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Using Students in a State University for a Pilot Study When Designing a Sample for a State Survey¹

By Norman Nybroten

There is a constant need for new techniques of marketing research. In this article the author reports and evaluates the use of a preliminary investigation among the students of a State university to gain knowledge about how to design a State-wide survey.

WHAT can be learned, through surveying students at a college or university, that will help when a sample is to be designed for use in a study of consumer reactions and preferences? That question is bound to occur again and again to researchers who have a body of students constantly at hand.

To test the matter, a survey of 597 persons, mainly university students, was made at West Virginia University. The subject chosen was egg marketing. The principal factors to be considered were related to color, size, freshness, and quality of eggs. It is expected that in some of the future work in egg marketing at West Virginia University, controlled experiments will be carried on in retail stores in order to study consumer behavior under manipulated conditions. These conditions will deal mainly with the factors involved in the questions of this student survey, which was, in effect, a preliminary or exploratory step.

Where to carry on the experiments had been one of the immediate problems in planning that research. It was assumed that if the students from different parts of the State responded differently, these differences would probably serve as a basis for delineating, for sample purposes, areas within the State. The "home county" of the student was used as the designation of his home.

It may be that the students in universities, if proper methods and adjustment can be found, may serve as usable and inexpensive samples of consumers generally. This generalization is subject to considerable discussion and modification as exemplified in the test at West Virginia. These modifying considerations are here reviewed.

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As to the Responses

It turned out that in none of the factors studied was there any statistically significant difference between or among different areas. This does not mean that there are not significant differences within the State but it could not be determined by questioning 531 area-designated students.

It has often been said, for instance, that Charleston, W. Va., is a "white-egg" market. The survey did not refute this but it did not show Charleston as favoring white eggs more than did the rest of the State. Preliminary examination of the data seemed to indicate that the northern panhandle might have a decided preference for white eggs over brown eggs but, upon analysis, this difference was not significant. For the State as a whole, the students answered, in round figures, that they thought brown eggs should be worth 76 cents a dozen when white eggs were 80 cents; and 47 cents when white eggs were 50 cents. The two assumptions as to price were used to learn whether their ideas were in terms of an absolute difference or a percentage difference—actually the average result lies between these ideas.

The students were asked to fill in the cells of the following tabulation, assuming Grade A eggs of medium size to be worth 42 cents a dozen. (Incidentally, from the standpoint of obtaining rationalization on the values of "Not sized" and "Not graded for quality" the table was set up incorrectly. Until the line on which "Not sized" appears, the logical values have decreased going downward on the table. This trend served as a "trap" so that many respondents put not-sized eggs at a value lower than Peewee. The same condition pertained to "Not graded for quality"; it would have been better to ask for this information in a separate place in the questionnaire.)

Prices of sizes and qualities of eggs

Sizes	Quality, grades, and prices				DO NOT WRITE
	A	B	C	Not graded for quality	
Jumbo.....	-----	-----	-----	-----	-----
Extra large.....	-----	-----	-----	-----	-----
Large.....	-----	-----	-----	-----	-----
Medium.....	42	-----	-----	-----	-----
Small.....	-----	-----	-----	-----	-----
Pullet.....	-----	-----	-----	-----	-----
Pewee.....	-----	-----	-----	-----	-----
Not sized.....	-----	-----	-----	-----	-----
DO NOT WRITE.	-----	-----	-----	-----	-----

Although no significant differences could be found in preferences, between the major geographic areas of the State, there seemed to be a difference on some points between the ideas of respondents from rural areas and those from urban areas; these are indicated later. Of the 531 students included, 140 were farm-reared and 391 were not reared on farms. There was no significant difference between the responses of farm-reared and the other students as to the premium they stated they would pay for Grade A eggs over Grade B eggs.

The survey showed that the awareness of differences in egg-weight classes is not in proportion to differences in weight. When Grade A medium-size eggs were postulated at 42 cents a dozen, it meant that these eggs were, on a weight basis, worth 2 cents an ounce of minimum weight. Table 1 is based on this assumption, but instead of giving the prices for Grade A eggs the figures are the students' estimates of values for eggs having equal numbers of each of Grade A, Grade B, Grade C, and a lesser number of eggs not graded for quality. Note from the first column the values (prices) that should have been placed on a weight basis according to the assumption.

In general, the students do not have enough sensitivity to size differences in classes of eggs. For instance, on the "value, weight basis" there should logically have been a difference of 22 cents a dozen between "Extra Large" and "Pullet." This difference was found for each respondent, and a comparison was made between students reared on farms who expressed an average difference of

TABLE 1.—Cents per dozen placed on eggs in different size classes

Sized class	Value, weight basis	Cents per dozen placed by different groups			
		Farm-reared students	Non-farm students	All students	Wholesale market ¹
Jumbo.....	55.0	48.4	52.4	51.4	47.7
Extra Large.....	49.5	46.1	48.3	47.7	44.3
Large.....	44.0	43.0	43.9	43.6	42.7
Medium.....	38.5	38.6	38.5	38.5	38.5
Small.....	33.0	35.0	34.9	35.0	-----
Pullet.....	27.5	32.2	31.6	31.8	30.7
Pewee.....	-----	27.2	27.3	27.2	-----
Not sized ¹	-----	35.4	36.3	36.0	-----

¹ The figures for "Not sized" should not be accepted without modification. As the text implies, there was a bias because of the set-up of the questionnaire. To offset this, at least in part, all responses placing "not sized" lower than Peewee were rejected. Figures on the wholesale market are from the Connecticut Poultry Producers Association, adjusted by a constant making the prices of "Medium" the same as the other series shown.

13.9 cents per dozen and those not reared on farms who expressed an average difference of 16.7 cents per dozen. The difference between these averages was statistically "highly significant." As a further check the variances around the averages of "Extra Large" in the two groups were analyzed; it was found that the difference between these was significant at the 95-percent level.

There was some evidence that beliefs of students in regard to the points involved in this study were influenced by college instruction to some extent. Respondents were classified by major study into "Agriculture," "Home Economics," "Business Administration," and "Other." Students who were majoring in agriculture mentioned noticeably smaller differences between their ideas of the value of white eggs and brown eggs than did the other groups, but it should be remembered that this did not hold true on the basis of whether or not they were farm-reared. On the basis of sensitivity to size differences those who were majoring in agriculture were definitely further from a rational weight-basis value than were the other groups. Contrary to what might have been expected, there was nothing in their replies to distinguish home economics majors from other majors.

Married and single students did not differ significantly in responses to questions in the survey.

Discussion

If these respondents can be accepted as a representative sample of the State, the responses would seem to mean that *farmers could gain more than they now believe possible by classifying eggs by size*. This assumes, of course, that the farm-reared students represent producer ideas and the others represent consumer ideas. It also assumes that the wholesale market could be changed.

Comparison between the farm-reared students and the others poses an interesting question regarding the wholesale market. Ordinarily an intelligent rational market serves as a moderator between producers and consumers. Ordinarily a market resolves into economic gain both the material and the conceptual differences between buyers and sellers. If this were true in regard to egg sizing, it would be expected that the figures for the wholesale market in table 1 would fall between the other two groups. Nonfarm students placed Extra Large at 48.3 whereas the wholesale market put this class at 44.3. Why did not consumers and then retailers and jobbers bid this class up? How can the wholesale market obtain these eggs at the price indicated when the farm-reared students place them at 46.1 cents?

Answers lie in one of two possible facts—either these data from the survey do not represent producer and consumer groups or the wholesale market for eggs is not necessarily intelligent or rational. Certainly more work needs to be done to learn to a more valid and accurate degree the ideas of producer and consumer groups. But it is also possible, or even probable, that the idea that consumers will react a certain way may be an erroneous one, established by relatively few people in the wholesale trade. For example, the belief that certain cities or areas have color preferences in regard to eggs may be a misconception of a few dominant wholesalers who, by their resulting action, establish what appears to be a preference. If these are misconceptions of the market, then merely to study and simulate the present market will not reveal them. Rather, that would require a more ideal set-up in which consumer behavior is the important entity.

In an effort to get at some of the puzzling points, two correlations were run to find whether there were relationships between types of preferences or sensitivities. One correlation was run on the

values placed on brown eggs compared with the values placed on storage eggs—this resulted in a direct correlation of only $+0.131$, disclosing virtually no relationship. Another was run between sensitivity to quality differences compared with sensitivity to size differences. This also brought a very low direct correlation coefficient of $+0.425$, indicating an association of about 18 percent.

In Conclusion

From the standpoint of designing experiments to discover consumer preferences, it is important to know whether preferences and sensitivities are interdependent because this should be a determinant in the design. In stratifying consumers in preference studies, it may be important to know that if a respondent seems unusually penurious it is likely that other unusual behavior may be associated. Actually, an exceptionally frugal but logical person would have helped to bring about a lower correlation between sensitivity to quality and sensitivity to size for he would have leaned toward a weight-basis in regard to size and would have suggested little difference in prices for qualities, because present standards for quality do not seem to be related to nutritional value.

Perhaps the most interesting facts evolved were that students not reared on farms expressed a greater response to size in eggs than did the farm-reared students and that both farm-reared and others showed greater sensitivity than is reflected in the wholesale market. As the sensitivity was in no case proportional to the relative weights of eggs, the question arises as to whether the Federal combination of quality grades and sizes may be too complex for the average consumer.

It seems that marketing logically divides into two major categories: (1) Finding out what consumers want and (2) satisfying consumers' wants with a minimum of effort. Studying consumer wants through their behavior is usually an expensive kind of research, yet such research is contemplated and a start has been made in the Northeast in regard to eggs. It is anticipated that under a cooperative project between BAE and West Virginia University, consumer-expressed opinions and consumer behavior in retail stores will be correlated in an effort to seek more efficient methods of sampling. Such groups as students in large institutions will be studied further from the standpoint of sampling efficiency.