
7	6	6	1	2	6	2	6	3	4	7	6

APPENDIX 1

7302	7303	8000	8001	8002	8003	8004	8005	8006	8007	9000	9100
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0
1	0	0	0	1	0	0	0	0	0	1	1
1	0	0	0	0	0	0	0	0	0	0	1
1										1	1
1		1				1	1	1		1	1
1	0	1	0	0	1	0	0	0	1	0	0
1	0	0	0	1	0	0	1	0	0	1	1
7	0	3	0	2	1	1	3	2	2	4	5
1	0	0	0	0	0	1	0	0	0	1	1
1	1	0	0	0	0	0	0	0	0	1	1
1	1	1	0	1	0	1	0	0	0	1	1
0	0	1	1	0	0	1	0	0	0	1	1
1	0	0	0	0	0	1	1	1	1	1	1
0	0	1	1	0	0	0	1	1	0	1	1
1	1	1	0	0	0	1	0	0	0	1	1
0	0	0	0	0	1	0	1	0	0	1	0
11	3	7	2	3	2	6	5	4	3	12	12
5	3	4	2	1	1	5	3	2	1	8	7

APPENDIX 1

9101	9102	9103	9104	9105	9106	9107	9108	9109	9110	9200	9201
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	1	0	0	1	1
1	0	0	0	0	0	0	0	0	1	1	1
0	0	1	0	1	0	0	0	0	1	0	0
1				1							
1						1	1		1		
1	0	0	0	0	0	0	0	0	0	0	1
1	1	0	0	1	1	1	1	0	0	0	1
5	1	1	0	3	1	2	3	0	4	2	4
0	0	0	0	1	0	1	0	0	0	0	1
1	0	0	0	1	1	0	1	1	1	0	1
1	0	1	1	1	1	1	0	1	1	0	1
1	1	1	0	1	1	0	0	0	1	1	1
1	0	0	0	1	1	0	0	0	0	1	1
1	0	1	0	1	0	0	0	1	1	0	1
0	1	0	1	1	1	0	0	0	1	0	0
0	0	1	0	1	1	0	0	0	1	0	0
10	3	5	2	11	7	4	4	3	9	4	10
5	2	4	2	8	6	2	1	3	6	2	6

APPENDIX 1

9202	9203	9204	9205	9206	9207	9208	9300	9301	9302	9303	9304
0	0	0	0	0	0	0	0	1	0	0	1
0	0	0	0	0	0	1	1	0	0	0	1
0	0	0	1	0	1	1	0	0	0	0	1
0	0	1	0	0	0	0	1	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
1							1				
		1				1	1				
0	1	0	0	0	1	0	1	0	0	1	1
0	1	1	0	0	1	0	1	0	1	0	0
1	2	3	1	0	3	3	6	2	1	1	4
0	0	0	0	0	1	1	1	0	0	0	0
1	1	1	1	0	1	1	1	0	0	0	0
0	0	0	1	0	0	1	1	0	0	0	0
0	1	1	0	1	0	1	1	0	0	1	1
1	1	1	1	1	1	0	1	1	0	0	0
1	1	1	1	1	1	1	1	0	0	0	0
0	0	0	0	0	1	0	1	0	0	1	0
0	0	0	0	0	0	0	1	0	1	0	0
4	6	7	5	3	8	7	13	3	2	3	4
3	4	4	4	3	5	5	8	1	1	2	1

APPENDIX 1

9305	9306	9400	9401	9402	9403	9404	9405	9406	10000	10100	10101
1	0	0	0	1	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0	0	1	1	1
0	1	1	1	1	0	0	0	0	1	1	0
1	1	1	1	1	1	1	0	0	1	1	0
0	0	1	0	1	0	1	1	0	1	1	0
		1	1	1		1		1	1		
		1				1					
0	0	1	0	0	0	1	0	0	1	1	0
1	0	1	1	1	0	0	0	0	1	1	0
4	2	8	4	7	1	6	1	1	7	6	1
1	0	1	1	1	0	0	0	0	1	1	0
1	1	1	0	1	0	1	1	1	1	1	0
1	1	1	0	1	1	0	1	0	1	1	0
0	1	1	1	1	0	1	1	0	1	1	0
1	1	1	0	1	0	1	0	0	1	0	1
1	1	1	0	1	0	0	1	0	1	1	1
0	1	1	0	1	0	1	0	0	1	1	1
1	0	1	0	1	1	1	1	1	1	1	1
9	8	15	6	14	3	10	6	3	14	12	4
6	6	8	2	8	2	5	5	2	8	7	4

APPENDIX 1

10102	10103	10104	10105	10200	10201	10202	10203	10204	10205	10300	10301
1	0	0	0	1	0	0	0	0	1	1	0
0	1	0	0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1	0	0
1	0	0	1	0	1	1	0	1	1	0	0
0	0	0	1	0	1	0	0	0	1	1	0
1			1						1		1
			1								
1	1	1	0	1	1	0	0	1	0	1	0
1	0	0	1	1	1	1	1	1	0	1	1
5	2	1	5	3	5	2	1	3	5	4	2
1	0	0	1	1	1	1	1	1	0	1	1
0	0	0	0	0	0	0	1	0	0	0	0
1	0	0	1	0	1	1	0	0	1	1	1
0	0	0	0	1	1	0	1	0	0	1	0
1	1	0	1	0	1	1	1	0	0	1	0
1	0	0	1	0	1	1	0	1	1	0	0
1	0	0	1	1	1	0	0	1	0	1	0
1	1	0	1	0	1	1	0	0	1	0	0
11	3	1	11	6	11	7	5	6	8	9	4
6	2	0	6	3	7	5	4	3	3	5	2

APPENDIX 1

10400	10401	10402	10403	10404	10405	10406	10407	10500	10501	10502	10503
0	1	0	0	0	0	0	0	1	1	0	1
1	1	0	0	1	0	1	1	1	0	0	0
1	0	0	0	1	0	1	1	1	0	0	0
1	0	0	0	0	0	0	1	1	0	1	0
0	0	0	0	1	0	0	1	1	0	0	0
				1		1	1				
	1			1		1	1	1			
1	1	1	0	1	1	1	1	1	0	0	0
1	1	1	1	1	0	0	1	1	1	1	1
5	5	2	1	7	1	5	8	8	2	2	2
1	0	1	0	1	1	0	1	1	1	0	0
0	0	0	0	1	1	0	0	1	0	0	1
1	1	0	0	1	1	1	1	1	0	1	1
0	1	0	0	1	1	1	1	1	0	0	1
1	0	0	0	1	1	1	0	1	0	0	1
1	1	0	0	1	0	1	0	1	0	0	1
1	1	1	0	1	1	1	1	1	0	0	1
1	1	0	0	1	0	1	1	1	0	0	1
10	9	4	1	14	7	10	12	15	3	3	9
6	5	2	0	8	6	6	5	8	1	1	7

APPENDIX 1

10504	10505	10506	11000	11100	11101	11200	11300	11301	11302	11400	11500
0	0	1	0	0	0	1	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	0	0	0	0	0	0	1	1
1	0	1	0	0	0	0	0	0	0	0	1
1				1			1				1
											1
0	0	1	0	0	1	0	1	0	1	0	1
1	1	1	0	0	0	0	0	0	0	0	1
5	2	4	0	1	1	1	2	0	1	1	8
1	1	1	0	0	0	1	0	1	0	1	1
1	1	0	0	0	0	1	0	0	0	1	1
0	0	1	0	0	0	0	0	0	0	0	1
1	1	0	1	0	0	0	1	1	0	0	1
1	1	1	1	0	0	1	0	0	0	0	1
1	1	1	0	0	0	1	1	1	1	0	1
1	1	1	1	0	0	0	0	0	0	1	1
0	1	0	0	0	0	0	0	0	0	0	1
10	8	9	3	1	1	5	4	3	2	4	15
6	7	5	3	0	0	4	2	3	1	3	8

APPENDIX 1

11501	11502	11503	11504	11505	11600	11601	11602	11603	12000	12100	12101
0	1	0	1	0	0	0	0	0	0	1	0
1	1	1	1	0	0	0	0	0	0	0	1
1	1	0	1	1	0	0	0	0	1	0	0
1	1	0	1	0	0	0	1	0	1	1	0
1	1	1	0	1	0	0	0	0	0	1	1
1									1		
	1	1	1	1					1		
1	1	0	1	1	0	0	0	0	1	1	0
1	1	0	1	0	0	0	0	0	1	1	0
7	8	3	7	4	0	0	1	0	6	5	2
1	0	0	1	0	0	0	0	0	1	0	0
1	1	0	1	0	0	0	0	0	1	0	0
1	1	1	1	0	0	0	0	0	0	0	0
1	1	0	1	1	0	0	0	0	0	1	0
1	1	1	0	0	0	0	0	0	1	0	0
1	1	1	1	1	0	0	0	0	1	1	0
1	1	1	1	0	0	0	0	0	1	1	0
1	1	1	1	0	0	0	0	0	1	0	0
14	14	7	13	6	0	0	1	0	12	8	1
8	7	5	7	2	0	0	0	0	6	3	0

APPENDIX 1

12200	12201	12202	12203	12300	12301	12302	12400	12401	12402	12403	12404
0	1	0	1	1	0	0	0	0	0	0	0
0	0	0	0	1	0	0	1	1	1	0	0
1	0	1	0	0	0	0	0	1	1	1	0
0	0	0	0	1	0	0	0	1	1	1	1
1	0	0	0	0	0	0	1	0	0	0	1
1									1		1
	1						1	1	1	1	
1	1	1	1	1	0	0	1	0	1	1	0
1	1	0	1	1	0	0	0	0	1	1	0
5	4	2	3	5	0	0	4	4	7	5	3
1	1	1	1	1	0	0	1	0	1	1	1
1	0	1	1	1	0	0	1	1	1	1	0
1	0	0	0	1	0	0	1	1	1	0	0
1	0	0	0	0	0	0	1	1	0	1	0
1	0	0	0	1	0	0	1	1	1	1	1
1	0	1	1	0	0	0	1	1	1	1	1
0	1	1	1	1	0	0	1	1	1	0	1
0	1	0	0	1	1	0	1	0	1	0	1
11	7	6	7	10	1	0	11	9	13	10	8
6	3	4	4	6	1	0	8	6	7	5	5

APPENDIX 1

12500	12501	12502	12503	12600	12601
1	0	0	0	0	0
1	0	0	1	0	1
1	0	1	1	0	0
0	0	0	0	0	1
1	0	1	0	0	1
				1	
1	1	0	1	0	0
0	0	0	0	0	1
5	1	2	3	1	4
0	0	0	0	0	0
0	0	0	0	0	0
1	0	0	0	0	0
0	0	0	0	0	1
0	0	0	1	1	0
1	0	0	1	1	1
1	1	0	1	0	0
0	0	0	0	0	0
7	2	2	5	3	5
3	1	0	3	2	2

M	=	9					
N	=	1	L	=	1	FLMN =	.1111111
N	=	1	L	=	2	FLMN =	.2222222
N	=	1	L	=	3	FLMN =	.3333333
N	=	1	L	=	4	FLMN =	.4444444
N	=	1	L	=	5	FLMN =	.5555556
N	=	1	L	=	6	FLMN =	.6666667
N	=	1	L	=	7	FLMN =	.7777778
N	=	1	L	=	8	FLMN =	.8888889
N	=	2	L	=	1	FLMN =	.2222222
N	=	2	L	=	2	FLMN =	.4166667
N	=	2	L	=	3	FLMN =	.5833333
N	=	2	L	=	4	FLMN =	.7222222
N	=	2	L	=	5	FLMN =	.8333333
N	=	2	L	=	6	FLMN =	.9166667
N	=	2	L	=	7	FLMN =	.9722222
N	=	3	L	=	1	FLMN =	.3333333
N	=	3	L	=	2	FLMN =	.5833333
N	=	3	L	=	3	FLMN =	.7619048
N	=	3	L	=	4	FLMN =	.8809524
N	=	3	L	=	5	FLMN =	.952381
N	=	3	L	=	6	FLMN =	.9880952
N	=	4	L	=	1	FLMN =	.4444444
N	=	4	L	=	2	FLMN =	.7222222
N	=	4	L	=	3	FLMN =	.8809524
N	=	4	L	=	4	FLMN =	.9603174
N	=	4	L	=	5	FLMN =	.9920635
N	=	5	L	=	1	FLMN =	.5555556
N	=	5	L	=	2	FLMN =	.8333333
N	=	5	L	=	3	FLMN =	.952381
N	=	5	L	=	4	FLMN =	.9920635
N	=	6	L	=	1	FLMN =	.6666667
N	=	6	L	=	2	FLMN =	.9166667
N	=	6	L	=	3	FLMN =	.9880952
N	=	7	L	=	1	FLMN =	.7777778
N	=	7	L	=	2	FLMN =	.9722222
N	=	8	L	=	1	FLMN =	.8888889

One on One Interview Factorial Data

Exhibit 2

```
M =  8
N =  1  L =  1  FLMN =  .125
N =  1  L =  2  FLMN =  .25
N =  1  L =  3  FLMN =  .375
N =  1  L =  4  FLMN =  .5
N =  1  L =  5  FLMN =  .625
N =  1  L =  6  FLMN =  .75
N =  1  L =  7  FLMN =  .875
N =  2  L =  1  FLMN =  .25
N =  2  L =  2  FLMN =  .4642857
N =  2  L =  3  FLMN =  .6428571
N =  2  L =  4  FLMN =  .7857143
N =  2  L =  5  FLMN =  .8928571
N =  2  L =  6  FLMN =  .9642857
N =  3  L =  1  FLMN =  .375
N =  3  L =  2  FLMN =  .6428571
N =  3  L =  3  FLMN =  .8214286
N =  3  L =  4  FLMN =  .9285714
N =  3  L =  5  FLMN =  .9821429
N =  4  L =  1  FLMN =  .5
N =  4  L =  2  FLMN =  .7857143
N =  4  L =  3  FLMN =  .9285714
N =  4  L =  4  FLMN =  .9857143
N =  5  L =  1  FLMN =  .625
N =  5  L =  2  FLMN =  .8928571
N =  5  L =  3  FLMN =  .9821429
N =  6  L =  1  FLMN =  .75
N =  6  L =  2  FLMN =  .9642857
N =  7  L =  1  FLMN =  .875
```

Focus Group Factorial Data

Exhibit 3

Appendix 4: Results for the Total Cumulative Beta-binomial

Customer Number	Cumulative Beta-Binomial
1	0.59
2	0.7
3	0.78
4	0.82
5	0.86
6	0.88
7	0.9
8	0.916
9	0.928
10	0.937
11	0.945
12	0.951
13	0.956
14	0.96
15	0.964
16	0.967
17	0.97
18	0.973
19	0.975
20	0.977
21	0.978
22	0.98
23	0.981
24	0.982
25	0.983
26	0.984
27	0.985
28	0.986
29	0.987
30	0.988