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Chapter 1
DiGiorno Pizza: Introducing a Frozen Pizza to Compete with Carry-Out

In conducting research for the launching of a new product it is imperative that the target population be identified. In this case, who are the people most likely to be interested in purchasing and consuming frozen pizzas in lieu of carry-out pizzas? How are these people to be identified for sampling (Chapter 7 refers to this group as the "frame")? Should a test market city or area be used? Why or why not? What mode of survey such as telephone, mail, or personal interview should be used? When should these people be surveyed? Does time of day, day of the week, or season of the year make any difference? What types of measurements should be taken? Some possible measurements might include dollar amounts spent per week of pizza per family, number of pizzas purchased per month, percentage of family pizza consumption that is frozen pizza, and total amount spent per month on take-out food.

1. One population that was identified was "pizza lovers". These people may have been previously identified by market researchers based on number of pizzas purchased per month, use of coupons, or from previous surveys. Another population mentioned in the case was women ages 25 to 54. The advertisements shown on national TV were likely aimed at the general population because Kraft was attempting to achieve broader goals such as brand name recognition and a dissemination of the "fresh-baked taste" message.

   In each of the research efforts, the market research company selected only a sample of the population. SMI-Alcott sent out 1,000 surveys to pizza lovers, the Loran Marketing Group conducted focus groups (which usually have no more than 15 people per group) with women 25 to 54, and Product Dynamics used focus groups to conduct blind taste tests.

   The market research companies (SMI-Alcott, the Loran Marketing Group, and Product Dynamics), took various measurements on sample members and from these measurements likely computed statistics. Some of these measurements may have included the ranking of various frozen pizza brands based on taste or status, numerical ratings of various types of pizza in terms of taste (perhaps, for example, on a scale from 1 to 7), amount of time sample members are willing to spend cooking a pizza, amount of money spent per month on pizzas, and percentage of sample who recognize the DiGiorno name. Using these measurements, sample statistics such as average amount of money spent per month on pizzas per family or proportion of the sample that recognized the DiGiorno name can be computed. From these sample statistics, population parameters can be estimated such as the percentage of all adults in the country who recognize the DiGiorno name; and the average amount a family spends on take-out pizza per month?

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This is a good place to introduce the estimation concepts of Chapter 8 intuitively. One can discuss point estimates (sample statistics) and the notion of sampling error.

Kraft likely used known descriptive market statistics in their product decision making such as total annual amount of dollars spent in the U.S. on frozen pizza; population demographics of the U.S. including age, number and size of households, average household income; and number of competitors in the frozen pizza market.

2. a. Number of pizzas consumed per week per household	ratio level
b. Age of pizza purchaser	ratio level
c. Zip code of the respondent	nominal level
d. Dollars spent per month on pizza per person	ratio level
e. Time between purchases of pizza	ratio level
f. Rating of taste of four pizza brands	ordinal level
g. Ranking of four brands	ordinal level
h. Geographic location	nominal level
i. Quality rating as excellent, good, average, etc.	ordinal level
j. Identification number of pizza brand	nominal level
k. Sex of survey respondent	nominal level

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Answers to Analyzing the Databases Questions in Chapter 1

Problem 1:

a. Ratio – The numbers contain equal intervals and the ratio of two numbers is meaningful. A company with 70 production workers has one-third as many production workers as a company with 210 production workers. The zero value in the dataset represents the absence of workers. Values less than zero are not possible.

b. Ratio – The cost of materials is a dollar value with equal intervals and the ratio of two cost of materials values is meaningful. A cost of materials value of 30000 is twice as much as a cost of materials value of 15000. Zero dollars represents the absence of value. Amounts less than zero are not possible.

c. Ordinal – There is a hierarchy to the numbers 1 through 4, but the intervals represented are not equal. A company with a number 3 for value of industry shipments is higher in this category than a company with a number of 1 for this same variable; however it is not three times higher. Similarly, a company with a number of 1 for value of industry shipments is not half as good in this category as a company with a number of 2 for this same variable.

d. Nominal – The numbers 1 through 20 merely represent different categories of sub-industries. A company with a 20 is not higher or lower than a company 15, or 10, or 1.

Problem 2:

a. Nominal – The numbers 1 through 7 merely represent different parts of the country. The value of 5 is not lower or higher than the value of 2 or 6.

b. Nominal – The numbers 1 through 4 merely represent each of four categories of type of ownership. The value of 4 is not higher or lower than the value of 1, 2, or 3.

c. Ratio – The numbers representing how many beds are in a hospital contain equal intervals and the ratio of two values is meaningful. A hospital with 100 beds is a quarter of the size of a hospital with 400 beds. The value of zero represents the absence of hospital beds. Values less than zero are not possible.

d. Ratio – The number of personnel associated with a hospital contain equal intervals

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and the ratio between two values is meaningful. A hospital with 131 employees has half as many employees as a hospital with 262 personnel. The value of zero represents the absence of personnel. Values less than zero are not possible.

Problem 3:

a. Nominal – The numbers 1 through 7 merely represent the type of industry. A number of 1 is not higher or lower than a value of 2 or 3.

b. Ratio – The numbers representing total assets contain equal intervals and ratios of two values is meaningful. A total asset value of 5000 is half as much as a total asset value of 2500. Values of zero represent the absence of assets. Values less than zero are not possible.

c. Ratio – A common definition of the P/E ratio is the ratio of the price per share of stock to the annual earnings per share the stock – although there are variations on this definition These ratios contain equal intervals and the ratio of P/E ratios is meaningful. For example, a P/E ratio of 2 is twice as high as a P/E/ ratio of 1. A P/E ratio of zero is the absence of a ratio; that is, zero is the smallest possible value for the P/E ratio. Values less than zero are not possible.

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