

A Customer Analysis of a Self-Service Garden Center

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INTRODUCTION

Cash receipts from nursery production in the United States in 1964 totaled more than \$240 million.¹ Ohio accounted for 5 percent of this total or almost \$12 million and Franklin County accounted for more than \$368,000.²

The nature of both production and sales of nursery stock has been changing rapidly in recent years. The rapid increase in residential construction, along with the movement to the suburbs which has developed, has produced a rapid expansion in sales of nursery stock and landscape plants. *Garden centers* have evolved as means of retailing nursery and other plants and supplies needed for lawn care. These outlets offer personal service and assistance in selecting plant material. Most of them also offer many other services such as landscaping advice and service, delivery, and often maintenance of plantings.

Early garden store outlets handled only plants and perhaps a very few related supplies, such as fertilizers and insecticides. Later they expanded into more complete garden centers, with merchandise including all kinds of garden supplies, tools, equipment, house plants, Christmas decorations, etc., in keeping with the "one stop shopping" concept and in an attempt to level off the seasonality of the business. These garden centers continued to function under a full service, high markup policy.

Originally plants were sold only "bare-root." In bare-root sales, the plants are pulled or dug from the ground and all soil is shaken from the roots before they are sold. This method allows the moving of plants only when they are dormant.

Later, many garden centers began to sell plants "balled and burlapped." These plants are dug with a ball of soil clinging to the roots and tightly wrapped with burlap to hold the soil in place. This method involves much more labor than the bare-root method but allows

¹U. S. Dept. of Commerce, Bureau of Census. 1964 United States Census of Agriculture, Preliminary Report, Series AC 64-P 1, p. 6.

²U. S. Dept. of Commerce, Bureau of Census. 1964 United States Census of Agriculture, Vol. 1, Part 10, Ohio, pp. 23, 419.

plants to be moved which would not survive if moved bare-root (i.e., most evergreens).

A more recent method of growing and selling has been the use of "container stock." To intensify production where land values are high and to reduce labor costs for harvesting or digging, plants are grown and sold in various types of plastic, metal, or wood cans or pots. Container stock can be sold and moved at almost any time of year with proper care. Some containers provide a much more attractive sales package than balled and burlapped plants.

Many garden centers today sell plants by each of the three methods at different times during the year.

Recently a new type of retail outlet for ornamental plants, the self-service garden center, has appeared. This type of outlet operates under the original supermarket concept of limited service, high volume, and low prices, but with proper display facilities and care for the plants being merchandised. A definite trend towards do-it-yourself planting of nursery stock by home owners reported in at least one study favors the growth of do-it-yourself retailing.³

BACKGROUND AND PURPOSE OF STUDY

This is a case study of the demographic characteristics, shopping habits, and attitudes of the customer population of one self-service garden center. The results of this analysis should be of interest to other retail nurseries and to a lesser extent to producers.

The individual garden center operator is interested in what he can do to attract more customers and in ways he can reduce costs without losing customers. A knowledge of the shopping habits and attitudes of the customer population will aid management in shaping advertising, promotional, and sales policies.

Although the findings from this study apply principally to the customers attracted to the one garden center, important generalizations can be drawn which apply to the industry as a whole. Both producers and retailers are interested in whether or not this retailing concept expands total nursery sales, either by attracting new purchasers or by increasing sales to old purchasers.

The objectives of this study are:

- To determine the relative importance to the customers of this garden center of some of the services and policies traditionally offered by garden centers.
- To determine the reasons consumers gave for visiting this particular garden center.

³Metz, Joseph F., Jr. and H. Royce Gully. 1959. Retailing Nursery Products. Cornell Univ. Agri. Exp. Sta., Ithaca, N. Y., A.E. 22.

- To describe and analyze various demographic characteristics of the customer population of this garden center which might affect advertising and promotional policies.

Sample Size and Method of Sampling

The sampling was made at a single garden center during a 2-week period in April 1967. Interviews were made throughout the day on Monday, Wednesday, Friday, Saturday, and on the following Friday. An attempt was made to keep the ratio of persons interviewed to total customers approximately equal for the weekday group and for the Friday-Saturday group.⁴

It was not actually possible, however, to comply fully with the above sampling procedure because: 1) while there were never more than two researchers interviewing customers, there were sometimes four lines of customers being checked out of the store at one time; and 2) there was a physical limitation of available space where the customers could fill out the questionnaire. Therefore, during the peak hours a smaller proportion of available customers was interviewed.

The customers were approached immediately after being checked out and, after a brief introductory comment, were asked to fill out a questionnaire. If they agreed to do so, two questions (numbers 5 and 10) which were found to be slightly confusing on the pretest of the questionnaire were further explained. When a person refused, the next customer in line was asked. As an incentive to fill out the questionnaire, a chance on a small prize was offered to all respondents.

Through the introductory statement by the researcher, the heading of the questionnaire, the name tag on the researcher, and signs placed in the area, a conscious attempt was made to keep the respondent from thinking that the survey was being made by the store manager or owner.

A total of 507 usable questionnaires were collected. Approximately 14 percent of the customers refused to complete a questionnaire and another 10 percent failed to complete the entire questionnaire.

Factor Analysis

Factor analysis was used in this study to reduce and simplify 21 variables, indices, or motivational statements relating to garden center selection. This technique has been used for nearly 50 years, especially in the field of performance psychology.⁵ Thurston and others have used it with interval scales to handle a large number of variables.⁶

⁴A customer is defined for this study as one shopping unit. Thus a family is considered to be one customer for enumeration purposes.

⁵Wolf, D. 1940. Factor Analysis to 1940. Psychometric Monograph No. 3.

⁶Blalock, Hubert M. 1960. Social Statistics. McGraw-Hill Book Co., Inc., New York p. 386.

TABLE 1.—Family Incomes of Sample.

Range	Number	Percent	Inversely Cumulative Percent
\$5000 or less	12	2.4	98.2
\$5001-\$7500	37	7.3	95.8
\$7501-\$10,000	76	15.0	88.5
\$10,001-\$12,500	110	21.7	73.5
\$12,501-\$15,000	101	19.9	51.8
\$15,001-\$17,500	60	11.8	31.9
\$17,501-\$20,000	34	6.7	20.1
More than \$20,000	68	13.4	13.4
No answer	9	1.8	—
Total	507	100.0	—
Median*	\$12,847		

*Estimated.

POPULATION CHARACTERISTICS AND SHOPPING HABITS

Data on the characteristics of respondents and on their shopping habits were collected for use in the analysis, as well as to enable the results of this study to be compared with related studies conducted in other geographic areas and with possible future studies. It is also hoped that some of the respondents' opinions and attitudes regarding nursery sales can be explained in part by these characteristics and habits.

Family Income

Each respondent was asked to indicate which of eight categories most nearly described his 1966 family income. The majority of the customers were in the higher income groups (Table 1). Less than one-fourth of the families had incomes below \$10,000 per year; almost 42 percent had family incomes between \$10,000 and \$15,000 annually; 19 percent between \$15,000 and \$20,000; and 13 percent more than \$20,000. The estimated median income of \$12,847 is much higher than the adjusted 1966 Columbus median income of \$7,497 but is roughly comparable to the adjusted 1966 Upper Arlington median income of \$12,202.⁷

⁷Since directly comparable data were unavailable, the 1959 Columbus median income of \$6,675 and median Upper Arlington income of \$10,865 (U. S. Dept. of Commerce, Bureau of Census, U. S. Census of Population, 1960. Ohio, Series PC (1)-37C, p. 317) were adjusted by using the consumer price index values for 1959 and 1966 (U. S. Dept. of Commerce, 1967. Economic Indicators. U. S. Govt. Printing Office, p. 26).

TABLE 2.—Age Distribution of Sample Heads of Households Compared with Those in Pennsylvania State University Study.*

Age	Columbus Study			Pennsylvania Study		
	No.	Percent	Inversely Cumulative Percent	No.	Percent	Inversely Cumulative Percent
20-29	42	8.5	100.0	11	13.4	100.0
30-39	155	31.1	91.6	37	45.2	86.6
40-49	152	30.6	60.4	16	19.5	41.4
50-59	89	17.9	29.8	6	7.3	21.9
60 or more	59	11.9	11.9	12	14.6	14.6
Total	497†	100.0	—	82	100.0	—

*Chi-square = 14.15, d.f. = 4, $P < .01$. All chi-square values were compared with the table values in Blalock, Hubert M., 1960, *Social Statistics*. McGraw-Hill Book Co., Inc., New York, p. 452.

†Ten respondents did not answer the question.

Source: Original data and Bylund, H. B., 1965, *Homeowner Characteristics Affecting Their Landscape Plantings*. Penn. State Univ., Bull. 719, p. 9.

Age of Head of Household

The median age of the sample head of household was 42. Almost 30 percent of the respondents were more than 50 years old (Table 2).

A Pennsylvania State University study found that respondents with well landscaped houses were significantly older than those with poorly landscaped houses.⁸ Table 2 compares the age distribution in this study with that of the respondents having well landscaped homes in the Pennsylvania study. The respondents in this study tend to be significantly older than those in the Pennsylvania study. They were also significantly (at the .001 level) older than the 1960 heads of households in the Columbus Standard Metropolitan Area (Table 3).

Education

More than 58 percent of the husbands had completed 4 years of college and 34 percent had completed more than 4 years (Table 4). Although the wives had not received as much education as the husbands, 35 percent had completed 4 or more years of college. The median educational levels of both husband and wife were much higher than for Columbus and slightly higher than for Upper Arlington.

Home Value

The home values of the sample, as well as incomes, tended to be more similar to those in the high value suburban areas than to those in the Columbus area (Table 5).

⁸Bylund, H. B. 1965. *Homeowner Characteristics Affecting Their Landscape Plantings*. Penn. State Univ., Bull. 719, p. 9.

Age of Home and Years Owned

About 27 percent of the respondents' homes were 2 years old or less, 45 percent were 5 years old or less, and only 39 percent were 9 or more years old (Table 6). Almost 40 percent of the respondents had owned their homes for 2 years or less, more than 63 percent for 5 years or less, and only 22 percent for 9 years or longer (Table 6). Thus, persons

TABLE 3.—Age Distribution of Sample Heads of Households Compared with 1960 Census for Columbus, Ohio.*

Age	Survey Sample		Columbus, 1960 Census†	
	Percent	Inversely Cumulative Percent	Percent	Inversely Cumulative Percent
Less than 25	1.6	100.0	7.8	100.0
25-34	20.5	98.4	26.2	92.2
35-44	34.6	77.9	25.1	66.0
45-54	23.6	43.3	18.6	40.9
55-64	14.5	19.7	12.9	22.3
More than 64	5.2	5.2	9.4	9.4
	100.0	—	100.0	—

*Chi-square = 64.98, d.f = 5, $P < .001$.

†Columbus standard metropolitan area.

Source: Original data and U.S. Dept. of Commerce, Bur. of Census, U.S. Census of Population, 1960, Ohio, Detailed Characteristics, PC (1)-37D, p. 552.

TABLE 4.—Education Level of Sample Husbands and Wives Compared with 1960 Median Level for Columbus and Upper Arlington.

Years of Education	Male or Husband Percent	Female or Wife Percent
Less than 12	4.8	0.8
12	19.2	37.0
13-15	18.0	27.2
16	24.2	20.2
More than 16	33.8	14.8
Total	100.0	100.0
Sample median*	16.3	13.3
Columbus median*	11.8	12.0
Upper Arlington median*	15.7	13.0

*Years.

Source: Original data and U.S. Dept. of Commerce, Bur. of Census, U.S. Census of Population, 1960, Ohio, General Social and Economic Characteristics, Series PC (1)-37C, pp. 274, 286.

owning relatively new and recently purchased homes comprised a large portion of the total garden center customer population.

Distance from Garden Center

Only 3 percent of the respondents lived a mile or less from the garden center and 47 percent lived 7 or more miles from it (Table 7).

TABLE 5.—Distribution of Home Values of Sample and Comparison with Columbus and Upper Arlington 1959 Median Values.

Value of Home	Percent	Inversely Cumulative Percent
\$10,000 and less	0.6	100.0
\$10,001-\$15,000	5.1	99.4
\$15,001-\$20,000	12.6	94.3
\$20,001-\$25,000	20.3	81.7
\$25,001-\$30,000	23.4	61.4
\$30,001-\$35,000	17.9	38.0
More than \$35,000	20.1	20.1
Total	100.0	—
Median (estimated)	\$27,435	
Columbus median	\$13,300	
Upper Arlington median	\$27,500	

Source: Original data and U.S. Dept. of Commerce, Bur. of Census, U.S. Census of Housing, 1960, Ohio, State and Small Areas, HC (1)-37, pp. 74, 89.

TABLE 6.—Age of Homes and Number of Years Respondents Owned Homes.

Years	Age of Home		Years Owned	
	Number	Percent	Number	Percent
1 or less	76	15.0	124	24.4
2	61	12.1	77	15.2
3	27	5.3	45	8.9
4	44	8.7	46	9.1
5	21	4.1	28	5.5
6	19	3.7	23	4.5
7	26	5.1	17	3.4
8	14	2.8	15	3.0
9 or more	196	38.7	109	21.5
No answer	23	4.5	23	4.5
Total	507	100.0	507	100.0

Number of Garden Centers at Which Purchases Were Made in Previous Year

More than 11 percent of the respondents did not make purchases at a garden center in the previous year (Table 8). Less than 31 percent of the respondents made purchases at only one garden center in the previous year and more than 51 percent made purchases at two or more garden centers.

Number of Times Shopped in Previous Year

The majority of the respondents (74.5 percent) shopped at a garden center between 1 to 10 times in the previous year, with approximately 39 percent shopping from 1 to 5 times and approximately 35 percent shopping from 6 to 10 times (Table 9). The garden center manager has relatively few contacts during a year to "sell" the customer.

TABLE 7.—Miles Respondents Lived from Garden Center.

Miles	Number	Percent	Inversely Cumulative Percent
1 or less	17	3.4	99.2
2-3	73	14.4	95.8
4-6	176	34.7	81.4
7-9	64	12.6	46.7
10-25	148	29.2	34.1
More than 25	25	4.9	4.9
No answer	4	.8	—
Total	507	100.0	—

TABLE 8.—Number of Garden Centers Patronized by Each Respondent in 1966.

Number of Garden Centers	Number of Respondents	Percent	Inversely Cumulative Percent
0	58	11.4	93.5
1	155	30.6	82.1
2	119	23.5	51.5
3	87	17.2	28.0
4	34	6.7	10.8
5 or more	21	4.1	4.1
No answer	33	6.5	—
Total	507	100.0	—

Respondents as a group intended to visit a garden center more often in 1967 than they actually did in 1966 (significant at the .001 level). Answers reflect the respondents' expectations of how often they expected to visit a garden center in 1967 and may in fact have been quite different from the actual frequency.

Reasons for Visiting Garden Center

More than 45 percent of the respondents mentioned lower prices as a reason for shopping at this self-service garden center (Table 10). The next more frequently mentioned reason (35 percent) was the novelty of a new store. Location was mentioned by only 10 percent of the

TABLE 9.—Times Visiting a Garden Center in 1966 and Intended Visits in 1967.*

Number of Times	1966 Actual		1967 Estimated†	
	Number of Respondents	Percent‡	Number of Respondents	Percent‡
0	32	6.7	4	1.0
1-5	187	39.1	160	36.9
6-10	169	35.3	174	40.1
11-15	44	9.2	47	10.9
16-20	29	6.1	28	6.5
21-25	8	1.7	12	2.8
More than 25	9	1.9	8	1.8
Total	478	100.0	433	100.0

*Chi-square = 22.65, d.f. = 6, $P < .001$.

†Distribution of number of times expected to visit garden center in 1967

‡Percent of those answering question.

TABLE 10.—Reasons for Visiting This Garden Center.

Reason	Only This Reason Percent	2 or 3 Reasons Percent	Total Percent**†
Lower advertised prices	27.8	17.8	45.6
Novelty of a new store (curiosity)	21.9	12.8	34.7
A friend recommended it	15.2	7.7	22.9
Closer than any other garden store	4.9	5.3	10.2
Like reputation	2.0	2.4	4.4
Other	5.5	4.2	9.7

*N = 507.

**Totals more than 100 because multiple statements were marked.

TABLE 11.—Respondents' Sources of Information About Garden Center.

Source	Percent Utilizing Source*
Newspaper ad	54.4
Friends or neighbors	36.3
Passing by	28.4
Radio	11.8
Have shopped at branch store	10.5
Roadside sign or billboard	9.9

*Totals more than 100 because multiple statements were marked.

TABLE 12.—Person Shopping by Time of Purchase and Person Deciding What to Buy.

Person*	Person Shopping [†]			Decision Maker [‡] Percent
	Mon.-Wed. Percent	Fri.-Sat. Percent	Total Percent	
Couple	40.6	61.8	57.4	57.5
Husband	19.8	18.5	18.7	17.4
Wife	39.6	19.7	23.9	23.3
No answer	—	—	—	1.8
Total	100.0	100.0	100.0	100.0

*Single males and females were classed as either husbands or wives for this analysis.

[†]Chi-square value for M-W shoppers vs. F-S shoppers is 20.74, d.f. = 2, $P < .001$.

[‡]Chi-square value for person shopping vs. decision-maker is .22, d.f. = 2, $P > .80$.

respondents, although in response to the question, How did you learn about this garden center?, 28 percent marked *passing by* (Table 11).

Person Shopping

More than half of the respondents (57.4 percent) were shopping with their spouse when interviewed (Table 12). Slightly more women shopped alone than men (23.9 percent to 18.7 percent). The high proportion of couples shopping may be due to the "no carryout" feature of this garden center. Similar studies of traditional garden centers in other geographic areas have reported that a large percentage of the garden centers' customers were women.⁹ During the weekdays, the percent

⁹Padgett, J. H., Wilbur Mull, and T. L. Frazier. 1965. The Effect of Merchandising Practices by Retail Nurserymen on Consumer Buying. Univ. of Georgia, N. S. 140, p. 8. Sorensen, H. B. 1968. Consumers' Sources of Information on Nursery Products and Landscape Services. Texas Agri. Exp. Station, MP 693, p. 6.

of women shopping alone was higher than for the weekend but was still lower than in other studies (Table 12).

Although it has been hypothesized that the person shopping and the one making the decision of what to buy are often not the same, no significant difference ($.90 > P > .80$) was found in this study between the distribution of those shopping and the distribution of those deciding what to purchase.

APPLICATION OF FACTOR ANALYSIS TO 21 MOTIVATIONAL STATEMENTS

An attempt was made in this study to identify some factors of interest and importance to the customers of a self-service garden center. Factor analysis was used to identify several factors underlying 21 motivational statements which were rated as to importance by the respondents. A list of the statements checked with their average ratings (1—not important to 7—extremely important) is shown in Table 13. Some statements are clearly considered more important than others in the selection of a garden store.

The data for this factor analysis were obtained from 496 responses¹⁰ to the motivational statements. These statements pertained to prices, quality, and store policies, as well as to services. After factor analysis identified the underlying factors from a matrix of the correlations of each statement with every other statement, the relative importance of these factors was determined by an analysis of their scores as rated by the respondents.

Following are several of the basic terms used in factor analysis:

Factors: The isolated clusters of statements which are related to each other but are largely independent of other factors or clusters.

Factor Loading: A number which describes the closeness of the relationship between a statement and the isolated factor. The loadings are correlations of each statement with the isolated factor. The factor loading squared is the percentage of variance accounted for by the factor. The square of the loadings is similar to r^2 in correlation analysis.

Common Factor Variance: The variance in each statement accounted for by each factor. The common factor variance equals the squared factor loading.

Communality Coefficient: The proportion of the variance in each statement explained by all of the isolated factors. This coeffi-

¹⁰Eleven of the 507 respondents did not, as this technique requires, mark each of the 21 statements and were consequently dropped from this part of the analysis.

cient is the sum of the squared factor loadings (common factor variance) of the statement with all of the factors.

In this study, seven factors were extracted from the matrix of inter-correlations (Table 14). Statements with significant factor loadings were selected for each factor. Because of relatively high factor loadings obtained, only loadings above 0.50 were considered when identifying the factors in this study. The statements with significant loadings are grouped and the researcher has subjectively identified each factor with a label which appropriately represents the clustered statements.

The rotated factor loadings are presented in Table 14. The three significant loadings for Factor A are listed in descending order in the first column of numbers. The four significant loadings for Factor B follow in descending order in the second column and so on for each col-

TABLE 13.—Average Ratings of Statements as to Importance in Determining at Which Garden Center to Shop.

Statement with Number Showing Order in Which Question Was Asked	Average Rating*
3. Plants are of high quality	6.54
18. Prices are clearly marked	6.52
19. There is adequate parking space	6.50
8. A large selection of different plants is available	6.28
12. A clerk is promptly available when needed	6.08
17. Desired plants are easy to locate	6.07
16. Plants are fully guaranteed for 1 year	6.06
6. Information on how to plant and grow plants is available	5.86
7. Information about what the plant looks like in all seasons and what its ultimate size will be is available	5.86
11. A large variety of supplies and equipment is available	5.66
2. Prices for supplies and equipment are low	5.50
9. Landscaping advice is offered	5.43
20. The buildings and grounds are attractive	5.38
1. Prices for plants are low	5.26
14. Open evenings	5.25
16. Landscaping service is offered	4.33
10. Tree planting service is available	4.27
21. Delivery service is available	4.22
4. Clerks promptly greet you upon entering the store	4.05
13. Open on Sunday	3.99
5. A clerk stays with you until you make your selection	2.61

*Rated on a scale of 1-7 with 1 indicating not important and 7 indicating extremely important.

column of numbers. Each number in the final column represents the communality coefficient or the percent explained variance of the statement labeling that particular row of factor loadings. This communality coefficient is the sum of the squares of the factor loadings in that row. The complete wording for each statement is in Table 14. The bold face numbers in each column represent the significant loadings for statements which compose the factor which heads the column. Although a particular statement may be significant in two or more factors, it is included in only one of them.

TABLE 14.—Rotated Factor Loadings and Communality Coefficients (h^2).*

Statement†	A	B	C	D	E	F	G	$h^2‡$
10. Tree planting service	78	05	—01	15	04	22	—05	69
15. Landscaping service available	76	01	01	06	09	14	21	65
21. Delivery service available	73	10	—03	08	11	09	17	59
18. Prices clearly marked	—02	71	01	26	—05	16	—00	60
3. Plants are of high quality	00	66	14	—01	02	18	—08	50
17. Desired plants easy to locate	26	63	06	13	08	18	03	52
16. Plants are fully guaranteed	50	52	12	—26	23	06	—02	65
2. Prices for supplies are low	00	08	91	08	00	07	—03	84
1. Prices for plants are low	—02	14	88	02	02	—01	12	81
20. Building and grounds attractive	24	16	02	73	27	—06	—01	69
11. Large variety of supplies and equipment	17	—01	28	64	—04	33	—00	62
19. Adequate parking space	—04	55	—04	63	02	04	09	71
5. Clerk stays with you	07	—05	—01	10	87	08	06	78
4. Clerk promptly greets you	16	14	03	09	82	10	04	74
7. Information about plants available	23	14	02	—00	06	77	—05	67
6. Information on how to plant and grow plants	20	07	07	—02	20	76	—07	67
8. Large selection of plants	01	26	10	22	—10	65	13	57
12. Clerk available when needed	02	32	—06	—01	15	56	15	46
9. Landscaping advice is offered	49	05	—05	12	—00	55	02	56
13. Open on Sunday	07	02	08	—03	—04	—00	80	65
14. Open evenings	18	—04	—01	06	09	05	75	61

*Expressed in hundredths in this table.

†Some statements are abbreviated. Numbers at left of statements show the order in which questions were asked.

‡ h^2 is the communality of a statement or the proportion of the statement explained by the seven factors.

Identification of Factors

To better understand how the appropriate titles for the factors were selected, consider the first statement in Factor A. Statement 10, *tree planting service is available*, has a very high factor loading of .78 on Factor A. If this loading (.78) is squared, the resulting number (.61) is the percent of variance in Statement 10 which is explained by Factor A. The high loading of this statement suggests that perhaps Factor A will be identified as *plant care*. However, the inclusion of Statement 15, *landscaping service is available*, and Statement 21, *delivery service is available*, broadens the interpretation of this factor. Factor A can better be identified as *service*.

The order of extraction does not necessarily reflect the order of importance of the factors to the customer. The order of extraction is based entirely on the variance explained by the original factor (Table 15). The relative importance of the factors to the customers is demonstrated in a subsequent analysis of the factor mean scores.

Factor A: *Service*

The three statements which had a significant loading for this factor, listed in the order of the magnitude of the loadings, are:

10. Tree planting service is available.
15. Landscaping service is available.
21. Delivery service is available.

This factor accounted for 12.0 percent of the total variance among the 21 statements.

TABLE 15.—Summary of Factors Identified and Proportion of Variance Explained.

Factor	Title	Number*	Percent Variance Explained by Original Factor	Percent Variance Explained by Rotated Factor
A	Services	3	23.1	12.0
B	Confidence in merchandising policy	4	9.9	10.4
C	Price	2	7.7	8.3
D	Pleasant shopping experience	3	7.1	7.6
E	Employee conduct	2	6.2	7.9
F	Information	5	5.4	12.0
G	Store hours	2	5.3	6.5
	Total	21	64.7	64.7

*Number of statements with factor loadings above .50.

Factor B: *Confidence in Merchandising Policy*

Factor B accounted for 10.4 percent of the total variance and had a significant loading on four statements:

18. Prices are clearly marked.
3. Plants are of high quality.
17. Desired plants are easy to locate.
16. Plants are fully guaranteed for 1 year.

This factor is somewhat more difficult to identify because of the multiple meanings which can be associated with each statement. However, the underlying factor which seemed to be common to each was labeled *confidence in merchandising policy*. Appearance of statement 18 in this factor suggests that the customer's confidence in the store is increased by clearly marked prices. Statements 3 and 16 suggest confidence that high quality merchandise is handled which the store will stand behind. Statement 17, although its association with *confidence in merchandising policy* is not quite as clear as that of the others, could suggest that advertised plants are not used merely as "loss leaders" or "come-ons" which are not in stock for actual sale.

Factor C: *Price*

This factor, readily identified as *price*, had a significant loading on only two statements but it accounted for 8.3 percent of the total variance. The two statements are:

2. Prices for supplies and equipment are low.
1. Prices for plants are low.

Factor D: *Pleasant Shopping Experience*

Factor D accounted for 7.6 percent of the total variance and had significant loadings on three statements:

20. The buildings and grounds are attractive.
11. A large variety of supplies and equipment is available.
19. There is adequate parking space.

Statements 20 and 19 are both readily identifiable with the title, *pleasant shopping experience*. The association of statement 11 with the factor is perhaps more difficult to discover, but certainly the availability of several desired items at one shopping place contributes to the pleasantness of the shopping experience.

Factor E: *Employee Conduct*

This readily identified factor accounted for 7.9 percent of the total variance and had a significant loading on two statements:

5. A clerk stays with you until you make your selections.
4. Clerks promptly greet you upon entering the store.

The ratings given these statements indicated that it was not important that the clerk promptly greet or stay with the customer. Statement 12, *a clerk is promptly available when needed*, although also pertaining to employees, is more highly correlated with Factor F, *information*.

Factor F: *Information*

This factor accounted for 12.0 percent of the total variability and had significant loadings on five statements:

7. Information about what the plant looks like in all seasons and what its ultimate size will be is available.
6. Information on how to plant and grow the plants is available.
8. A large selection of different plants is available.
12. A clerk is promptly available when needed.
9. Landscaping advice is offered.

Statements 7, 6, 12, and 9 are readily identifiable with *information*. When first considered, statement 8 is not so readily associated with the factor. Perhaps a large selection implies more information in the sense that the plants can be examined and compared visually.

Factor G. *Store Hours*

This final factor, readily identified as *store hours*, accounted for 6.5 percent of the total variance and had significant loadings on two statements:

13. Open on Sunday.
14. Open evenings.

Table 15 gives a summary of the factors identified and the variance explained. The second column of numbers gives the percent of the total variance explained by the original factors and determines the order in which the factors are extracted. The final column of numbers gives the percent of the total variance explained by the rotated factors (the ones which were labeled).

The extraction of factors from the matrix of intercorrelations normally does not explain the total variance in each statement. The seven factors identified in this study explained nearly 65 percent of the total variance (Table 15). The remaining variance is attributable to random error and to unidentified factors. Somewhat more of the total variance could be explained by identifying additional factors. However, given the number of statements used in this study (21), the number of factors rapidly becomes too large and the number of statements in each cluster too small to readily identify the factors.

TABLE 16.—Relative Importance of Motivational Factors.

Factor	Title	Factor Score
1. Factor B	Confidence in merchandising policy	6.30
2. Factor F	Information	5.90
3. Factor D	Pleasant shopping experience	5.85
4. Factor C	Price	5.38
5. Factor G	Store hours	4.62
6. Factor A	Service	4.27
7. Factor E	Employee conduct	3.33

Ranking of Factors

Although factor analysis isolates the factors, it does not indicate their relative importance. The factors were ranked by analysis of the statement scores as rated by the respondents (Table 16). The respondents rated each statement on a scale of importance from 1 to 7 (1 indicates not important and 7 indicates extremely important). The mean of the significant statements in each factor was computed and used to calculate a factor mean score; in other words, the mean of the statements included in the factor gives the factor score. Table 16 lists the factors by the magnitude of the factor scores.

A test was made to determine if there was a tendency for some of the respondents to be "high raters" or "low raters" (i.e., although rating the statements differently, the respondents might tend to rate each statement only at the high end of the scale, or conversely, only at the low end). Therefore, a method of paired comparisons was used when testing the differences between the factor scores for significance. All differences were found to be significant at the .01 level (using a "t" test) except the difference between Factor F, *information*, and Factor D, *pleasant shopping experience* (Table 17).

Factor C, *price*, ranked fourth, not first, in importance. However, it must be remembered that the 5.38 factor score indicates that it is still an important factor, although not as important as Factor B, *confidence in merchandising policy*; Factor F, *information*; and Factor D, *pleasant shopping experience*. It is also possible that the responses reflect an unconscious bias against attaching too much importance to price and that perhaps *price* was more important to the respondents than they affirmed on paper.

Factor B, *confidence in merchandising policy*, was the most important factor to the respondents. Factor F, *information*, ranked second in importance. It ranked slightly higher than Factor D, *pleasant shopping*

experience, but the difference was not significant at the .01 level. The importance of these factors to this garden center's customers may be one reason why they are purchasing plants at a self-service garden center rather than at supermarkets, which also handle low priced plant material.

Factor G, *store hours*, ranked fifth and contained one of the two statements which had a mean rating showing a degree of unimportance rather than some degree of importance (i.e., less than 4.0). Statement 13, *open on Sunday*, had a mean rating of 3.99.

Factor A, *service*, ranked next to last in importance.

The lowest ranking factor was Factor E, *employee conduct*. The title of this factor should perhaps be somewhat qualified since at least one aspect of what could be termed employee conduct (the statement relating to information provided), ranked high in Factor F, *information*. However, Factor E contains the other statement of the only two statements with a mean rating below 4.0. Statement 5, *a clerk stays with you until you make your selection*, was ranked a very low (for this study) 2.61. It

TABLE 17.—Significance of Difference of Paired Motivational Factors.

Factor Pairs	Difference in Means	Variance	"t" Value	Level of Significance
A B	—2.03	.0056	—26.97	.01
A C	—1.11	.0097	—11.23	.01
A D	—1.58	.0063	—19.91	.01
A E	0.94	.0091	9.88	.01
A F	—1.63	.0052	—22.72	.01
A G	—0.35	.0097	— 3.54	.01
B C	0.92	.0038	14.88	.01
B D	0.45	.0020	10.04	.01
B E	2.97	.0061	37.97	.01
B F	0.39	.0018	9.36	.01
B G	1.68	.0072	19.70	.01
C D	—0.47	.0045	— 6.95	.01
C E	2.05	.0094	21.14	.01
C F	—0.52	.0050	— 7.38	.01
C G	0.76	.0092	7.92	.01
D E	2.52	.0065	31.25	.01
D F	—0.06	.0028	— 1.08	.30
D G	1.23	.0078	13.88	.01
E F	—2.57	.0066	—31.65	.01
E G	—1.29	.0114	—12.07	.01
F G	—1.28	.0078	14.55	.01

is possible that this indicates that many customers do not want a clerk with them at all times in a garden store. The other statements associated with this factor (statement 4, *clerk promptly greets you*), although ranking about midway on the importance scale (4.05), was the third lowest ranking of the 21 reasons for selecting a garden store.

In summary, the customers of this garden center apparently do not feel that they need many services. However, low price is not as important to them in selecting a garden center as are things like high quality, guaranteed plants, availability of information about the plants, and pleasant shopping conditions. The store hours are not of major concern to them, especially being open on Sunday, and they do not think it is important (indeed, they may not want) to be closely attended by clerks.

COMBINING AND ANALYZING THE DATA

More of the customers who stated that low prices were very important when selecting a garden center agreed that prices were lower at this garden center than did those to whom price was not an important factor in selecting a garden center (Table 18). Thus, price appeared to be important in attracting almost 42 percent of the total customers. This supports the results already presented where 46 percent gave lower advertised prices as a reason for coming to this garden center.

TABLE 18.—Amount of Agreement That This Garden Center's Plant Prices Are Lower by Respondents Who Think Price Important and Relatively Unimportant.*

Amount Agreement Plant Prices Lower†	Low Price Very Important Factor‡		Low Price Slightly Important or Not Important**	
	Number	Percent	Number	Percent
1-3	12	5.5	22	8.2
4	29	13.4	51	19.0
5	26	12.0	55	20.5
6	53	24.4	55	20.5
7	97	44.7	85	31.8
Total	217††	100.0	268††	100.0

*Chi-square = 14.5, d.f. = 4, $P < .001$.

†Rated on a scale of 1-7 with 1 indicating strong disagreement and 7 strong agreement.

‡Rated 1-7 on 7 point scale with 1 indicating not important and 7 indicating extremely important.

**Rated 1-7 on 7 point scale with 1 indicating not important and 7 indicating extremely important.

††Total N = 485 since 22 respondents did not answer one or both questions.

When the purchases by the respondents who listed lower advertised prices as a reason for coming were compared with those of the total sample, there were no significant differences in actual purchases made by the two groups (Table 19).

However, there was an apparent difference in the reason for coming to this store for those making no purchase and those purchasing \$15 or more (Table 19). Of those who came because of lower advertised prices, fewer proportionally made no purchase and more proportionally made a large purchase than for any other reason except, *like store reputation*. All of the respondents in the latter category made some pur-

TABLE 19.—Magnitude of Purchases on Day Interviewed by Respondents Coming Because of Lower Advertised Prices Compared with Those of Total Sample.*

Amount of Purchase	Came Because of Lower Advertised Prices		Total Sample	
	Number	Percent	Number	Percent
\$0	15	6.5	45	8.9
\$1-\$5	62	26.8	155	30.6
\$6-\$10	54	23.4	117	23.1
\$11-\$15	35	15.1	69	13.6
\$16-\$20	24	10.4	44	8.7
\$21-\$25	11	4.8	24	4.7
\$26-\$30	7	3.0	18	3.5
More than \$30	23	10.0	35	6.9
Total	231	100.0	507	100.0

*Chi square = 7.0 df = 7, 50 > P > 30

TABLE 20.—Amount of Purchase on Day Interviewed by Reason for Coming.

Reason for Coming	No Purchase		Purchases More Than \$15		Total Number of Shoppers
	Number	Percent of Shoppers	Number	Percent of Shoppers	
Like store reputation	0	0.0	11	50.0	22
Lower advertised prices	15	6.5	65	28.1	231
Friend recommended it	8	7.3	29	25.0	116
Novelty of a new store (curiosity)	18	10.2	30	17.0	176
Closer than any other garden store	6	11.5	8	15.4	52

chase and 50.0 percent spent more than \$15. However, only 22 of the respondents came for this reason—much fewer than for any other reason (Table 20).

While lower advertised prices was the most frequently mentioned reason for coming, almost 35 percent of the respondents gave the novelty of a new store as a prime reason for coming (Table 10). This indicates that for many people curiosity rather than the self-service, low price concept perhaps was the major reason for visiting this garden center. This seems even more feasible when the data presented previously on the number of garden centers patronized and the frequency patronized is considered. As shown, 28 percent of the respondents patronized three or more garden centers in 1966 (Table 8) and more than 54 percent visited a garden center more than five times. One might conclude from this that many of these customers were shopping around or trying out a new garden center. On the other hand, 23 percent came because a friend recommended it, although the garden center had only been in operation for about 2 months at the time of the study.

Location ranked fourth out of six factors mentioned and tested in frequency mentioned as a reason for coming. Only 10 percent indicated that this garden center was closer than any other (Table 10). The very high percentage of the respondents who lived nearer to another garden center, the fact that 79 percent of the respondents had made a special trip to the garden center, plus the fact that 47 percent lived more than 6 miles from the garden center (Table 7) indicate that convenient location is not the major reason for customers patronizing this garden center.

Price

Price was ranked as a moderately important factor by these customers in determining at which garden center to shop (Table 16) and price was the major factor influencing them in coming to this garden center (Table 10).

Padgett, in a study of customers of traditional garden centers in Georgia, found that the demand for nursery stock was relatively inelastic.¹¹ However, the determination of price elasticity for a product comprised of as many different items as nursery stock is difficult.

Sorensen found in a study of customers of the regular service type garden center in Texas that the elasticity varied with the type of plant. Specimen trees¹² were inelastic, trees and shrubs for group plantings

¹¹Padgett, J. H. 1961. Economic Analysis of the Consumer Market for Woody Ornamentals. Univ. of Georgia, Mimeo Series N. S. 108, p. 12.

¹²Trees which are usually planted singly as opposed to in groups. They are usually higher quality varieties than those used for group plantings, are often purchased in larger sizes, and are consequently more expensive.

TABLE 21.—Expressed Reactions by Respondents to Variations in Price of Landscape Plants.

Expressed Reaction	Lower Prices 10%			Lower Prices 20%			Lower Prices 30%		
	N*	% of Total	% of Answers†	N*	% of Total	% of Answers†	N*	% of Total	% of Answers†
Purchase same	294	58.0	78.4	204	40.3	54.4	111	21.9	29.6
Purchase more	81	16.0	21.6	171	33.7	45.6	264	52.1	70.4
No answer	<u>132</u>	<u>26.0</u>	<u>—</u>	<u>132</u>	<u>26.0</u>	<u>—</u>	<u>132</u>	<u>26.0</u>	<u>—</u>
Total	507	100.0	100.0	507	100.0	100.0	507	100.0	100.0

*Number of responses.

†Percent of those answering.

were slightly elastic, and plants for mass plantings (i.e., bedding plants) were very elastic.¹³

In this study, landscape plants, trees, and shrubs were grouped and the respondents were asked if they would purchase more or same quantity of plants in this category if the price were lowered 10 percent, 20 percent, and 30 percent respectively. Answers to this question support the hypothesis that these customers are responsive to price changes. Almost 22 percent of the respondents to this question indicated a willingness to purchase more landscape plants if prices were lowered 10 percent; almost 46 percent indicated a willingness to increase purchases if prices were lowered 20 percent; and more than 70 percent indicated a willingness to increase purchases if prices were lowered 30 percent (Table 21).

These responses were further analyzed to determine the importance, in terms of magnitude of actual purchases, of the customers responding in the different ways to the price changes. In other words, did the customers with the higher dollar volume of purchases respond to price reductions in the same way as other customers? The responses were analyzed also by home value and family income, as well as for 1966 landscape plant purchases.

No significant relationships were found between different home values, family incomes, or between the purchasers of different amounts of landscape plants in 1966 and the indicated responses to price change.

A separate but related question to customer responsiveness to price change is whether or not there is a price/quality relationship in the consumer mind in regards to landscape plants. The responses in terms of agreement with two statements, *low prices usually mean low quality landscape plants*, and *it is possible to find bargains in landscape plants by looking around*, indicate that there is little price-quality relationship in the customer's mind for the sample as a whole. The mean (3.89) of the responses to the statement, *low prices usually mean low quality landscape plants*, indicate that about as many agree as disagree. The mean (5.68) of the responses to the statement, *it is possible to find bargains in landscape plants by looking around*, indicate that more agree than disagree. However, the distribution of the responses to the first statement reveals that there is a tendency for individual customers to either strongly agree or strongly disagree.

¹³Sorensen, H. B. and A. F. DeWerth. 1967. Garden Center Sales Study. Dept. of Agri. Econ. and Soc., Texas Agri. Exp. Sta., Texas A & M Univ., Dept. Inf. Report 67-14, pp. 19-20.

SUMMARY AND CONCLUSIONS

The self-service garden center has eliminated several high cost services and has altered some of the policies and practices of the usual service-type garden center operation. It is evident even through casual observation that the resultant "new merchandising package" is attracting customers. Some factors and services which are offered, such as low prices, apparently have stronger appeals for a large number of customers than others, such as personal service, which have been given up. These factors have not been fully identified and their relative importance to the consumer have not been determined. If these factors and their importance were known, the garden center operator could better serve his customers and thereby possibly increase his volume of business and his profits.

The customers of the garden center studied have much higher annual incomes, own higher value homes, and have received more years of formal education than Columbus residents in general. Incomes and educational levels for the sample were similar to and higher than the averages for Upper Arlington or Worthington, two relatively high income communities from which more than one-third of the customers came. The heads of the households in the sample were found to be significantly older than for the average Columbus household. Finally, a substantial proportion of the respondents' children were grown and no longer lived at home. These facts indicate that these respondents have more money than the average family to spend on landscaping and perhaps more free time for landscaping.

A majority of this garden center's customers (63 percent) owned their present home for 5 years or less. Furthermore, a larger proportion of the respondents who had owned their homes only a few years made large purchases on the day interviewed and spent more in 1966; a smaller proportion made no purchases on the day interviewed or in 1966 than did the respondents who had owned their homes a longer period of time.

In view of the above points, perhaps much of the advertising and promotion of a garden center should be focused, in terms of content, media utilized, and possibly geographic area covered, toward relatively new home owners.

It was found that the three most frequently mentioned ways that the respondents learned about the garden center were, in descending order, from newspapers, friends or neighbors, and passing by the store. Two other forms of advertising (radio and billboards) ranked fourth and sixth respectively in frequency cited by the respondents.

Fifty-seven percent of the shoppers were couples shopping together, while husbands shopping alone accounted for 19 percent and wives shop-

ping alone 24 percent. On Mondays through Thursdays a lesser proportion of couples shopped (although still a greater proportion than either husbands alone or wives alone).

Factor analysis was used to identify seven factors from 21 motivational statements which the respondents rated as to importance when selecting a garden center.

The identified factor which was most important to the respondents when selecting a garden center was *confidence in merchandising policy* or the concern for honesty, high quality, and guaranteed, easy-to-locate plants. *Price* ranked fourth. This would suggest that the facets of the first factor, such as plant quality and plant guarantees, should receive more attention than price in advertising and promotion. However, the fact that advertised price was mentioned more often than any other factor (Table 10) as a reason for visiting the garden store would mean that there is more than one dimension to price as a motivating factor.

The second most important factor identified was *information*. Since the respondents did not agree strongly that this garden center provided enough verbal and printed information about the plants, they are apparently patronizing the garden center in spite of the lack of information rather than because of the availability of it. This is perhaps an area in which this garden center can improve its customer relations or perhaps an area in which the service-type garden center could gain an advantage over the self-service type.

The third most important identified factor, *pleasant shopping experience*, reveals the importance of the surroundings (in terms of convenience and attractiveness) to the customer when shopping. This finding should encourage some of the service-type garden centers in cramped or poorly designed facilities to enlarge and modernize them when possible. This may offer a way for them to gain back some of the customers lost to the self-service garden center without changing their price policy.

Store hours, the fifth most important identified factor, raises a question about a popular nursery retailing concept—having to remain open on Sundays. The respondents felt that a store's being open on Sunday was unimportant to them in selecting a garden center and rated this statement (one of two identified with the factor *store hours*) next to the lowest of all 21 statements.

Services was the factor ranked (not unexpectedly) next to last by the respondents. These customers apparently do not need and do not want to pay for many services provided by service-type as opposed to self-service garden centers.

The lowest ranking factor, *employee conduct*, raises a question about another nursery retailing practice currently receiving much attention at

trade meetings. The low ranking of this factor implies that at best these customers do not care whether they are promptly greeted by a clerk and that most of them prefer to be left alone while selecting their merchandise at their leisure. However, under *information* it was noted that customers strongly want a clerk available when they need one.

Many aspects of this garden center's operation which apparently attracted customers to it are not exclusive to a self-service type of operation; for instance, its attractive well-designed building, its wide selection of plants, and its newness or novelty. Location was not found to be important. A significant proportion of the respondents (almost half) cited lower advertised prices as a reason for coming to this garden center. Low price is considered unique to a self-service type of operation, at least in comparison with other garden centers, although every center has its own price image. It was found also that the low-priced plants were attracting more people than the low-priced hard goods.

The novelty of a new store was the second most frequently cited reason for coming (35 percent), a reason which could not entirely be attributed to the self-service type of operation per se. Another 23 percent came because it was recommended by a friend and undoubtedly some friends recommended it because of its lower prices or its combination of low prices and high quality.

The evidence of customer responsiveness to price changes suggests that the self-service garden center with its lower prices may be attracting "new" purchases (ones which would not have been made had this type of garden center not been available). The conclusion that this happened was reached from the results of a separate analysis which indicated that for some customers, the reduced prices at this garden center also eliminated prices as an obstacle to plant purchases. However, a self-service garden center is in no position to overcome the obstacles most frequently mentioned by these customers (*not enough time to plant and take care of more plants, no need for more plants, and not enough money left after other living expenses paid*).

The present study has barely scratched the surface in the study and evaluation of the self-service garden store. It remains to be seen whether this form of merchandising will develop as in the food industry into the major means of distribution or whether it has a more limited application. Studies such as this of customer preferences, needs, and complaints can assist in the development of outlets which will better serve producer, consumer, and retailer.

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