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Alisa R. Doan, Edgar Chambers

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Predicting success for new flavors with information known pre-launch: a flavored snack food case study

Alisa R. Doan, Edgar Chambers IV

Sensory Analysis Center, Department of Human Nutrition, Kansas State University, 145 Justin Hall, Manhattan, Kansas 66506, USA.

Corresponding author: Edgar Chambers IV

Phone: 785-532-0156

Fax: 785-532-0176

Email: eciv@ksu.edu

Address: 143 Justin Hall, Manhattan, KS 66506

12 **Abstract**

13   Success in the marketplace is the goal of every product launch. Knowing what data to

14 collect before launching a product that could predict success would be valuable to companies.

15 Thus, the objective of this study was to determine whether success of new line extensions for a

16 multi-flavored snack product available internationally could be predicted from information

17 available before launch. Staff from 15 countries completed a questionnaire for each product and

18 included questions related to authenticity, familiarity, and capturing current trends, packaging

19 and market place issues such as product competition and pricing. Using 63 flavors, a

20 discriminant function correctly identified 75.8% successful products as successful and 66.7%

21 unsuccessful products as unsuccessful. Stepwise comparison determined the variables necessary

22 to correctly categorize the snack products: being a trendy flavor, new to the category, based off

23 foods from restaurants or traditional foods. These variables assisted in predicting in market

24 success for this product category.

25

26 **Keywords:** success, discriminant analysis, product development, stepwise regression

Introduction

Predicting success in the market, prior to a launch is difficult. Designing a strategy to allow continuous introduction of new products into the marketplace before competitors will increase the chance of success (Fortuin, Batterink and Omta, 2007). New products can come from different paths to the marketplace including new concepts, new raw materials, line extensions, reviving old products and targeting a new audience (Hanchate, 2006). As these new products are created, the decision making processes in the innovation phase are used to help ensure that the product is headed towards a successful launch (Vatthanakul, Jangchud, Jangchud, Therdthai and Wilkinson, 2010; Jones and Jew, 2007). These processes include working in cross-functional teams with other areas contributing to the development of the product (Wilson, 1994), creating as many different innovative ideas as possible (Jones *et al.* 2007), conducting comprehensive market assessment and determining what the consumer wants (Bogue, Seymour and Sorenson, 2006).

When completing a comprehensive market assessment it is critical to evaluate 10 factors to define the definition of the product and improve the chance of success. Wilson (1989, p 14) identified these factors as: "*strategic alignment, customer need, competitive analysis, compliances, product positioning, select project priorities, identify technical and process risks, identify appropriate market channels, management leadership, and human and financial resources.*" For Hewlett-Packard (HP) if any of these portions were skipped, they found projects fell short of projections and failed in the marketplace. However, when the cross-functional teams worked together and these factors were considered and agreed upon, HP saw more organized launches (Wilson, 1994).

49   As product ideas are developed and continue into the product development life cycle it is

50   necessary that all preliminary information from the consumer marketplace be collected. Starting

51   the product development phase without gathering knowledge of what needs the product must

52   satisfy will not lead to a project focused on success (Buisson, 1995). The biggest challenge is

53   the tedious job of collecting all necessary information from the consumer marketplace and

54   knowing which requirements are the most critical to consumers for success. Because consumer

55   needs often change slowly it is possible to collect the necessary information from the consumer

56   and then only update or confirm the information previously collected (Krieg, 2004).

57   Predicting whether or not a product will be successful in the marketplace is determined

58   based on calculating risk (Penn State, 2007). These risks include timing of launch, product price,

59   competitors, marketing support (Chomka, 2003), focus on consumers wants and needs (Ottesen

60   and Grønhaug, 2005) and adaptability to market changes. Creating flavor fusions in new

61   markets using export opportunities requires adaptability since the ethnic flavors may be familiar

62   and acceptable in the country it was developed in but may be unfamiliar to the new target

63   country. In order to increase the chance of success it is important to learn about acceptable

64   variables by product testing and looking at the product as part of the new country's daily life

65   (Tuorila, Andersson, Martikainen and Salovaara, 1998).

66   Timing of launch is also important to consider in order to reduce risk of failure. If an

67   appropriate time/season does exist for the product (e.g. launch of white chocolate and cinnamon

68   flavors at Christmas time coinciding with a movie release, Watson, 2003), then launching the

69   product at that time will increase consumer awareness of the product (Wilson and Norton, 1989).

70   Product pricing also is critical for success. Sometimes new products are priced higher or

71   promoted as premium products in order to pay for the innovations used to create the product.

72 Other times, companies will take a decrease in profit short-term to maintain a more reasonable

73 price to encourage first time buyers to try the product (Rajagopal, 2008).

74   Many studies have evaluated critical product attributes for consumers through various

75 procedures (see e.g. Chung et al., 2011; Parente, Manzoni and Ares, 2011; Chrea et al., 2011,

76 and Lee et al., 2010). Although it is known that keeping the end-user in mind will require

77 staying in touch with the consumer through the whole project, it is sometimes difficult to do this,

78 especially if there is not funding to support such extensive testing (Harmsen, Grunert and

79 Declerck, 2000). If this is the case, looking at previously collected data or information that could

80 be known prior to launch of the product could lead to enhanced decision making. The objective

81 of this study was to determine whether success could be predicted from information available

82 before launch.

83 **Materials and Methods**

84   An international food manufacturer was contacted and agreed to provide information for

85 this study. The study was conducted using a flavored snack food available in many international

86 markets. Conversations with product development and marketing teams in the company

87 generated various options for market and product selection. Ultimately, a flavored snack food

88 product made from a similar base product was selected because it is widely available in many

89 international markets on all continents. Additional discussions related to market selection

90 consisted of factors such as product development activities for the country (an active product

91 development program for the country was needed), whether information would be readily

92 available (e.g., markets with major recent staff turnover were excluded because new staff might

93 be unable to provide some answers on past products), and market breadth (a wide range of

94 countries was desired).

95 <u>Countries and Products</u>

96   For the study 15 countries provided a list of successful and unsuccessful flavors launched

97 in the past 5 years. Countries contacted were: Argentina, Australia, Brazil, China, Egypt, India,

98 Mexico, Poland, Russia, Spain, South Africa, Thailand, Turkey, United Kingdom (UK) and the

99 United States (US). Initial data was requested on three successful and three unsuccessful flavors

100 from each of the countries, some countries responded with more products than were requested

101 while other responded with less. Each flavor was identified and classified by the country as

102 either successful, having been in the market longer than 1 year, or unsuccessful, having been

103 removed from the market in less than 1 year. To be included in the study, each product had to

104 have met initial liking hurdles set by the international company, with local input, for launch. The

105 products each country selected were to include only problems perceived as product related rather

106 than ones the company felt were unsuccessful because of in-market launch execution problems.

107 For example, products introduced with minimal marketing or promotional support after launch

108 products introduced with poor market timing, or seasonal products that were intentially

109 introduced only for a short time. Initial questions were asked to assure that all products were

110 accurately chosen:

111   • Was this product successful or unsuccessful?
112   • Was the introduction and marketing of this product executed well?
113   • Where there any cost issues affecting the product (e.g. premium pricing)?
114   • Was the product released with appropriate after-market support?

115   Any product that was not introduced well into the market area, had cost issues or did not

116 have appropriate market support were excluded from the study because the intent was to focus

117 on product characteristics that were known before launch that could help determine longer-term

118 (i.e., more than 1 year) success. There were 63 products that were selected for further evaluation

119 on the full questionnaire.

120   Questionnaire Development

121   A questionnaire was developed to collect as much information as possible about the

122   products that were launched into the marketplace. Figure 1 shows the questionnaire that was to

123   be completed on each of the products in the study. It included multiple choice questions, as well

124   as, yes/no and 5-point scales to collect information on the products.

125   In order to assure that data was collected on market (e.g., in-market sales and competitive

126   situation), product (e.g., liking, aftertaste and authenticity) and concept (e.g., purchase interest)

127   data, additional information was needed aside from the questionnaire. Since each product was

128   launched into the marketplace prior to the testing, actual data was collected on the performance

129   in the marketplace. These are the categories that market data was collected on:

130   • Product summary (SKU, target consumers, etc.)
131   • Time of launch and location
132   • Product concept fit
133   • Label information
134   • Percent share
135   • Trial and repeat
136   • Distribution
137   • Consumer testing

138   After developing the questionnaire it was distributed to product developers and/or flavor

139   scientists in each country to gather the requested information. Some of the questions were easily

140   answered by the product developer/flavor scientist, but others required assistance from other

141   departments within the company (e.g., marketing research). All questions were to be answered

142   in order to collect as much information as possible to be used for the data analysis.

143   For each of the successful/unsuccessful products, a questionnaire was sent to the contact

144   in each country by email in a word document. Countries then sent back the questionnaires for

145   each of the products as well as an excel file with the additional data information requested. Most

146   data was collected via email, but additional information was obtained by phone calls when

147 necessary. Extensive follow-up ensured as much data as possible was collected. Three countries

148 were unable to fully complete the questionnaires: Argentina, India and the US.

149 Data Analysis

150   Data from all countries were combined into a single data file. Scaled questions remained

151 as numbers and categorical questions were changed into 0/1 dummy variables. For example, a

152 yes/no question received a 0 for no and a 1 for yes. A question with four multiple choice

153 answers was converted to four dummy variables responses with one of the four responses

154 receiving an 1 and the other three answers receiving a 0. A stepwise discriminant analysis

155 (PROC STEPDISC in SAS® 9.2, Cary, NC, USA) was used to determine specific questions that

156 best classified the data into the successful and unsuccessful categories. Wilks' Lambda

157 multivariate test was used to determine significant differences between variables. The PROC

158 DISCRIM function then was used to give a classification table of correct and incorrect estimates

159 of the data into the two groups.

160   The discriminate function was first performed on all data collected on the products,

161 including data known pre- and post-launch., to determine the ability of the function to predict

162 success. A second discriminate function was calculated using only the information that would

163 have been known prior to or during the early stages of product development.   For example, is

164 the product, a) new to the overall product category, b) a new variation in the category, c) a new

165 variation to the country, d) a familiar flavor, e) whether the flavor appears "authentic" to the

166 culture, f) based on a traditional dish, g) a dish found in most restaurants, h) a trendy flavor

167 (following an in-market trend flavor), i) promoting a 'healthy' concept, or j) being made with

168 problem ingredients.

169 **Results and Discussion**

170   <u>Data Gathering</u>

171   One difficulty in conducting this type of study is gathering the data and the determining

172   the impact that informationcan have on overall information. Data was gathered from the global

173   company's corporate headquarters and emails were sent to contact persons in each country

174   requesting them to return the information within one month. Only three countries responded

175   within the requested amount of time with complete data. Reminder emails, multiple telephone

176   calls, and corporate assistance in requestin information ultimately was necessary to get most of

177   the information.   In total the time frame for gathering the data was approximately six months.

178   Of the 15 original countries selected, two of the countries did not provide enough information to

179   be included in the analysis, and one country did not provide any information that was requested.

180   Thus from the original set of 102 products from 15 countries data gathered from the 12

181   responding countries resulted in a total of 63 products with adequate information.

182   <u>Internal Validation of the Information Gathered</u>

183   When looking at all data collected the discriminant analysis estimated 100% of the

184   successful products as successful and 90% of the unsuccessful products as unsuccessful (Table

185   1). Thus, using information available both before and immediately after launch this study was

186   able to almost completely predict success or failure. This analysis serves as an internal

187   validation that the information collected was useful and could predict success in future studies.

188   Of course, using all data collected would not help predict success prior to a launch because the

189   product would need to be in the marketplace to collect some of the information.

190   <u>Predicting Success with Information Known Pre-Launch</u>

191   When limiting the collected information to the questions where information could be known

192   prior to launch the discriminant analysis estimated 75.8% of the successful flavored snack

193   products as successful and 66.7% of the unsuccessful products as unsuccessful (Table 2).

194   This prediction was found after the stepwise regression procedure reduced the 13 original

195   variables to four significant pieces of information that could make the data more easily

196   interpreted: 1) flavors new to snacks category in the country, 2) trendy, 3) traditional flavors and

197   4) flavors found in restaurants (Table 3).

198   It is important to recognize that some of the significant variables have a positive impact on

199   success and others a negative impact. In general, products that were successful were not new

200   flavors to the general snack food category. However, successful products could and often were

201   traditional or currently trendy flavors commonly found in restaurants. These findings suggest

202   that creating an entirely new flavor category within a product category can be a difficult task.

203   However, sometimes new products are ocused on a segment of the population (e.g.., specific

204   ethnic groups or diabetics) or may be flavor fusions (i.e. the restaurant connection) of products

205   from other countries (Kühne, Vanhonacker, Gellynck and Verbeke, 2010; Watson, 2003)

206   creating success in a smaller group that can expand into the larger population. Taking a

207   successful product of one country and developing it to be acceptabile in another country,

208   unfamiliar to that flavor, can create opportunities for new food flavors (Tuorila *et al*. 1998).

209   However,success using this approach may require substantially more market support.

210   New successful products were sometimes based on food that is traditional, has been around

211   in the country a long time, or is a trendy concept or idea. Traditional flavors can sometimes

212   catch the attention of an interested consumer and create impulse purchasing, then repeat purchase

213   (Jones *et al*. 2007; Watson, 2003). Trendy flavors tag onto current market trends (e.g., health)

214   often generating trial purchases, and when well executed can become staple flavors over time.

215   When a trendy flavor is matched with quality ingredients and carefully developed it can become

216   the right flavor at the right time (Anon, 1999). The interest that customers have for a trendy

217   flavor can stimulate the product in the market and create success (Bartels and Reinders, 2010;

218   Rajagopal, 2008; Sheldrake, 2008). However, trendy flavors also can be difficult because

219   "trends" are often fads that change rapidly and make it difficult to stay at the marketplace top

220   (Fortuin *et al*. 2007).

221   **Conclusions**

222   Predicting successful and unsuccessful products is key to achieving better success rates

223   for new product. Collecting as much information as possible prior to launch can help make a

224   better prediction. This information includes collecting data even before the product is developed

225   (i.e., whether the flavor is new to the overall category, a new variation in the category, based on

226   a dish found in most restaurants, a trendy flavor, promote 'healthy' concepts, etc.). The process

227   of collecting this information is not easy, and it requires patience and considerable

228   communication between researchers and departments with the needed information. However,

229   based on this case study coordinating analysis of such knowledge may be able to guide future

230   projects to successful fruition.

231   For flavored snack products (using only limited general information available to the

232   product developers) success rates of approximately 70% could be predicted. For this product

233   category, being a completely new flavor for the market generally predicted failure, but being

234   traditional, trendy, or a flavor commonly found in restaurants within a country often predicted

235   success. Considering half the products (50%) used in this study were unsuccessful, that data

236   improves the potential prediction of success from 50 to approximately ~70%, a major increase.

237   Using prior known information is potentially an easy way to increase the likelihood for success.

238   It is possible that additional specific information on the products (i.e., the specific sensory

239   characteristics of products) could improve that equation further, but such information was not

240   available in most countries. These questions worked well for the flavored snack products

241   category but may not be the exact same questions needed for another category. This research

242   identified a procedure including the kinds of questions that can be used to obtain successful

243   prediction in a category.

244
245

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337   **Tables**

338

339 TABLE 1. DISCRIMINANT TABLE FOR PERCENTAGE OF SUCCESSFUL AND
340 UNSUCCESSFUL FLAVORS CLASSIFIED USING ALL RESPONSES FROM THE
341 QUESTIONNAIRE.

	Unsuccessful	Successful
Unsuccessful	90.0%	10.0%
Successful	0.0%	100.0%

342

343

344 TABLE 2. DISCRIMINANT TABLE FOR PERCENT OF SUCCESSFUL AND
345 UNSUCCESSFUL FLAVORS CLASSIFIED USING INFORMATION KNOWN PRIOR TO
346 LAUNCH.

	Unsuccessful	Successful
Unsuccessful	66.67%	33.33%
Successful	24.24%	75.76%

347

348
349 TABLE 3. IMPACT ON PREDICTION OF SUCCESS FOR SNACK FOOD FLAVORS
350 BASED ON DISCRIMINANT ANALYSIS FUNCTION
351

Variables	Impact on Prediction
New to product category	NE
New to salty category	NE
New to snack foods	Negative
Nothing like it on the market	NE
Familiarity	NE
New flavor dish to the country	NE
Regional flavor dish to the country	NE
Common flavor in Restaurants	Positive
Traditional flavor that has been around a while	Positive
Trendy flavor	Positive
Problem ingredients on the label	NE
Promoting a 'healthy' concept	NE

NE=No Effect

352

353 TABLE 4. WILKS' LAMBDA TEST FOR SIGNIFICANT VARIABLES FOR ATTRIBUTES
354 FROM STEPWISE REGRESSION

Variables*	Wilks' Lambda	P-value
New to snacks	0.92	0.03
Trendy	0.87	0.02
Traditional to country	0.78	0.00
Found in restaurants	0.73	0.00

*Table only shows variables that were significant at $P \geq 0.05$.

355

356

357   **Figures**

358

359   Figure 1: Questionnaire Distributed to Obtain More Product Information

360