



This is to certify that the

thesis entitled


The Effect of Odd and Even
Retail Pricing on Value Determination,
Product Perception and Purchase Propensities

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ABSTRACT

THE EFFECTS OF ODD-EVEN RETAIL PRICING ON VALUE DETERMINATION, PRODUCT PERCEPTION, AND BUYING PROPENSITIES

By

David M. Georgoff

The study examines the effects of odd and even retail price endings on a heterogeneous group of eleven department store items and attempts to determine, for each item, the direction and intensity of any price illusion. In addition, the influence of price endings on subjects' indicated buying dispositions and product perceptions are analyzed, as are differences in illusion susceptibility for selected demographic classifications; for subjects' indicated buyer roles; for past buying experience; and for future buying intentions.

The study involves two essential stages. The first is a simulated inquiry in which differences in the mean responses of 243 subjects to selected questions about each of the items, which were randomly assigned odd or even endings, were used as a basis for establishing the effects of the alternative price endings.

Using an experimental approach, the second stage involves a measure of sales of the eleven items for a

four-week period within the six stores of a leading department store group. During this phase the items were also assigned odd or even retail endings for predetermined weekly periods. The total sales at each of the prices were then analyzed to determine the sales impact of the alternative endings, and to provide some measure of the strength of the illusions which were revealed in the previous stage.

The results of the study indicate that in the aggregate (i.e., summing across all subjects) no evidence of price illusion appears to exist. Furthermore, the alternative price endings do not appear to influence subjects' indicated purchase dispositions or perceptions of products as measured by ten factor analyzed, semantic differential scales. In addition, significant differences in illusion susceptibility do not appear to be associated with the subjects' indicated buyer roles, with past purchase experiences, or future buying intentions.

Illusion susceptibility, however, did vary within selected demographic strata. Subjects who are more highly educated, whose household heads have white collar jobs, who earn higher family incomes, or who have female household heads employed full-time, are susceptible. In addition, the direction of the illusion appears mixed; influenced by the type of product. In some cases odd prices enhance the value impressions of an item while in other cases they depress them--and vice versa. A comparison of the results of the two stages of the study shows the

absence of significant variations in the second phase and a low level of relationship between the results of the two stages. This suggests that while price illusion appears to exist for certain products within selected demographic segments, any net effect on sales is relatively weak or is swamped by situational and intervening variables.

THE EFFECTS OF ODD-EVEN RETAIL PRICING ON VALUE
DETERMINATION, PRODUCT PERCEPTION, AND
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By

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A project of any magnitude is seldom the product of any single person. In looking back it becomes apparent that this study also incorporates the direct and indirect assistance of many individuals. Although mentioning each would be overly burdensome and impossible at this point in time, simple gratitude compels me to acknowledge the help of some major contributors.

In this light I must first mention the assistance provided by the executives and associates of Burdine's whose selfless cooperation made it possible to conduct the second phase of the study in their stores. I also deeply appreciate the financial support made available by the Department of Marketing and Transportation Administration at Michigan State University, which allowed me to undertake a study of this scope, and the computer assistance furnished by the Computer Technology Department of Florida Atlantic University. In addition, Dr. Francis E. Brown of the Warton School of Finance and Commerce, University of Pennsylvania, provided valuable suggestions which were incorporated into the first phase of the study.

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CHAPTER I

INTRODUCTION

A Statement of the Problem

Marketing practitioners and theorists have for many years been intrigued by abnormal variations in "customary" or expected patterns of demand. Conventional wisdom as well as economic theory assume that customers purchase more of a product the lower it is priced. It is reasonable to expect that this assumption holds true across an infinite range of price points as long as the ceteris paribus condition prevails. We therefore expect that the demand curve for any product is a smooth negatively sloped function. But empirically we often find significant non-random variations in the normal patterns of demand which violate such assumptions about buyer price behavior. While economists generally view such variations as atypical, insignificant, and outside their legitimate realm of concern, marketing practitioners and students of consumer behavior consider such phenomena significant for two basic reasons. First, they have pragmatic value because the results suggest that certain price points have either enhancing or deterring effects on demand. Knowledge of the existence, direction, and

[illegible]

impact of such phenomena offers an astute pricemaker a measure of competitive advantage. Such knowledge suggests price points that increase the appeal of his offering, or cautions him against the use of other endings that may leave his offering relatively disadvantaged.

The second reason is less direct, but in the long run may be more important. Selected price points may be relatively insignificant and justify no more than the passing concern of the businessman establishing price endings, but an understanding of the cause of such deviations provides insights into the customer decision processes. The point was recognized by the late Gary Steiner who stated that, "No difference is too small to be of scientific value, although it may be too small to be of practical value."¹

Although variations are discounted as irrational by the traditional economist, they are a product of the customer's inner rationality² and a prime concern of the student of consumer behavior. Because the actions of customers can be assumed to involve higher order mental processes, the student of consumer behavior must take

¹Gary A. Steiner, "Consumer Behavior: Where Do We Stand?" in On Knowing the Consumer, ed. by Joseph W. Newman (New York: John Wiley & Sons, Inc., 1966), p. 206.

²Robert W. Pratt, Jr., "Consumer Behavior: Some Psychological Aspects," in Science in Marketing, ed. by George Schwartz (New York: John Wiley & Sons, Inc., 1965), p. 110.

[illegible]

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note of external manifestations of behavior in order to construct plausible and predictable explanations consistent with the actions of consumers in varying situations.³ Any abnormal increases and decreases in sales which may occur at certain price points are profitable topics of inquiry for these students.

These variations are classified under the heading of psychological pricing, which in the broadest sense includes such phenomena as: fictitious pricing, bait pricing, prestige pricing, and odd pricing.⁴ The term psychological pricing has various interpretations. These range from specific rules stating, "Whenever possible price your product so that the customer can pay for it with one coin or bill, and get something back in the way

³James F. Engel, David T. Kollat, and Roger D. Blackwell, Consumer Behavior (New York: Holt, Rinehart and Winston, Inc., 1968), pp. 20-23.

⁴Perry Bliss, "Price Determination at the Department-Store Level," Journal of Marketing, XVII (July, 1952), 44; Edward R. Hawkins, "Price Policies and Theory," Journal of Marketing, XVII (January, 1954); Clare W. Barker and Ira Anderson, Principles of Retailing (New York: McGraw-Hill Book Company, Inc., 1935), p. 166; Andre Gabor and C. W. J. Granger, "Price Sensitivity of the Consumer," Journal of Advertising Research, IV (December, 1964); Donald V. Harper, Price Policy and Procedure (New York: Harcourt, Brace & World, Inc., 1966), p. 39; John Cameron Aspley and John Cousty Harkness, The Sales Manager's Handbook (9th ed.; Chicago: The Dartnell Corporation, 1962), p. 242; Jules Backman, "Pricing," in Science in Marketing, ed. by George Schwartz (New York: John Wiley & Sons, Inc., 1965), p. 276.

of change,"⁵ to more general definitions which include all prices that have great consumer appeal,⁶ or that maximize profits through margin-volume concerns.⁷

Although these phenomena have underlying similarities which justify broadly grouping them under the psychological pricing term, they also represent practices and effects which differ in many essential respects. In addition, because many of the phenomena overlap they do not represent mutually exclusive classifications. For this reason it is necessary to refine the scope of this inquiry still further. Specifically, the thrust of this effort will be directed primarily at a consideration of the effect on sales which arises from the use of odd and even retail price endings.

But there is no general agreement as to the exact meaning of odd and even price endings. Some authors have interpreted even prices to include quotations with endings which are divisible by five,⁸ whereas others have

⁵Louis T. Montant, Jr., "How to Determine Prices," Printers' Ink (September 10, 1948), 30.

⁶Harper, Price Policy and Procedure, p. 281.

⁷Q. Forrest Walker, "Some Principles of Department Store Pricing," Journal of Marketing, XIV (January, 1950), 533.

⁸Harold J. Rudolph, "Pricing for Today's Market," Printers' Ink, CCXLVII (May 28, 1954), 22.

[illegible]

considered even prices to be those divisible by two.⁹ Generally odd prices are said to include quotations in the immediate price ranges under an even dollar (whether ending in 88, 95, 97, 98 or 99 cents); while even prices are those ending in round dollar amounts.¹⁰

Price illusion, or the tendency of a prospective customer to perceive a price variation which cannot be justified by an absolute difference in a price quotation, is assumed to be created by pricing merchandise just under an even dollar. But any attempt to measure this illusion must recognize a complication which arises as a result of customary retailing practices. Because of historical associations and retailing conventions, certain price endings are given different interpretations by prospective buyers.¹¹ Some price endings (notably

⁹Milton H. Spencer and Louis Siegelman, Managerial Economics (2d ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1964), p. 356.

¹⁰Eugene Jerome McCarthy, Basic Marketing: A Managerial Approach (3d ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1968), p. 551; Harper, Price Policy and Procedure, p. 282; Hawkins, "Price Policies and Theory," p. 234.

¹¹Alfred Oxenfeldt, Executive Action in Marketing (Belmont, California: Wadsworth Publishing Co., Inc., 1966), pp. 54-55; Oswald Knauth, "Considerations in the Setting of Retail Prices," Journal of Marketing, XIV (July, 1949), 8; Edgar A. Pessemier, "A New Way to Determine Buying Decisions," Journal of Marketing, XXIV (October, 1959), 46; Bliss, "Price Determination at the Department-Store Level," p. 44.

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88, 97, and 99)¹² are generally used with sale, promotional, or clearance merchandise. Therefore, an item may be purchased at these endings for two reasons: the sales appeal suggested by the ending, and the illusion created by the use of the odd price.

In order to isolate such influences it is necessary to further restrict the range of this inquiry. Only prices ending in 98 cents and even dollars will be considered. This, presumably, would limit the effects of the study to the odd-even price illusion issue.

The fact that odd prices are extensively used is well established. This popularity is underscored by surveys made of the incidence of various price endings.¹³ These surveys also reveal the widespread association of the figure nine with promotional merchandise. As a result, it is hypothesized that because of this nine-promotional association the figure should be avoided by quality stores.¹⁴ Conversely it is suggested that the

¹²As an extreme example refer to: "88-Cent Store Does Well in Secondary Location," Chain Store Age, XXXV (December, 1959), E22f-E22g.

¹³"The Right Way to Price," Super Market Merchandising, XXIII (May, 1958), 163-166; "Set Prices Psychologically," Progressive Grocer, XLI (February, 1962), 178; "Psychology Makes Cents in Pricing," Printers' Ink, CCXLIV (October 29, 1954), 45; Dik Warren Twedt, "Does the '9 Fixation' in Retail Pricing Really Promote Sales?" Journal of Marketing, XXIX (October, 1965), 54-55; Rudolph, "Pricing for Today's Market," pp. 22-24.

¹⁴Fred M. Jones, Principles of Retailing (New York: Pitman Publishing Corporation, 1949), p. 287.

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nine figure has an inherent appeal to price-conscious customers.¹⁵ To the extent that the nine-promotional association does exist it would increase the impact of odd price endings, particularly if the price also includes a dollar break (e.g., \$9.98 as opposed to \$10.00) which results in a so-called "double-nine" effect.

This nine-promotional effect is not the same as the sale endings discussed earlier. The essential difference is that even prices presumably create a prestige effect which deters price-conscious buyers while appealing to quality conscious customers; although in both cases the items are assumed to be regular merchandise sold at regular prices.

The Issue

The issue of odd and even price endings has for many years been a concern of retail price setters and manufacturers--particularly those manufacturers who pre-mark merchandise or in other ways use suggested retail prices.¹⁶ Yet as extensive as interest in the issue has been, surprisingly little has been published in the way

¹⁵Delbert J. Duncan and Charles F. Phillips, Retailing: Principles and Methods (5th ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1959), p. 454.

¹⁶As an example of this concern refer: Barker and Anderson, Principles of Retailing, p. 166.

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of rigorous research which would offer price makers reliable guides for resolving their dilemma.¹⁷

The classic study of the effect of odd and even price endings in an actual sales situation was reported in 1936.¹⁸ Although few details were made available, a mixed effect was found. Without specifics one cannot establish the range of variation in sales, or determine the extent to which the conditions of the study are applicable to the present, but the very fact that substantial fluctuations in response to alternative price endings did occur is in itself significant. It strongly suggests that the effects of various price endings can be substantial.

Within the past few years experimental studies of subject responses in simulated purchase situations have been conducted. One of the studies attempted to measure the probable reaction of subjects to a range of market prices. Because the study was conducted in England (which introduces differing value orientations, cultural influences, economic orientations, and market processes) the findings can only be cautiously

¹⁷For examples of some of the earlier studies refer to: Montant, "How to Determine Prices," p. 30; Knauth, "Considerations in the Setting of Retail Prices," p. 10; Aspley and Harkness, The Sales Manager's Handbook, p. 244; Barker and Anderson, Principles of Retailing, p. 167.

¹⁸Eli Ginzberg, "Customary Prices," American Economic Review, XXVI (June, 1936), 296.

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generalized. The results indicated that the impact of odd prices varied among products. In one case odd prices immediately below even price points were found to be significantly more effective as an inducement to purchase than either even prices or prices which fell in the range below the odd price points. In another case no effect attributable to the odd price was found.

The conclusion of the researchers was that odd pricing has no apparent effect. The impact in the case of the first product was assumed to be the result of a history of industry-wide odd price promotions and the conditioning effect it had on consumers. Because of this it was felt that prices other than those at the traditional price points were viewed as unreal by the subjects.¹⁹

An experimental study conducted in the United States by Holloway also involved a simulated purchase situation, and produced results supporting the existence of effects attributable to odd prices. After testing the subjects' "bargain" and "quality" perceptions of twenty-four products (ranging in price from one to two hundred dollars) Holloway concluded that, ". . . even prices were perceived as being of higher quality than the same product carrying an 'odd' price." The results also indicated

¹⁹Gabor and Granger, "Price Sensitivity of the Consumer," pp. 266-268.

that, ". . . 'odd' priced items were seen as being greater bargains than the same item carrying an 'even' price."²⁰

The findings of the Holloway study support the existence of some influence arising from price illusion, but it is not possible to determine if the results arose from the illusion created by the odd price, from the nine-promotional association, or from some combined effect. The study does suggest that odd or even price endings affect a consumer's product perception in discernably different ways.

Two opposing views exist with regard to the issue. One is that no price illusion is created--the implicit assumption being that the customer is an astute (rational) buyer and is not deceived by the use of odd prices. The opposing view is that the customer perceives a \$3.98 price as being significantly lower than the two-cent differential would justify. It is assumed that he translates the price into the deliberative processes as three dollars and something, rather than rounding it to the four dollar figure. Then, in the traditional view, the customer weighs the perceived price against a product's promised stream of satisfactions (which are assumed

²⁰Robert J. Holloway, "Experimental Work in Marketing: Current Research and New Developments," in Application of the Sciences in Marketing Management, ed. by Frank M. Bass, Charles W. King, and Edgar A. Pessemier (New York: John Wiley & Sons, Inc., 1968), pp. 393-394.

[illegible]

constant) and the value is enhanced because of the resulting higher quality-price ratio.²¹ In the end, marginal customers are induced to purchase the product--resulting in greater sales at odd prices.²²

In addition to these opposite views some middle positions also exist. Some feel that the issue has not been adequately investigated and that further study is needed,²³ or that the effect is probably mixed and is not determinable.²⁴ Others hold that the effect of odd prices is not a product of price illusion, as traditionally viewed, but is the result of the retailer pricing his product as low as possible.²⁵ It is also suggested that such prices became established, and are subsequently effective simply as a matter of custom.²⁶ Whatever the cause, those that hold odd pricing is effective view the

²¹Where: $\text{Quality/Price} = \text{Value}$.

²²As an example of some positions supporting this view refer to: John W. Wingate and Elmer O. Schaller, Techniques of Retail Merchandising (New York: Prentice-Hall, Inc., 1950), p. 162; "Psychology Makes Cents in Pricing," p. 45; Aspely and Harkness, The Sales Manager's Handbook, p. 244; Backman, "Pricing," p. 276.

²³Harper, Price Policy and Procedure, p. 283.

²⁴Wingate and Schaller, Techniques of Retail Merchandising, pp. 162-163.

²⁵Harper, Price Policy and Procedure, p. 283; Barker and Anderson, Principles of Retailing, p. 167.

²⁶Stanley C. Hollander, "Customary Prices," Business Topics, XIV (Summer, 1966), 47; Barker and Anderson, Principles of Retailing, p. 167; Wingate and Schaller, Techniques of Retail Merchandising, p. 162; Gabor and

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demand curve for a product not as a smooth, but as a kinked curve that is relatively more elastic at the odd-even price points (see Figure 1).

The original reasons offered for such deviations differed widely, and in present terms appear naive,²⁷ but in time they were formulated into explicit guides to pricing behavior.²⁸ Because marketing has been concerned with interdisciplinary consumer behavior studies for only a relatively short time, one can appreciate why the explanations lacked sophistication. Also explaining the lack of any deeper inquiries into the issue was the essential pragmatic orientation of the businessmen, whose concern was limited to whether the phenomenon in fact existed, and if so, in what way and to what extent it would affect the sale of various products. They felt that little of value was to be found in a more exhaustive study of the issue, and as a result, were satisfied with the somewhat superficial inquiries which were undertaken.

Granger, "Price Sensitivity of the Consumer," p. 40; Harper, Price Policy and Procedure, p. 283; Knauth, "Considerations in the Setting of Retail Prices," p. 10; Backman, "Pricing," p. 276.

²⁷As examples refer to: Harper, Price Policy and Procedure, pp. 282-283; Barker and Anderson, Principles of Retailing, p. 167.

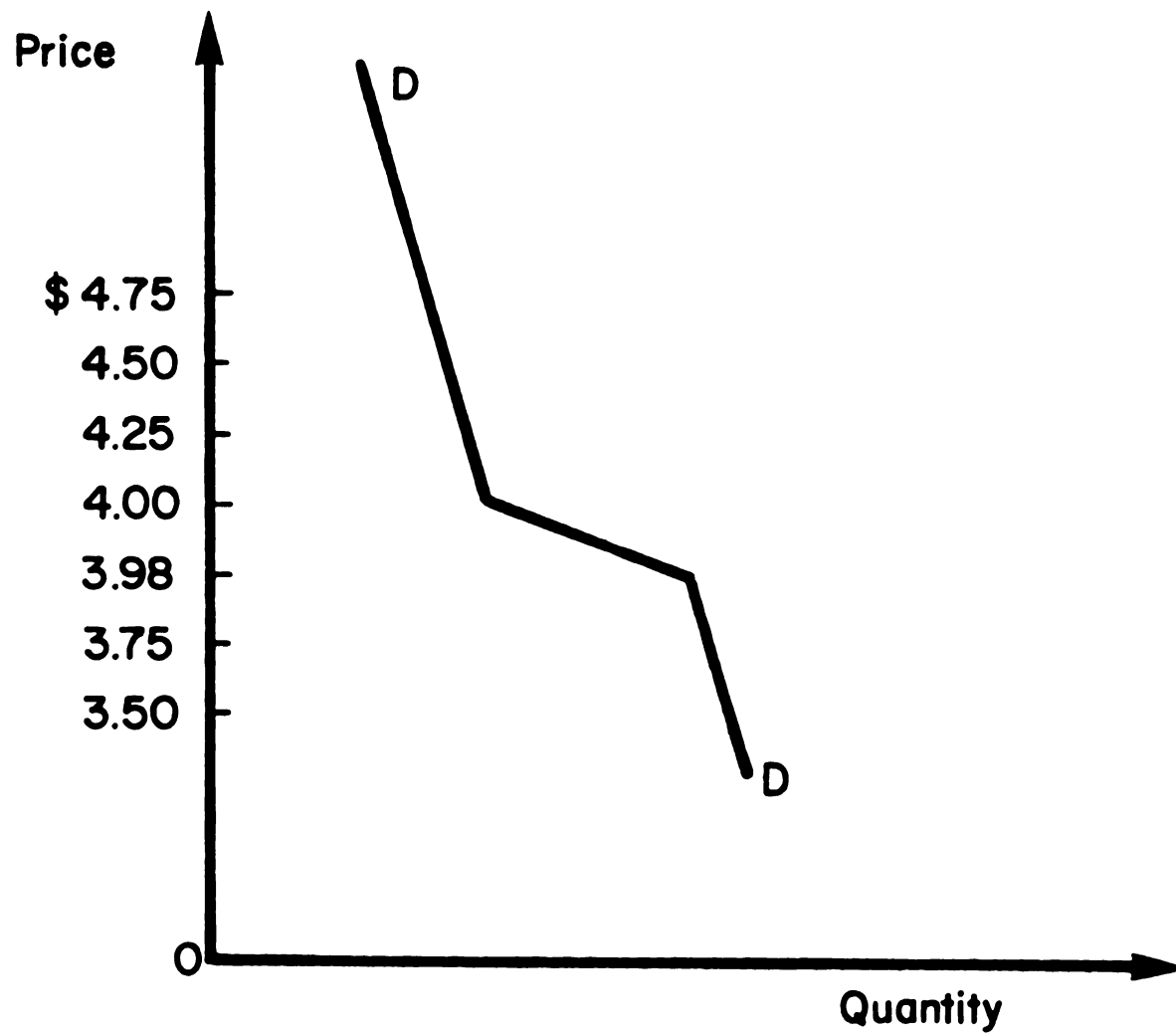
²⁸"Psychology Makes Cents in Pricing," p. 45; Aspley and Harkness, The Sales Manager's Handbook, p. 243.

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Figure 1
DEMAND CURVE WHEN ODD-EVEN RETAIL
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Even today the issue is far from being resolved. On the one hand widespread adoption and persistent use of odd prices suggests that price illusion is, or was, an effective buying influence. Alternatively, growing adoption of even prices by department and specialty stores suggests that the impact of illusion may be so weak as to allow some retailers to forego the advantages of any price illusion with no substantial effect on either volume or customer reaction. Because of the significance of the issue (the fact that it touches directly or indirectly all retailers and manufacturers), the potential impact as suggested by the Ginzberg and Holloway studies, the reasons which prompted the adoption of odd prices in the past, and because of the possible insight further study may provide about the consumer decision processes, it would appear that a further inquiry is justified.

The Significance of the Issue to the Retailer

Empirically a retailer or manufacturer might consider hedging the issue by charging the odd price, the rationale being that if the illusion arising from odd prices is strong its use would allow the retailer to take advantage of the situation. The cost of selecting this alternative, in the extreme case where an impact does not exist, is the foregone revenue between the odd and the even prices. The cost of the alternative in the

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situation of a 98 cent ending is about 2% (more specifically 2.04%) for a dollar item, then it quickly becomes infinitesimal, being about .5% for a four dollar item and about .2% for a ten dollar item. As a result one might argue that the issue is trivial and the lost revenue is well worth the hedge in an area of such uncertainty.

If the foregone revenue does not appear impressive in relative terms, the situation changes dramatically when viewed in absolute dollars. In the simplified case of a department store doing \$30,000,000 volume per year, and an average gross sale of \$6.00,²⁹ the number of items sold is 5,000,000. Assuming the store uses 98 cent endings exclusively, the store has foregone \$.02 per item.³⁰ Assuming one item per transaction, the total foregone dollar amount is \$100,000. Moreover, because no

²⁹An approximation derived from Average Gross Sales for Year, for main store departments of Department Stores with Annual Sales of \$20-\$50 million as offered in: National Retail Merchants Association, Controllers Congress, Departmental Merchandising and Operating Results of 1964 (New York: National Retail Merchants Association, 1965).

³⁰The simplified assumptions being used may strike the critical reader as extremely naive in that they assume all sales are made at regular price or that the store employs 98 cent endings for sale merchandise, that small transactions such as greeting cards and candy also use 98 cent endings, the impact of multiple pricing does not exist, and that 98 cent endings are also used on major items. On the other hand, this example is intended for illustrative purposes, and the incorporation of extensive, although realistic, qualifications would not significantly alter the essential point being raised.

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incremental costs are associated with the incremental revenue, in the short run the impact on the firm's earnings before taxes would be direct.

Alternatively, if a retailer uses even prices for all products when the illusion created by the use of odd prices is strong, his prices are perceived to be significantly higher and marginal sales are lost in the short run. If his competitors employ odd prices, their prices would appear to be substantially lower, causing a shift of sales in the competitors' direction. In the long run (because these price impressions are probably generalized)--a store's even price levels seem to be more expensive, resulting in a weakening of customer loyalty to the store.

Even after making allowances for the simple assumptions used in the above examples and recognizing that what has been offered is a limiting case, it appears that the matter is an important concern for retailers.

The issue is simpler for the manufacturer. Assuming that retail markup percentages are not sensitive enough to reflect the differences in retail price endings (which seems probable for items retailing beyond two dollars per item) the astute manufacturer should pre-mark his merchandise at the odd price. Because the retailer's markup calculations (by assumption) are insensitive to the differential, the manufacturer need not reflect the

differential in the invoice price. If no odd price illusion exists he is unaffected and the retailer absorbs the lost revenue. To the extent that odd price illusion is real, his products are afforded an advantage over competitive brands priced in even dollars. Against this advantage he has only to weigh the cost of the possible antagonism of retailers who prefer even dollar endings. Although the pull strategies used by many manufacturers have the effect of creating varying degrees of brand preference for their products, and weakening the influence and leverage of the smaller retailers,³¹ the astute manufacturer cannot completely discount any such reaction.

The General Approaches to the Problem

For most retailers the approach to the problem has often been gross. As will be discussed, the assumption is that odd-even influences operate either strongly or have no effect. But when the range, direction, intensity, and variety of influences affecting purchase decisions within product categories are considered; when the scope of influences affecting the perception of price and price illusion is recognized; and when these price conditioning effects are aligned by product (resulting in some which are conflicting to produce a weak price effect and

³¹Michael Halbert, ed., The Meaning and Sources of Marketing Theory (New York: McGraw-Hill Book Company, 1965), p. 163.

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others which are reinforcing to produce a strong effect), the possibility arises that price impact may vary substantially between products.

Furthermore, because there are perceptions, needs, and purchase dispositions common to specific groups, the impact of price illusion also varies between customer types. Moreover, when one considers that the customer mix of each department and specialty store is unique as a result of the location, promotional policies, service mix, and merchandise offerings of the retailer, it is also possible that profit maximizing odd-even price policies will vary by store.

Finally, because customer types often purchase different items in a department or specialty store, and because these customer types possess different degrees of illusion susceptibility and are disposed toward products with varying illusion effects, the ultimate blends which occur at the point of purchase produce product-customer combinations which are either mutually reinforcing or conflicting. Because the combinations will vary from synergistic to antagonistic, it is possible that the intensity of buying effects would vary by product, customer, store, and cyclical period. In some cases the effects may be very strong and in others they would be weak, but without additional information it is not possible to determine the appropriate circumstances, direction, or

intensity. The extent to which these effects exist suggests that a general rule applied to the price endings of a firm may prove costly. If such a rule is used the firm may not maximize all incremental revenues from the sale of certain items, while at the same time it might fail to realize all of its potential volume from other product categories.

To the typical retailer price endings are a third-order concern. More attention is usually devoted to adequate representation in important merchandise types, to balancing assortments, and to adding items to increase stock interest. Short-run profits are subordinated to reinforcing the proposed store image and to maximizing the long-run attraction of a department.³² Another concern is the establishment of appropriate price zones for merchandise, although pricing is predetermined and routinized because of practices established in the trade, agreements with manufacturers, pre-marking, competitors'

³²On the other hand there exists some evidence to suggest that the approach of many merchants is hardly a sophisticated one. Simplified assumptions and objectives appear to be the rule with short-run sales maximization their overriding concern. As an example markon in percentage terms is often used as a simple proxy for assessing alternative item profitability [Douglas J. Dalrymple, "Quantitative Methods of Measuring Merchandising Performance in Selected Department Stores," in Reflections in Progress in Marketing, ed. by L. George Smith (Chicago: American Marketing Association, 1964), pp. 119-131.]

actions and potential reactions, and the policies of the store.

Even the alternative price endings available to a merchant are predetermined. It has been established that within a given cultural context certain price points have significant communication value.³³ For this reason merchants assume that a consistent price ending policy provides: greater impact through the use of established promotional and sale endings, some measure of control over pricing abuses, and minimum organizational drift. For these reasons most large retailers have policies, expressed or implied, concerning the use of various price endings. However, these policies often originate at the general management level and are therefore made to apply to broad groups of products (with certain exceptions in highly competitive departments such as drugs, toys in season, and traffic appliances).³⁴ Additionally, policies are established at points far removed from the selling floor and may tend to be insensitive to product demand variations. For these reasons it would seem that most price ending decisions are often the result of a few

³³Pessemier, "A New Way to Determine Buying Decisions," p. 46; Bliss, "Price Determination at the Department-Store Level," p. 44; Knauth, "Considerations in the Setting of Retail Prices," p. 8; Oxenfeldt, Executive Action in Marketing, p. 54.

³⁴Knauth, "Considerations in the Setting of Retail Prices," p. 2.

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generalized considerations and some uncritical assumptions perpetuated from the past. Nevertheless they are applied to a range of products whose demand characteristics differ widely with respect to the effects of odd or even prices. If the impact is strong and varies between products, such a generalized approach will not maximize profits. It will prove costly from a sales or profit maximizing point of view regardless of the alternative selected; that is if the impact of odd prices is universally strong while even price endings were used, and vice versa.

The Distinction Between Effect and Illusion

Because of the diverse influences affecting the purchase decision, customer responsiveness to the price variable differs widely among products. It is necessary to make a distinction between the strength of the illusion which arises from an odd price and the ultimate effect that will have on sales at retail. Such a distinction is needed, because with the impacts created by the intervening variables, it does not always follow that a strong illusion will translate itself into a strong effect. As an example, in the case of an item with a highly inelastic demand the sales effect of both odd and even price endings will be the same no matter how strong the illusion. Because of this, a measure of retail sales

is insufficient because it does not provide a measure of any illusion which may have arisen. Conversely, a simple measure of illusion is insufficient for two reasons. First, because of the elasticities existing among products, it is to be expected that product sales will have only an incidental relationship to the product's illusion intensity. Therefore, any measure of illusion cannot be used to accurately predict an item's relative sales effect. Second, as a result of the intervening variables, it can be expected that the sales effect relative to any illusion would be dampened for any product.^{35,36} But a test of effect coupled with a test of illusion would make it possible to determine roughly how much weaker the effect on sales may be. Moreover, without a measure of effect following one of illusion there is a tendency to overvalue the impact of the illusion.

One of the leading factors dampening the effect of illusion arises from convenience and minimization of effort. Generally it is considered a burden for customers

³⁵This would explain such inconsistent situations in which women's expressed preferences--presumably valid--are for G. E. refrigerators over Frigidaire, although the latter outsells the former. James H. Myers and William H. Reynolds, Consumer Behavior and Marketing Management (Boston: Houghton Mifflin Company, 1965), p. 56.

³⁶As an example of some intervening variables which illusion must overcome are: product design, quality distinctions, brand preferences, promotional effects, availability of alternatives, past product experiences, and others which will be developed later in the paper.

to compare prices between all retailers because of the time and effort required. As a result, customers estimate the probable payoff from additional search against the secondary purchase costs of making the comparisons.³⁷ Probable payoffs would include, in addition to the actual savings in product price, improved terms of sale, as well as the psychic value provided by the assurance of a price comparison.³⁸

We can assume that shopping is a burdensome chore for many customers and competes with other demands on limited time.³⁹ Consistent with this view, one marketing theorist comments:

The initial state of the consumer is one in which she hopes to visit a single store, get everything she wants, and get it at a favorable price. Once she is in the store, pressure of

³⁷Wesley C. Bender, "Consumer Purchase Costs--Do Retailers Recognize Them?" Journal of Retailing, XL (Spring, 1964), 1-8; Donald L. Shawver, The Development of Theories of Retail Price Determination in England and the United States, Illinois Studies in the Social Sciences, Vol. XXXIX (Urbana, Illinois: The University of Illinois Press, 1956), p. 79.

³⁸Alfred Oxenfeldt, et al., Insights Into Pricing from Operations Research and Behavioral Science (Belmont, California: Wadsworth Publishing Company, 1961), pp. 98-101.

³⁹For an elaboration of the sensitivity of the time issue refer to: Charles J. Cellazzo, Jr., Consumer Attitudes and Frustrations in Shopping (New York: National Retail Merchants Association, 1963), p. 116; William P. Dommermuth and Edward W. Cundiff, "Shopping Goods, Shopping Centers, and Selling Strategies," Journal of Marketing, XXXI (October, 1967), 32-36; Bender, "Consumer Purchase Costs--Do Retailers Recognize Them?" pp. 1-8.

time may cause her to buy what she wants even though the prices are higher than she expected, and accept substitutes for preferred items, or go without temporarily. . . .⁴⁰

The issue is that the concept of customer convenience has many dimensions which are very real in determining purchases.⁴¹ These dimensions are recognized both by the astute retailer in formulating retailing mixes,⁴² and by customers in selecting patronage alternatives.⁴³ While we expect the impact of this concept of convenience to vary among products, its net effect, especially in the short run, is to dampen significantly the intensity of any illusion.

It is possible to speculate about the intensity of any given illusion. Using two goods as an example, one with elastic and one with inelastic demand, and assuming all other factors are equal, the following would likely

⁴⁰Wroe Alderson, Dynamic Marketing Behavior (Homewood, Illinois: Richard D. Irwin, Inc., 1965), p. 228.

⁴¹Eugene J. Kelley, "The Importance of Convenience in Consumer Purchasing," Journal of Marketing, XXIII (July, 1958), 32-38.

⁴²Seymour Baranoff, "Retailing as an Operating System," in Theory in Marketing, ed. by Reavis Cox, Wroe Alderson, and Stanley J. Shapio (Homewood, Illinois: Richard D. Irwin, Inc., 1964), pp. 160-161; Bender, "Consumer Purchase Costs--Do Retailers Recognize Them?" pp. 4-7.

⁴³Jon G. Udell, "Prepurchase Behavior of Buyers of Small Electric Appliances," Journal of Marketing, XXX (October, 1966), 52.

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occur when the illusion produced by each of the items is the same:

1. If the illusion is weak, the ultimate effect on sales will be weak. In this case the profit maximizing retailer would price his merchandise in even dollars.

2. If the illusion is strong, and assuming that no substantial dampening effect arises from the intervening variables, the sales effect will be strong for items with elastic demand. In this case the item should be given an odd price. On the other hand, if the demand is elastic, but the dampening effect is strong, even price endings can probably be used with no substantial deterrent effect on sales.

3. If the illusion is strong and the demand for the item is inelastic, at least in the short run, the use of even prices is justified. Additionally, the use of even price endings is appropriate regardless of whether the intervening variables are strong or weak.

The Approach of the Study

As a result of the considerations previously discussed, a two-stage approach to the problem was undertaken. The first phase involved a specific test of illusion. Using a simulated situation an attempt was made to determine if the respondents' value estimates for a heterogeneous group of products (which were

randomly assigned odd or even prices) differed significantly. The study design also made it possible to determine: whether the subject's perception of the item was affected by the alternative endings; whether selected demographic characteristics were related to illusion susceptibility; whether illusion was affected by the subject's past or proposed purchases of the item or by his perceived buyer role; and whether the use of odd or even prices influenced the expressed purchase disposition of the subject.

The second phase attempted to determine the sales effect of odd or even retail price endings. This phase involved a measure of actual sales at retail for the same items used in the first stage. Using an experimental design which incorporated controlled rotation and change-over, a four-week measure of sales at randomly determined odd and even prices in six stores of a leading department store group was conducted. Because the research design provided control against the influences of confounding variables, it provided a precise and unambiguous measure of the effect of odd and even price endings on sales for each of the items.

The availability of measures of illusion and effect for identical items permitted some rough basis for determining the amount of dampening created by intervening variables. While recognizing that such dampening

would also include effects arising from sample differences, differences attributable to the structure of the studies, error variance, as well as the effects of the intervening variables, it was still felt that some assessment of the treatment effects for each of the items between the two phases would provide a basis for determining the extent to which the illusion effects translate themselves into buying determinants.

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CHAPTER II

THE PRICE VARIABLE--ITS RELATIONSHIP TO DEMAND

Historical Antecedents of Odd and Even Prices

The issue of odd or even prices could not arise until the one price policy became prevalent in retailing. The Quakers were said to have experimented briefly and unsuccessfully with the one-price system in the 17th Century,¹ but its institution was discouraged because of the widespread barter system which dominated trade at the time and because there existed no standardized currency.² The establishment of the one-price system has been attributed, at one time or another, to A. T. Stewart of New York³ and John Wanamaker of Philadelphia.⁴ It is generally agreed that institution of the one price policy became firmly established shortly after the close of the Civil War. At that time it was the practice of merchants to price merchandise in even dollars so as to conform to

¹Shawver, Theories of Retail Price, p. 47.

²Ibid., p. 67.

³Ibid., pp. 71-72.

⁴The Golden Book of Wanamaker Stores (Philadelphia: N. P., 1911), p. 28.

the existing coinage system.⁵ Captain Macy, founder of the R. H. Macy Company, is claimed by some authors to have been the first to introduce odd prices as an outgrowth of the application of a fixed markup percentage.⁶

Other authors have stated that odd pricing arose from several sources; one of the earliest was said to have developed from the conversion of the English pound sterling into dollars. As a result of the quality attributed to English goods, odd prices in time became associated with superior products. Because of this relationship, in the middle of the nineteenth century odd prices were used by retailers to lend a quality image to their wares.⁷ Paradoxically, in the 1920's and 30's, because of their promotional link, odd prices were often associated with products of inferior quality;⁸ a factor which probably weakened their later impact.

It was only after even or "round" prices became established that odd pricing as we know it emerged as a

⁵John Freeman Pyle, Marketing Principles: Organization and Policies (New York: McGraw-Hill Book Company, Inc., 1931), p. 358.

⁶Parch C. Kelley and Norris B. Brisco, Retailing: Basic Principles (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1957), pp. 27-28.

⁷History of Macy's of New York, 1858-1919 (Cambridge, Massachusetts: Harvard University Press, 1943), pp. 52-53.

⁸Delbert J. Duncan and Charles F. Phillips, Retailing: Principles and Methods (Chicago: Richard D. Irwin, Inc., 1941), p. 501.

common retail pricing practice. A survey of the New York Times reveals that occasional odd prices appeared in the 1850's and 1860's although the practice did not become widespread until the turn of the century. The incidence of odd pricing then rose rapidly until 1910, during which time about 40% of advertised products were quoted in odd endings. The next decade saw a 25% drop in odd price quotations followed by another sharp rise in the next five years. It has been suggested that this last rise in odd price quotations was, in part, attributable to the depression.⁹ Odd prices then stabilized at about 55% or 60% of the quotations for the following thirty years.¹⁰

Writers offer various reasons for the success of odd prices. Some feel that the initial impact was because of their uniqueness;¹¹ because customers like to get change back;¹² because they give the impression of

⁹G. Henry Richert, Retailing: Principles and Practice (3d ed.; New York: Gregg Publishing Division of McGraw-Hill Book Company, Inc., 1959), p. 307.

¹⁰"Odd-pricing in the Retailing of Consumer Goods Throughout the Past 100 Years" (unpublished study, Florida Atlantic University, 1966).

¹¹Walter F. Kohn, "98 Cents or \$1--Which is Better Price Strategy?" Printers' Ink, CCL (January 7, 1955), 30.

¹²John W. Wingate, Techniques of Retail Merchandising (2d ed.; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1956), pp. 171-172.

reductions from higher prices;¹³ or because they suggest that the merchandise was marked at the lowest possible price.¹⁴ The three common reasons offered for the rise of odd prices are: (1) the creation of an illusion that reduces resistance to purchase, (2) employee honesty is encouraged because sales must be rung in making change, and (3) the customer, waiting for change, is more inclined to purchase other items.¹⁵ In a more exhaustive inquiry into the arguments supporting the evolution of odd prices one author has found that the practice has been attributed to a compelling belief that ". . . circles attract the eye . . ." and ". . . transient, foreign born, and scatter-brained people are attracted by odd prices . . ."¹⁶

Some writers hold that variations in illusion are related to differences in sex in that women are more

¹³Pyle, Marketing Principles: Organization and Policies, p. 358.

¹⁴Harold H. Maynard, Walter C. Widler, and Theodore N. Beckman, Principles of Marketing (New York: Ronald Press Company, 1927), p. 545.

¹⁵Harold A. Baker, Principles of Retail Merchandising (New York: McGraw-Hill Book Company, Inc., 1939), p. 187; Duncan and Phillips, Retailing: Principles and Methods, 5th ed., p. 453; Richert, Retailing: Principles and Practices, p. 306; Harper, Price Policy and Procedure, pp. 282-283.

¹⁶Hollander, "Customary Prices," p. 49.

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susceptible to price illusion than are men.¹⁷ The extent of this belief is supported by the survey of odd and even retail prices in the New York Times. The incidence of odd and even price quotations reveals that the percentage of advertised odd prices of women's products was consistently and significantly higher than men's.¹⁸

Looking back through the origins, establishment, and rise of odd pricing, and relating these movements to the parallel comments available in the leading texts of the time (which presumably had some influence in shaping the views of the practitioners and teachers of retailing) several conclusions seem justified. Retail pricing began with the use of even or "round" prices, and given the low level of real buying power common at that time, one can assume that a high degree of price sensitivity existed. Recognizing also that this sensitivity occurred in a market milieu in which the influence of heavily advertised national brands and new product introductions were relatively unimportant factors (two influences which have presumably contributed to reducing price sensitivity and the creation of price inelasticity), the initial impact and subsequent spread of odd pricing can be understood.

¹⁷Paul H. Nystrom, Economics of Retailing, Vol. I (3d ed.; New York: Ronald Press Company, 1930), p. 28; Kohn, "98 Cents or \$1--Which is Better Price Strategy?" p. 32.

¹⁸"Odd-pricing in the Retailing of Consumer Goods Throughout the Past 100 Years," pp. 2-12.

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This is particularly true if it is recognized that price explicitly enters into almost every consumer transaction. Given the prevailing values of the times it seems that price would often serve as the determining variable. Therefore, any departure from customary pricing practices would probably have been noticed and would have been given some interpretation by the customer.

With this in mind, it would seem that although the initial value appeal was probably quite effective, in time prices began to stabilize at common price points; such as 95 or 98 cent endings. Thereafter any effect arising from odd prices was probably a result of price illusion or some nine-value association, as these endings were invariably considered to be regular merchandise at regular prices.

Throughout this time one finds two general approaches in literature. One echoes and reechoes the same essential justifications for odd pricing found in most books on the subject. The same views exist in unaltered form in many texts even today.¹⁹ Possibly a confirming effect was created by the widespread statements of belief offered in these (presumably authoritative) publications.

¹⁹William R. Davidson and Alton F. Doody, Retailing Management (3d ed.; New York: Ronald Press Company, 1966), p. 469; Robert D. Entenberg, Effective Retail and Market Distribution (Cleveland: World Publishing Company, 1966), p. 233; Delbert J. Duncan and Charles F. Phillips, Retailing: Principles and Methods (7th ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1967), p. 484.

On the other hand, many authors questioned the existence of any illusion. Such challenges generally took the form of simple assertions or statements of doubt, as the issue was seldom considered to be significant enough to warrant an exhaustive inquiry which would have questioned the effects of changing market influences or altered buyer dispositions. While several attempts to measure the strength of the effect were undertaken, these efforts were conducted by retailers who had little knowledge of research methodology or experimental designs. Because of this, most of the studies used insensitive before-after designs. The findings were inconclusive because of the confounding effects caused by uncontrolled variables and in the end these findings failed to offer a convincing challenge to prevailing views.

There is the possibility that the perpetuation of these views in literature served to sanction the prevailing beliefs which, in time, became self confirming, although the original conditions which made odd pricing effective had changed.²⁰ The current incidence of even prices suggests that any price effect is possibly weaker now than in the past.

²⁰For additional discussion and support for this view refer to: Hollander, "Customary Prices," p. 49; Kohn, "98 Cents or \$1--Which is Better Price Strategy?" p. 32.

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One author has noted that there are objective and subjective aspects inherent in the structure of prices which help explain the perpetuation of the odd pricing practice. The objective aspect is defined as the ". . . way in which the buyers and sellers often adjust their actions to the prevailing custom, so that in time the custom . . . merges into . . . the hard realities of the economic world."²¹ The subjective is viewed as, ". . . the way in which whatever is traditional or universal becomes so much a part of ourselves that we seldom are really aware of its existence."²² Recognizing the provocative possibilities suggested, it may be that the practice was established as a result of a widespread planned defensive reaction on the part of early merchants.²³ Although the beliefs of merchants are subject to shifts, it is possible that as the practice became established the use of odd pricing was viewed as the common, the expected, and the "right" price by the customer. In time customers might be expected to react to deviations from such "established" price points. This would further perpetuate the use of odd prices as an

²¹Hollander, "Customary Prices," p. 46.

²²Ibid.

²³Walker, "Some Principles of Department Store Pricing," p. 534; Twedt, "Does the '9 Fixation' in Retail Pricing Really Promote Sales?" p. 55.

institution,²⁴ particularly so when changes to even prices undoubtedly would be interpreted as a price change on the upside, removing any assurance that the item was being priced as low as possible.

The Significance and Function of Price

Price is a summary figure which often becomes a critical issue in the purchase process. One statement of the function of price notes that:

Price is a monetary expression of value and is the focal point of the entire exchange process. . . . Price quantitatively expresses a large number of subjective evaluations made by the consumer and by the supplier concerning the value of the money exchanged for goods sold. Any change in these evaluations will result in a change in the quantity exchanged or a change in prices.²⁵

In addition, it is said that: "Prices are at bottom, psychological phenomena."²⁶ With this in mind it seems that a consideration of price perception and any effort to measure the relative significance of price focuses on a central aspect of the purchase process.²⁷

²⁴As an example of the strength of this presumed effect refer to: Andre Gabor and C. W. J. Granger, "Price as an Indicator of Quality: Report on an Enquiry," Economica, XXXIII (February, 1966), 60; Gabor and Granger, "Price Sensitivity of the Consumer," pp. 40-44.

²⁵Thomas A. Staudt and Donald A. Taylor, A Managerial Introduction to Marketing (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965), p. 451.

²⁶Halbert, The Meaning and Sources of Marketing Theory, p. 123.

²⁷Pierre Martineau, Motivation in Advertising (New York: McGraw-Hill Book Company, Inc., 1957), p. 5; Alderson, Dynamic Marketing Behavior, p. 31.

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Prices as purchase determinants are not always assumed to be specific points. Some believe that the customer approaches the purchase decision, and an evaluation of its primary elements--the product and the price--in an open ended fashion.²⁸ He is assumed to have a price range or limit within which he expects to make the purchase.²⁹ Others offer an even more precise description of the process, holding that customers attribute an upper and lower price to every commodity. When prices are within the range, they submit that price is a latent factor. Only when the price is above or below these limits does it become manifest. A price exceeding the upper ranges would be considered expensive, and any item priced below the lower range would have its quality questioned.³⁰

Others hold that retail prices need not be exactly the same to be "competitively right." They feel that customers will grant a retailer a "zone of tolerance" conditioned by the services and atmosphere the retailer

²⁸Alderson, Dynamic Marketing Behavior, p. 111.

²⁹Ibid., p. 31.

³⁰J. Stoetzel, "Le Prix Comme Limite," in La Psychologie E'conomique, ed. by P. L. Reynaud (Paris: n.p., 1954); D. Adam, Les Reactions du Consommateur Devant le Prix (Paris: n.p., 1958), cited by Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," p. 45.

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offers.³¹ This zone is thought to be subjective, varying in individuals and retailers, but is relatively constant with variations in price.³² Some economists also see this "zone of tolerance" extending among competitive items, creating a demand curve which is not a line but is a band.³³

Others believe the price range is sequentially determined. First a "normal" or "fair" price (which is the historic price) becomes associated with a product. In the purchase process this "normal" price is compared with an item's current price. If no difference exists, the customer is not conscious of the product as either expensive or cheap. With new products or brands, no traditional price or past reputation functions as a

³¹Bliss, "Price Determination at the Department-Store Level," p. 43; Walker, "Some Principles of Department Store Pricing," p. 529; Knauth, "Considerations in the Setting of Retail Prices," pp. 2-3.

³²The fact that this "zone of tolerance" does not apply to all customers is continually underscored by the instances most department store buyers readily recite of the customer complaints they receive that are prompted by two or three cent differentials in identical items between competitive stores. For an insightful discussion of reasons causing this phenomenon refer to: Oxenfeldt et al., Insights Into Pricing from Operations Research and Behavioral Science, pp. 85-101.

³³Peter J. D. Wiles, Price Cost and Output (Oxford, England: Basil Blackwell, 1956) cited by Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," p. 45.

standard, and the product is evaluated on the basis of its current price³⁴ along with other cues.

In the case of established products the assumption would be that the customer has a high degree of price awareness; if this were not the case the evaluative procedure would be subjective and capricious. Two widely cited studies provide some insight into the degree of price awareness which exists in the case of selected convenience items. Although the studies used different procedures, and while one study was conducted in England and the other in the United States, both found that price awareness varied greatly among items and that the difference could not be accounted for by the rate of purchase. Only when given a range of error of 5% to 10% was the rate of recall considered to be relatively high.³⁵

On the basis of these studies, it seems that even when generalizing from the situation of convenience goods (whose relatively limited absolute range of prices and rapid repurchase cycle characteristics would tend to bias the results in favor of more accurate recall) a correct

³⁴Tibor Scitovsky, "Some Consequences of the Habit of Judging Quality by Price," in Marketing and the Behavioral Sciences, ed. by Perry Bliss (2d ed.; Boston: Allyn and Bacon, Inc., 1967), pp. 444-445.

³⁵Andre Gabor and C. W. J. Granger, "On the Price Consciousness of Consumers," Applied Statistics, X (November, 1961), 263-265; "How Much Do Customers Know about Retail Prices?" Progressive Grocer, XLII (February, 1964), Gabor and Granger, "Price Sensitivity of the Consumer," pp. 40-44.

specific price may not be brought to the evaluation process for the formulation of value judgments.³⁶ One might further conclude, because price awareness appears to vary among products, that when price awareness is high the tolerable range of price variation is narrower--resulting in a greater effect for any given amount of illusion. Conversely, to the extent that price awareness encompasses a range as opposed to a point (the more realistic assumption for our purposes) the effect of any illusion is relatively weak. This is suggested because of the assumption that buyers are less responsive to differentials in price (whether actual or illusory) because of the "slack" created by this range.

Inverse Price-Volume Relationships

It has been stated previously that while odd pricing results in a demand curve which is highly elastic in the affected area, the general shape of the function is assumed to be negatively sloped. As a result, we conclude that a lower perceived price falling outside this immediate range would still increase product demand.

³⁶An exception would, no doubt, be found in the case of well established price lines which in the past would have included such items as \$2.50 neckties, and \$5.00 shirts. For an elaboration refer to: Hollander, "Customary Prices," pp. 45-56; Harper, Price Policy and Procedure, pp. 280-281.

There has been some discussion, some incidents noted, and some studies conducted that attack this assumption.³⁷

The positively sloped demand function, or the so called "Veblen effect," is well established in economics.³⁸ An extended form of the function which incorporates this phenomenon is presented in Figure 2.

While there is no evidence to support the fact that goods demonstrating this Veblen effect would behave in the manner depicted in the lower price regions of Figure 2, incorporating such an assumption highlights the Veblen

³⁷Harold J. Leavitt, "A Note on Some Experimental Findings about the Meanings of Price," Journal of Business, XXVII (July, 1954), 205-210; Donald S. Tull, R. A. Boring, and M. H. Gonsior, "A Note on the Relationship of Price and Imputed Quality," Journal of Business, XXXVII (April, 1964), 186-191; J. Douglas McConnell, "The Price-Quality Relationship in an Experimental Setting," Journal of Marketing Research, V (August, 1968), 300-303; Ben M. Enis and James E. Stafford, "The Influence of Price and Store Information upon Product Quality Perception," Journal of Southern Business, IV (April, 1969), 90-94; Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," pp. 43-70; Edward M. Smith and Charles L. Broome, "Experimental Determination of the Effect of Price and Market-Standing Information on Consumers' Brand Preferences," in Science, Technology, & Marketing, ed. by Raymond M. Haas (Chicago: American Marketing Association, 1966), pp. 520-531; Folke Olander, "The Influence of Price on the Consumer's Evaluation of Products and Purchases," (mimeograph; The Economic Research Institute at the Stockholm School of Economics, n.d.), pp. 1-43.

³⁸Robert A. Lynn, Price Policies and Marketing Management (Homewood, Illinois: Richard D. Irwin, Inc., 1967), p. 10.

phenomenon, and, at the same time, distinguishes the pattern of demand in this price region from that which will be offered in Figure 3. Under these assumptions the quantity OD is at a minimum at price OB. But the market for the item can be broadened in two ways: either by increasing the price to OC or decreasing it to OA. In the latter case, traditional theory holds that marginal customers are attracted to the product and/or existing customers are induced to purchase greater quantities because of lower prices--creating greater value because of the higher quality-price ratio. On the other hand, quantity OE could also be sold by increasing the price to OC. In this case the basis of appeal is the "prestige value" attached to the product as a result of the higher price. This exists with products which have a great deal of social visibility and evaluative content. Examples of this effect have been extensively documented.³⁹ Empirically it is also noted that the same effect occurs in the case of health and cosmetic products.⁴⁰ In this case the effect is the result of the assumed relationship between effectiveness and cost

³⁹Walker, "Some Principles of Department Store Pricing," p. 534; Gabor and Granger, "Price Sensitivity of the Consumer," p. 40.

⁴⁰Herbert W. Warden, "Making Sales Factors Work for You," Printers' Ink, CCXXCII (June 28, 1963), 24-25.

in products which are important to a person's well being, rather than the result of any prestige value.

The second case arises when a product is presumed to have a strong price-quality relationship, when the basis for the evaluation of alternative products is not readily apparent, when the products are considered to be different, when the product performs an important function, when the product involves the expenditure of substantial effort or cost to function (e.g., the classic case of automobile wax), or when the item involves a high degree of perceived risk to the buyer. Such a demand function is illustrated in Figure 3, in which demand is maximum at price OB, resulting in the sale of quantity OE. Consistent with the general assumption, if prices were increased to OC, the demand would then shrink to OD. But in this case the market for the item would not be broadened (as is generally true) if the price was reduced to OA. It would also shrink to quantity OD⁴¹ because price is used as an indicator of quality.⁴²

⁴¹A statement of this effect is offered in Gabor and Granger, "Price Sensitivity of the Consumer," pp. 40-44; Harper, Price Policy and Procedure, p. 39; Warden, "Making Sales Factors Work for You," p. 26; Knauth, "Considerations in the Setting of Retail Prices," p. 10; McConnell, "The Price-Quality Relationship in an Experimental Setting," pp. 300-303; Enis and Stafford, "The Influence of Price and Store Information Upon Product Quality Perception," pp. 90-94.

⁴²For a discussion of the problems associated with product quality definition refer to: Oxenfeldt, Executive Action in Marketing, p. 330.

Figure 2
DEMAND CURVE ILLUSTRATING VEBLEN EFFECT

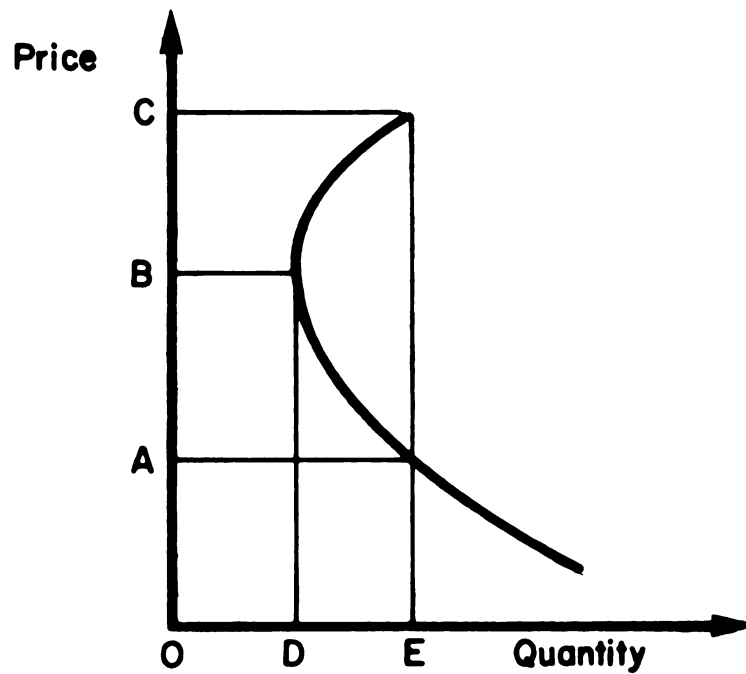
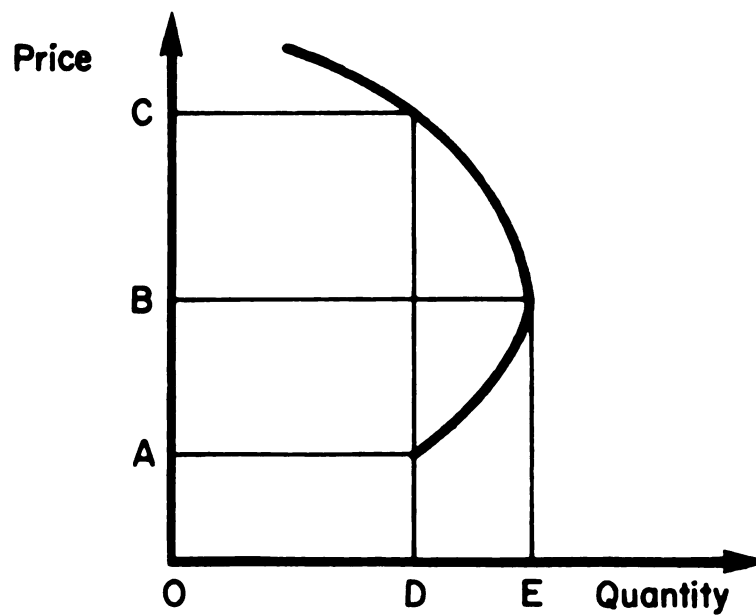


Figure 3
DEMAND CURVE ILLUSTRATING STRONG PRICE-QUALITY RELATIONSHIP



When the price of the item is reduced the customer is left with the impression that the quality and expected performance of the item may be unsatisfactory. Price functions as the overriding indicator of quality either because of the employment of simplified decision processes or, in the absence of other sign-expectancies, it serves as the only differentiating variable to relatively uninformed customers.⁴³ It has been observed that this effect is particularly strong when such deviations occur from established price points.⁴⁴

In a simulated experiment Gabor and Granger found a consistent pattern across a range of products (two categories of food products, two nondurable household items, nylon stockings, and a particular type of Wilton carpet identified by a sample). Their findings support the existence of such a backward bending slope, in the short run at least.⁴⁵ They concluded that the price effect is particularly strong for items whose product

⁴³For further discussion refer to: Edward M. Smith, "Comments on: The Influence of Price and Store Information Upon Product Quality Perception, The Southern Journal of Business, IV (April, 1969), 107-109; Scitovsky, "Some Consequences of the Habit of Judging Quality by Price," pp. 442-450.

⁴⁴P. W. S. Andrews, "Some Aspects of Competition in Retail Trade," Oxford Economic Papers, II (June, 1950), 154-155; Gabor and Granger, "Price Sensitivity on the Consumer," pp. 30-44.

⁴⁵Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," pp. 43-70.

quality can not be established by sight and when constant changes in technology and fashion minimize the carryover of previous buying experience.⁴⁶ Other studies show that customers feel certain products are subject to significant inter-brand quality differences while others are not. A strong positive price-quality relationship is found among products in the former category.⁴⁷ The existence of this inverse demand curve is also supported by two word association experiments revealing that the term "expensive," in the vast majority of instances, was associated with "high quality" or "superior."⁴⁸

Because the customer establishes the quality of a product as an outgrowth of ". . . a variety of informational inputs concerning a set of criteria he (the customer) has established for judging the product,"⁴⁹ price is but one factor in the formulation of his total impressions. On the other hand these sign-expectancies

⁴⁶Ibid.

⁴⁷Leavitt, "A Note on Some Experimental Findings about the Meanings of Price," pp. 205-210; Myers and Reynolds, Consumer Behavior and Marketing Management, p. 48.

⁴⁸Scitovsky, "Some Consequences of the Habit of Judging Quality by Price," p. 443; Meyers and Reynolds, Consumer Behavior and Marketing Management, p. 47.

⁴⁹Myers and Reynolds, Consumer Behavior and Marketing Management, p. 46.

may not be consistent and mutually reinforcing.⁵⁰ It is also reasonable to assume that sign-expectancies such as a brand's market position (although the results of a study indicated it did not have an effect)⁵¹ and a manufacturer's reputation⁵² would minimize the backward bending price curve influence by operating as a standard in the quality-price evaluation.⁵³

This seems plausible in view of the frequent situations in which private brands (which have less quality assurance associated with them) often experience large declines in volume whenever they are priced substantially below leading national brands.⁵⁴ This situation differs between new and established products or brands. In the

⁵⁰Leavitt, "A Note on Some Experimental Findings about the Meanings of Price," p. 205.

⁵¹Edward M. Smith and Charles L. Broome, "A Laboratory Experiment for Establishing Indifference Prices Between Brands of Consumer Products," in Science, Technology, and Marketing, ed. by Raymond M. Haas (Chicago: American Marketing Association, 1966), p. 513.

⁵²Meyers and Reynolds, Consumer Behavior and Marketing Management, pp. 47ff.

⁵³This view is indirectly suggested in Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," p. 50.

⁵⁴Stanley C. Hollander, "Retail Price Policies," in Readings in Marketing, ed. by Charles J. Dirksen, Arthur Kroeger, and Lawrence C. Lockley (Homewood, Illinois: Richard D. Irwin, Inc., 1963), p. 318; Walker, "Some Principles of Department Store Pricing," p. 534; McConnell, "The Price-Quality Relationship in an Experimental Setting," p. 302; Davidson and Doody, Retailing Management, p. 460.

former case, because the customer lacks a precise standard, he has little past experience to guide him and, as a result, is more inclined to use the price of the item for drawing inferences about its quality. But the quality of an established product or brand has already been determined. In this case a price reduction would not affect the item's perceived quality level; but would result in an increase in the value estimate of the item and a subsequent stimulus to sales because of the higher quality-price ratio.⁵⁵ The critical issue appears to focus on the relationship which exists between the price of the item and its perceived quality as well as the extent to which the perceived quality level is established independent of the item's price. This situation also suggests that it is not what you pay, nor what others necessarily pay, but what you think others are, or have been, paying for an item that is determining.

The case of the price-quality relationship, seemingly irrational from a typical economics perspective, does have some basis in logic. To the extent that the customer assumes price levels are established by the interplay of market mechanisms, a lower price may be interpreted as a reflection of the quality of the inputs

⁵⁵Scitovsky, "Some Consequences of the Habit of Judging Quality by Price," p. 445; Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," p. 48.

on the cost side (the assumption being that competition in the long run eliminates extraordinary profits), or as a price compensation for relative inferiority on the demand side.⁵⁶

A distinction has recently been made between the effect of the positive price-quality relationship on the perception of the product versus the product offer.⁵⁷ Because customers are inclined to use price as a cue in forming quality impressions of a product, and recognizing that these two variables may be positively related, it is generally accepted that higher prices produce a corresponding increase in the evaluation of the product. But an enhanced evaluation does not necessarily mean that the customer is more inclined to purchase the product. Rather, the prospective customer is confronted with a dilemma. On the one hand he must balance his enhanced perception of the product (resulting from the positive price-quality relationship) against the deterring influence of the higher price.

Preliminary studies were undertaken to determine the extent to which the customer trades off the two variables.⁵⁸ Although conclusive results are not

⁵⁶A related argument is offered in Scitovsky, "Some Consequences of the Habit of Judging Quality by Price," p. 443.

⁵⁷Folke Olander, "The Influence of Price on the Consumer's Evaluation of Products and Purchases," p. 44.

⁵⁸Ibid., p. 46.

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available, it is imagined that influences prompted by such intervening variables as perceived product differences, brand loyalty, subjective determinants, and exigency factors would result in a substantial variation among products. The essential point is that higher quality evaluations prompted by higher perceived prices do not necessarily result in increased sales and a positively sloped segment of the demand curve, although the effect tends to make the demand curve somewhat more inelastic. Because most studies of the price-quality relationship are solely concerned with the effect on product evaluations, it seems that there is some value in making explicit the effect of higher prices on the product and on the product offer.

Nevertheless, it appears that (given all other factors as constant) lower prices do increase sales for most products. Even in a situation suggesting the possibility of an inverse demand function, such a result occurs only when substantial numbers of prospective customers are discouraged from purchasing a product because of the deterrent effect of its lower price. But enough customers would have to be discouraged to more than offset customers switching to a product because of the attractiveness of its lower price. Given these circumstances, plus the limiting preconditions necessary to make it effective, one must conclude that the occurrence

of such a situation is unlikely although the effects of any such influence would weaken any price illusion.

The Classical Approach--Its Limitations

Traditional explanations about why the consumer behaves the way he does have been derived from economics, but for the past few years the assumptions of the classical model have been subjected to searching attacks by students of consumer behavior.⁵⁹ Because the classical approach employs a reduced form model, simplifying assumptions are made which reduce its sensitivity and predictability. Its purpose is often more prescriptive than descriptive.⁶⁰

For this reason, the traditional economic theory of buyer behavior, individually or in the aggregate, offers little promise of developing depth of understanding about the impact of price illusion or the consumer decision process. Because of its simplified structure it is mildly predictive only when behavioral extensions

⁵⁹George Katona, Psychological Analysis of Economic Behavior (New York: McGraw-Hill Book Company, 1951), chap. 4; George Katona, "Rational Behavior and Economic Behavior," Psychological Review, LX (September, 1953), 307-318; Harold H. Kassaraian and Thomas S. Robertson, eds., Perspectives in Consumer Behavior (Glenview, Illinois: Scott, Foresman and Company, 1968), pp. 2-3; Francisco M. Nicosia, Consumer Decision Processes (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966), chap. 5.

⁶⁰Alfred R. Oxenfeldt, Pricing for Marketing Executives (San Francisco: Wadsworth Publishing Company, Inc., 1961), pp. 144-145.

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are incorporated and the variables of the model are elaborated. The theory is more adequate in describing consumer actions in an economy of scarcity where basic homogeneous products, the lack of promotion, and restricted outlets create a situation of equivilency and reduce the number of salient determinants. In addition the limited buying power of consumers and the value structure in the past may further justify the emphasis given the price variable. But in terms of contemporary market realities alternative, and more realistic, schemes should be explored.

It has been suggested that in the future "internal" or emotional (as opposed to rational) buying determinants will become more significant in influencing consumer behavior. The feeling being that customers are no longer motivated by "rational economic objectives" but are almost entirely influenced by "social and psychological satisfactions."^{61,62} Although such a view is perhaps somewhat extreme, emotional factors do weigh heavily in the purchase of some items, just as rational determinants

⁶¹Cited by Myers and Reynolds, Consumer Behavior and Marketing Management, pp. 97-98.

⁶²It is stated that such views are a result of Freud's pervasive influence which contributed significantly to increased emphasis on the relative significance of extrinsic motivational or emotional factors while lessening the effect of the cognitive or rational. J. McVey Hunt, "Traditional Personality Theory in the Light of Recent Evidence," American Scientist, LIII (March, 1965), 87.

dominate in others. But because of the limited insights they provide, and the occasional situations when such determinants are influencing, the traditional economic schemes will be cited sparingly.

A Statement of Hypotheses to be Tested

The subsequent studies are designed to determine whether the following hypotheses (offered in null form) will be accepted or rejected.⁶³ There are two derivatives of the primary hypothesis which will be tested. They are:

- (1a) No significant differences in the illusion, measured by the mean value estimates of products priced at odd or even retail endings, will be found for any of the items.
- (1b) No significant differences in effect, measured by sales of each of the items priced at odd or even retail endings, will be found for any of the items.

⁶³While recognizing that statistical conventions would hold that a hypothesis is either rejected or not rejected unless a discussion of the beta error is introduced, it would appear that sufficient authoritative precedent exists to allow acceptance of the hypotheses when they are not rejected. As examples in support of this position refer to: Paul E. Green and Donald S. Tull, Research for Marketing Decisions (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966), pp. 309-312; Wilfred J. Dixon and Frank J. Massey, Jr., Introduction to Statistical Analysis (2d ed.; New York: McGraw-Hill Book Company, Inc., 1957), pp. 88-89.

Secondary hypotheses which will also be tested are:

- (2) No significant differences in purchase propensities, measured by statements of buying intent for goods priced at odd or even retail endings, will be found for any of the items.
- (3) No significant difference in the perceptions of any of the items priced at odd or even retail endings will be found.
- (4) The perceived customer roles of the subjects will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (5) The subjects' past buying experience with the product will produce no significant differences in illusion susceptibility for any of items priced at odd or even retail endings.
- (6) Indicated future purchase expectations with regard to each product will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (7) Educational levels will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.

- (8) Head of the household's occupational level will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (9) Whether the wife works or not will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (10) Marital status will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (11) Responses of various age groups will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (12) Responses of various income groups will produce no significant differences in illusion susceptibility for any of the items priced at odd or even retail endings.
- (13) No significant differences in illusion, purchase propensity, or product perception will be found within various price levels for an odd and evenly priced item.

- (14) No significant differences in illusion, buying propensity, or product perception for an item which has been priced at \$1.00, \$.98, or 98¢ will be found.

CHAPTER III

A MEASURE OF ILLUSION

The Structure of the Study

The purchase behavior process usually appears to be a single integrated act. In reality purchase behavior is the result of a complex of determinants. In order to achieve a greater understanding of the process it becomes necessary to separate the phenomenon into several discrete sub-processes. The problem then becomes one of establishing the relationships between the processes and determining their relative values. Only then can this information be restructured, combined with past information, and new knowledge and insights developed.¹

The purpose of a study does a great deal to determine the approach and the structure of each phase. But within the constraints imposed by the study's aims, some latitude is available. Recognizing that each alternative has its own advantages and disadvantages, the problem becomes one of selecting the most feasible. While the final structure of any study is often far from perfect, it should represent the best possible compromise.

¹Nicosia, Consumer Decision Processes, p. 74.

Within this context, controlled or simulated experiments offer real promise for consumer behavior studies. The most significant advantage of such studies is that the approach is relatively efficient. Such an approach does allow the study to be conducted within the usual financial constraints with a large enough sample for statistical stability.

Another important consideration is that the approach offers a high degree of control over the influencing variables. The study can be structured so that randomization is used to cancel out confounding influences that might bias or otherwise disturb the results, while maintaining close control over stimulus exposure and psychological sets. Lastly, the approach allows the generation of more information than is possible with most survey or observational approaches. This includes the substantive material relating to the study as well as the demographic information used in the classification of responses.

Artificial tests, however, are not without their limitations. Decisions made under such conditions seldom incorporate such effects as personal selling, promotions, displays, and (in our case) a "sensing" of the merchandise. On the other hand, the manipulative possibilities and the

high level of control such designs allow offer compensating advantages.²

The simulation phase of the current study involved a group-administered test. Subjects from several religious, civic, social, and fraternal organizations were gathered together and were given a questionnaire on which each item in the study was randomly priced at an odd or even ending. Subjects were immediately instructed as to the procedures necessary to satisfy the study's requirements and were asked not to discuss their responses among themselves.

During the test a black and white 35 mm. photograph or sketch of each of the eleven items included in the study was projected onto a screen while some of the significant features of the product were read. After the features were described, each subject was asked to complete a series of seven questions relating to the product. The same procedure was then followed for every other item. After this portion of the study was completed, the subjects were asked to fill out classification data.

The order of the presentation of the items was randomized between groups in an effort to control for any sequence bias. In addition, to eliminate any set bias,

²Smith and Broome, "A Laboratory Experiment for Establishing Indifference Prices Between Brands of Consumer Products," p. 159.

the price ending of each item was randomized between individuals. Furthermore, in an effort to maximize the number of useful responses, after the instructions were read a sample item (a clock radio) was projected onto the screen and the item's essential features were read to the subjects. The subjects were then asked to complete the first sequence of questions as it pertained to the sample item. Any problems, ambiguities, or misunderstandings were discussed during this time. These responses were not included in the results of the study.

Two price departures were also introduced in this phase. In the second stage of the study, one of the items (a chip and dip set) failed to produce sufficient sales for meaningful results. In an effort to gather additional information about the level of value estimates and the illusion which may exist at various price zones, this item was assigned six endings at three price levels which included: \$6.98/\$7.00; \$7.98/\$8.00; and \$8.98/\$9.00. Lastly, the lowest priced item in the study (a pint of cleaning fluid) was initially priced at: \$.98/\$1.00. Because a 98¢ expression of price may have been perceived differently, this price was included in the study, and tests across each of the endings were undertaken.

The Approach of the Test

One of the first problems to be resolved was the determination of the kinds of information that should be gathered. After considering such factors as the structure of the study, the hypotheses that were to be formulated, possible value beyond the scope of the immediate study, and the implications imposed by such factors as time, fatigue, and resources, it was decided that the basic data needed could be grouped into the following five informational areas:

1. A measure of illusion.
2. A measure of purchase propensity.
3. A measure of the perception of the product.
4. The subject's perceived buyer role, purchase experience, and anticipated needs.
5. Demographic data.

A Measure of Illusion

The responses in this area were to provide the critical measures for this phase of the study. The purpose of this portion of the inquiry was to establish whether an item with an odd price represented a better buy than the same item at an even price. While such a measure was critical to the study, the issue could not be approached directly because customers assume they are rational buyers who are not easily deceived. Any direct

inquiry would have been heavily biased in favor of responses which suggested extensive deliberation and no illusion. For this reason it was necessary to approach the problem indirectly.

After some thought it was decided that a valid indirect measure would be provided by having subjects furnish an estimate of the value represented by each of the products in the study. This was considered to be an appropriate approach in that a product's value is presumed to be a function of its perceived quality over its perceived price. More specifically, the general formula for the value of a product is assumed to be:

$$V'_i = \frac{Q'_i}{P_{i\text{e-o}}}$$

Where:

V'_i = the value estimate for product i,

Q'_i = the perceived quality for product i,

P_i = the perceived price for product i,

while P_i can be priced at an even ($P_{i\text{e}}$)
or at an odd ending (P_{i0}).

If quality and price are independent, and the odd price is perceived as being substantially lower than the even its value estimate should be significantly higher--and vice versa. Tests of significance between the mean

odd and even priced value estimates should then establish the direction and intensity of any illusion.

Illusion can be viewed as a ratio between the perceived values at the alternative prices or:

$$I_i = \frac{V'_{ie}}{V'_{io}}$$

Where:

I_i = the illusion for product i

V'_{io} = the value estimate for product i at the
odd price

V'_{ie} = the value estimate for product e at the
even price.

We would then observe that when I_i was significantly less than 1, illusion apparently exists. On the other hand, when I_i was approximately equal to 1, price illusion was not a factor. Lastly, in the event that I_i was significantly greater than 1 the assumption was that subjects' viewed quality as a positive and direct function of price; while also recognizing that illusion was strong.

We might also note that the extent of subjects' variations in value estimates for each of the items was in itself significant. When the range of dispersion was narrow, we assumed that the perceived quality estimates of the item were viewed similarly by most respondents.

But when the range was broad, it suggested that quality determinants were ambiguous, subjective, or dissimilar in other ways.

A Measure of Purchase Propensity

In addition to affording a basis for determining price illusion the subjects' value estimates provide additional information. In the first place they offer a crude indication of the item's perceived value level. While we can, by definition, assume that the higher the value estimate the more highly the item is regarded, we cannot assume that a higher estimate necessarily indicates stronger propensity to purchase. To begin with, a difference exists between the psychological commitments reflected in artificial purchase expressions and actual purchases. Researchers have recognized and cautioned against such assumptions.³ In addition, some individuals tend to be approving and supportive in such studies--which often produces a disproportionate number of higher value estimates. One can also assume that such value estimates are weakly related to relative deprivation and might, therefore, conclude that lower income and

³Howard Trier, Henry C. Smith, and James Shaffer, "Differences in Food Buying Attitudes of Housewives," Journal of Marketing, XXV (July, 1960), 69.

social class levels will assign higher values to the items.⁴

Moreover, customers are inclined to use price as a cue for establishing a product's value, so we would expect some positive covariation to occur between the two. On the other hand, we also recognize that the price of an item functions as a significant purchase determinant and is thus normally inversely related to purchase propensity. For this reason we accepted the distinction made by Folke Olander between the subject's perception of a product and a product offer, and recognize that the actual purchase decision involves a trade-off between the higher perceived value and higher price.

For these reasons it was decided that the inclusion of some direct measure of purchase propensity would be worthwhile. While recognizing that such responses would be biased upward, the relative difference would still provide a valid measure of buying preference.

⁴A plausible argument might also be made for the reverse situation. The assumption being that their lack of product experiences, and differing value orientations may influence perspectives to the extent that the items are viewed as over-priced and thus represent poor values.

The Perception of the Product

Because individuals perceive reality in different ways,⁵ it was deemed worthwhile to determine how each product was perceived by the subject, and if such perceptions were related to their value estimates. A measure of the subject's perception of a product is especially important in that the products used in the study were predetermined by constraints detailed in Chapter IV.

An Indication of a Subject's Assumed Customer Role, Purchase Experience, and Anticipated Needs

The buyer's role, purchase experience, and future needs may affect both the deliberative processes and his perception of a product.⁶ To establish a basis for analyzing this prospective influence, some indication of a subject's perceived buyer role becomes necessary. While this information is primarily intended for analysis

⁵Bernard Berelson and Gary A. Steiner, Human Behavior (New York: Harcourt, Brace & World, Inc., 1964), pp. 96-121.

⁶John S. Coulson, "Buying Decisions Within the Family and the Consumer-Brand Relationship," in On Knowing the Consumer, ed. by Joseph W. Newman (New York: John Wiley & Sons, Inc., 1966), pp. 61-64; Edmund D. McGarry, "The Merchandising Function," in Theory in Marketing, ed. by Revis Cox, Wroe Alderson, and Stanley J. Shapiro (Homewood, Illinois: Richard D. Irwin, Inc., 1964), p. 241.

of issues beyond the present study, it also provides a basis for measuring illusion susceptibility.

Demographic Information

Demographic information is an important part of almost any study. Information on such common demographic variables as age, education, and income are needed to provide a basis for the subsequent classification and analysis of results.

The Selection of Items

Details which entered into the final determination of the items to be incorporated in the study are offered in Chapter IV, but it is necessary to outline briefly the major considerations affecting the final choices. Several dimensions exist upon which an item can be classified. In order to maximize the value of this study, it was desirable to incorporate as many of these dimensions as possible in the items selected. While the results would be more valuable if these items represented only one characteristic so as to provide an unambiguous reading along each dimension, this was not possible in this case because each of the items had to satisfy a list of preconditions in order to qualify as a candidate in the second stage of the study.

The final items selected reflect a compromise, therefore they do not represent "pure" forms, nor are

they are broadly representative as we would have preferred. A further complication occurs because no two individuals perceive products in the same light. As an example, a luxury item to one person may be a necessity to another. In addition, there exists some overlap between common product concepts. For example, what may be defined as a luxury item may, to some extent, also qualify as a shopping item. Because of this, definition and classification problems arise. The issue involves establishing the product concepts which should be used for identification and determining the extent to which each of the items reflects the selected characteristics of these concepts. Without some objective basis for determining the classification of each item the procedure may become arbitrary. Additionally, if we knew how an item was perceived by a customer, some worthwhile insights into his actions could be gained.⁷

Establishing a Measure of Product Perception

Alternative Approaches to the Problem

Attitude scaling offers many alternatives for effectively measuring a customer's perception of a

⁷A somewhat related statement in this regard is made in: Nocosia, Consumer Decision Processes, p. 139.

product.⁸ Each alternative, in turn, has its relative advantages and disadvantages.⁹ After some consideration (primarily assessing Thurstone's differential scale and Likert's summated scale--each of which appear to be highly feasible) a decision was made to select the semantic differential scale for this purpose.¹⁰

Some of the more important considerations influencing this decision also account for the growing popularity of the approach.¹¹ These advantages have been detailed by Mindak and include:

1. It is quick, efficient, and indicates the direction and intensity of the various opinions and attitudes.
2. It is comprehensive in the picture it provides.
3. It is a standardized approach for getting at the multitude of influencing factors.

⁸As an example of these alternatives refer to: Green and Tull, Research for Marketing Decisions, pp. 193-211.

⁹For an extended discussion of such advantages and disadvantages refer to: Claire Selltitz, et al., Research Methods in Social Relations (2d ed.; New York: Holt, Rinehart and Winston, 1959), pp. 362-382.

¹⁰For an excellent listing and discussion of the criteria necessary for a measuring instrument refer to: Charles E. Osgood, George J. Suci, and Percy H. Tannenbau, The Measurement of Meaning (Urbana, Illinois: University of Illinois Press, 1957), pp. 11ff.

¹¹Green and Tull, Research for Marketing Decisions, p. 202.

4. It has proven to be reliable and is repeatable.
5. It avoids stereotyped responses and allows individual frames of reference.
6. It eliminates the problem of question phrasing.¹²

For our purposes there were three overriding considerations which strongly influenced the final decision. First was its proven reliability.¹³ In addition, the semantic differential is relatively easy (as compared with the Thurstone scale) to construct. But perhaps the most significant factor is its flexibility.¹⁴ Because the scales can accommodate almost any concept,¹⁵ the semantic differential is appropriate for use across a range of products and product concepts. After analysis and interpretation, the results can be used in several ways; values of the individual scales can be added and a summated score derived; profiles can be established for each of the concepts and alternative profiles compared,

¹²William A. Mindak, "Fitting the Semantic Differential to the Marketing Problem," Journal of Marketing, XXV (April, 1961), p. 29.

¹³Mindak, "Fitting the Semantic Differential to the Marketing Problem," p. 28; Selltitz, et al., Research Methods in Social Relations, pp. 382-383.

¹⁴Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 76.

¹⁵Selltitz, et al., Research Methods in Social Relations, p. 380.

or summated scores can be calculated for the factor subgroups.¹⁶

Use of the Semantic Differential Scale

In an effort to balance and extend the scope of the study it was proposed that a list of ten universal, bipolar terms that effectively measures the significant characteristics of the most common concepts used in marketing should be established. During the administration of the test, each of the subjects would then be asked to indicate his perception of each of the products on this list of scales. Each of the scales would then be used to establish the perceived dimensions of products which may have been affected by odd or even retail price endings.

The Approach Used in Scale Construction

The Product Concepts

The term concept as it is used by Osgood is very loosely interpreted to include any object or abstraction measured by the scale. For our purposes a more restrictive definition is needed. While Osgood officially defines a concept as any ". . . 'stimulus' to which the

¹⁶Selltiz, et al., Research Methods in Social Relations, pp. 380-382; Osgood, Suci, and Tannenbaum, The Measurement of Meaning, pp. 88-93.

checking operation is a terminal 'response,'"¹⁷ our definition of the term views a concept in the more traditional sense as a basis upon which groups of products may be classified. As a result, we are able to distinguish between a product and a product concept.

The product concepts used in the development of these ten universal dimensions are by nature vague. A survey of marketing tests in fact indicated that these concepts are defined in various ways. In addition, the definitions of some of the concepts have been topics of a rather extended discussion in marketing literature.^{18,19} The introduction of new terms, definitions, and qualifications further contributes to the confusion. Unfortunately, most of the concepts used are not included in the terms submitted by the American Marketing Association's committee on definitions,²⁰ which would have helped crystalize their meaning. As a result, many of the

¹⁷Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 77.

¹⁸As an example refer to: Louis P. Bucklin, "Retail Strategy and the Classification of Consumer's Goods," Journal of Marketing, XXVII (January, 1963), 50-55; David J. Luck, "On the Nature of Specialty Goods," Journal of Marketing, XXIV (July, 1959), 361-364.

¹⁹For an additional insightful discussion into the issue refer to: Oxenfeldt, Executive Action in Marketing, pp. 408-409.

²⁰Committee on Definitions, Marketing Definitions: A Glossary of Marketing Terms (Chicago: American Marketing Association, 1960).

proposed concepts failed to provide precise, authoritative, and widely accepted definitions. This is particularly acute because many of the more meaningful concepts evolved from terms developed in related areas--particularly economics and sociology. The transition caused vague and ambiguous interpretations.

In approaching the problem the first step was to gather from the leading marketing texts a list of all possible product concepts. These were listed horizontally across the top of a page. The products included in the study were listed vertically on the same page so as to create a product-concept matrix. The products in the study which were subjectively assumed to be embraced by any of the concepts were then checked. Those concepts (with the exception of "specialty good," which was included because of its academic value) which did not apply to any of the products or those which were significantly overlapped by another concept were eliminated. Some exceptions were also made, for example, a fashion good often falls into the shopping goods classification, but because the former term has a more restrictive meaning (i.e., all shopping goods are not fashion goods) it was included. As a result, the final list of product concepts was eventually reduced to:

- a. convenience good
- b. fashion good

- c. impulse item
- d. luxury good
- e. necessity
- f. novelty item
- g. shopping good
- h. specialty good
- i. status good
- j. utilitarian good/item

The Selection of the Bipolar Terms

Underscoring the importance of this part of the study is Osgood's statement that,

the crux of the method . . . lies in selecting the sample of descriptive polar terms. Ideally, the samples should be as representative as possible of all the ways in which meaningful judgments can vary, and yet be small enough in size to be effective in practice. ²¹

In treating this subject, Osgood offers three criteria for the selection of terms. His most significant points are: factorial content, relevance to the concepts which are to be judged, and the semantic stability of the terms to be measured across product concepts and individuals.²² These criteria can be easily justified. Failure to include the significant dimensions

²¹Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 20.

²²Ibid., pp. 78-80.

of a concept could either distort perceptions or furnish a partial item profile. On the other hand, an irrelevant scale would result in a substantial number of neutral judgments²³ which would limit the amount of information furnished by a given number of scales.²⁴ Lastly, if the meanings attached to the scales varied significantly among concepts, products, or individuals, the result would be a range of responses which bear little relationship to one another.

The next step was to select the number of scales to be used in the study. Osgood says that as each judgment serves to localize a concept in semantic space, the larger the number of scales (and the more representative they are) the greater the validity with which the concept is represented.²⁵ On the other hand, there were constraints imposed by the physical limitations demanded by the study. Because the semantic differential scale must be completed for each item in the study, the addition of one scale would extend the total number of responses required of each subject by a factor of twelve; therefore, it was felt that approximately ten carefully

²³Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1965), p. 570.

²⁴Osgood, Suci, and Tannenbaum, The Measurement of Meaning, pp. 78-79.

²⁵Ibid., p. 26.

selected scales would offer an appropriate compromise between the physical demands of the study and yet produce an adequate item profile. Furthermore, this constraint imposes strong pressures to produce a balanced list of meaningful, commonly understood, and unambiguous scales.

In selecting possible scales, Osgood offers a list of fifty bipolar adjective pairs whose factor loading and purity across the range of concepts has already been established.^{26,27} While it would be tempting to draw from these, we recognized that, above all, the terms in the study must be appropriate to the concepts. First, we recognized that the product concepts we intended to use were vague, poorly defined, and ambiguous to even the most informed students of marketing. Furthermore, the subjects of the study would be asked to apply the final scales across a range of disparate products. Lastly, these adjectival pairs, particularly those offered by Osgood, were developed to apply across the widest possible range of concepts. As a result, the adjectives offered by him are more basic and generalized--adding an

²⁶Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 37.

²⁷In addition to this list offered by Osgood, there are other pretested lists of adjective pairs which are intended to use in any number of measurement situations. As an example refer to: William D. Wells, et al., "An Adjective Check List for the Study of Product Personality," Journal of Applied Psychology, XLI (October, 1957), 317-319.

additional degree of abstraction. Although we incorporated several varied concepts in this study, the range is still more limited than that visualized by Osgood. Therefore, given the specific scope of the study, the value of meaningful scales, and the limits imposed by the number of scales that could be used, it would appear that the construction of scales appropriate to the unique needs of the study was justified.

The next step was to determine which of the product dimensions would furnish possible bases for classification. This was accomplished by first going to the current general marketing texts. These texts were checked to determine which product dimensions were thought to be significant by the respective authors.²⁸ These characteristics were converted into two opposing phrases which, it was subjectively felt, adequately spanned each of the product dimensions. This approach initially yielded 68 pairs of bipolar terms to be used in the next phase of the study.

Two comments might be made concerning the changes which were made. As constructed by Osgood, the semantic differential scale utilizes bipolar adjectival pairs.

²⁸Texts that were particularly helpful in this regard were: McCarthy, Basic Marketing: A Managerial Approach, chp. 14; William J. Stanton, Fundamentals of Marketing (New York: McGraw-Hill Book Company, 1964), pp. 132ff.

But adjectives are often more general than compound terms or phrases. Descriptive nouns and qualifiers were incorporated in the scales because they add precision and develop shades of meaning which are not available from the use of adjectives²⁹ alone.

Furthermore, the use of extreme bipolar terms would cause a clustering of responses in the center of the scale. The effect would be to reduce discrimination and in this way limit the sensitivity of the scale and the ultimate value of the study. Therefore, to achieve a greater measure of discrimination, polar terms were avoided when possible, and an attempt was made to incorporate terms that suggested relevant segments of the product dimensions.

The next step involved translating the formally stated dimensions into more generally understood statements having the same denotation. To accomplish this, six housewives were assembled. Care was taken to draw candidates with varied backgrounds, educational levels, and subjectively imputed intelligence. In addition, the author, who conducted the session, was acquainted with all of the housewives and each participant knew one or two of the other members. This was considered

²⁹Mindak, "Fitting the Semantic Differential to the Marketing Problem," pp. 28-33; G. David Hughes, "Selecting Scales to Measure Attitude Changes," Journal of Marketing Research, IV (February, 1967), 85-87.

important in order to encourage broad participation and to facilitate involvement by the more reticent and less secure participants.

During the session, the purpose of this study was outlined. Each pair of terms as originally phrased was offered to the members, who were asked to translate these statements into equivalent vernacular terms. In the process, additional pairs of phrases which covered the same dimensions were generated and some retained, while other overlapping or otherwise inappropriate terms were eliminated. The end product of this effort was to compress the original sixty-eight pairs of bipolar terms into forty-two scales.

Next, approximately half of these terms were randomly reversed and the original list was randomly re-ordered. This revised order of scales was reproduced on a sheet using a standard seven-interval semantic differential format.³⁰ These sheets were headed with one of the ten product concepts selected earlier. Each of these concept sheets was then combined in a questionnaire containing one of each of the ten product concepts in a unique random order. Twenty-seven such questionnaires were assembled.

³⁰A copy of this initial list is offered in the Appendix.

These questionnaires were administered to a group of twenty-seven junior, senior, and graduate marketing research students. The purpose was to isolate those scales which were most applicable across the ten product concepts, and to establish some measure of consensus among the subjects.

In a previous discussion we touched upon some indicators which would reveal terms that most effectively describe each of the product concepts. Kerlinger states that one cannot always be certain which terms are meaningful to a concept, therefore any selection of scales requires an objective approach.³¹

An additional criterion added to our selection of alternatives was the factorial composition of the scales. "Factor structure," (or "factor content," as used by Osgood) is intended to represent related clusters which compose independent subsets of the product concepts.³² Osgood established that by summing over concepts the majority of meaningful judgments can be embraced by activity, evaluative, and potency dimensions.³³ Although it is recognized that other factors contribute to meaningful judgments, the three listed above were

³¹Kerlinger, Foundations of Behavioral Research, p. 570.

³²Ibid., pp. 570-571.

³³Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 51, passim.

established as the most significant. While the relative significance of each of these factors varies among concepts, a general order appears to exist.³⁴ Osgood's studies indicate that the evaluative factor generally accounts for one-half to three-quarters of the extractable variance, the potency factor typically accounts for about half that of the first, and the activity factor is generally equal to or is slightly smaller than the second.³⁵

It appeared that factors offered by Osgood were too general to assure appropriate balance for the product concept dimensions which we revealed. For example, he found that scales defined as evaluative included more specific sub-factors such as those which are morally, esthetically, socially, or emotionally evaluative.³⁶ For this reason, the absence of more definitive factors could result in overweighing some specific dimensions and still not assure one of having all concept dimensions represented. These considerations led to the use of an analysis of the factor content across the product concepts in determining the make-up of the final set of scales.

³⁴Ibid., pp. 71-72ff.

³⁵Ibid., p. 71, passim.

³⁶Ibid., pp. 70-71.

Factor Analysis

Factor analysis has many possible applications,³⁷ but in this study it was undertaken for four essential purposes:

1. To determine objectively the number of factors that underlie the range of product concepts selected.
2. To determine the scales which are loaded on these factors.
3. To establish the magnitudes of these loadings.
4. To establish the relative importance of each of the factors.

Several possible approaches to factor analysis exist. Although Osgood elected to use the popular centroid rotation method, this did not prove to be the best approach for our purposes. Commenting on the limitations of the method Kerlinger said:

The increasing accessibility of high speed computers and computing programs for factor analysis is making some of the methods obsolete. Thurstone's well-known centroid method, for example, will in a few years probably be little used. It is a computational compromise, as Thurstone said, to avoid the excessive computational labor of more satisfactory solutions. It will no doubt be replaced in time by the principal factors and

³⁷As an example refer to: William F. Massy, "Applying Factor Analysis to a Specific Marketing Problem," in Toward Scientific Marketing, ed. by Stephen A. Greyser (Chicago: American Marketing Association, 1963), pp. 291-307.

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other mathematically and statistically more satisfying methods.³⁸

Thurstone, in fact, strongly endorses the use of the principal factors approach and offers the following as a guide: ". . . the principle-axis (factors or components) solution is the ideal solution for the problem of statistical compensation of the test (item) scores into the smallest possible number of factors. . . ." but adds the additional qualification that ". . . this solution (the product of principal-axis method) is inadequate for the analysis of the underlying processes and their identification."^{39,40}

On the basis of such statements it was concluded that the principal factors method promised the most satisfying results, and should be the approach used. An appropriate principal factors program was subsequently found in the IBM scientific sub-routine package,

³⁸Kerlinger, Foundations of Behavioral Research, p. 659.

³⁹L. L. Thurstone, Multiple-Factor Analysis (Chicago: University of Chicago Press, 1947), p. 509 and pp. 503-506.

⁴⁰For a brief discussion of the differences between the centroid and principal factors approaches refer to: Philip H. DuBois, An Introduction to Psychological Statistics (New York: Harper and Row, 1956), pp. 464-465; and Thurstone, Multiple-Factor Analysis, chps. 5, 7.

although the computer limitations were such that it could accommodate only twenty-five variables.⁴¹

The Variable Reduction Process

Because of this limitation, it was necessary to establish an objective procedure for reducing the initial forty-two variables to twenty-five. In approaching this problem, all responses to the product concept pre-test which used the forty-two variables were quantified by assigning each response a number from one to seven to represent the indicated scale position. Each of these response values for the forty-two variables were then fed into the computer by subject and concept. Then summing across subject and concept, Pearson product moment correlations of each scale with every other scale were computed.⁴²

The result produced a forty-two by forty-two R-matrix which was subsequently analyzed for scales evidencing a high degree of intercorrelation. To start, an arbitrary level of $r = \pm .600$ was considered sufficiently high to qualify any variables for elimination. Conversely, any scales which were not correlated with other

⁴¹This program is detailed in: BDM Computer Programs Manual, ed. by William J. Dickson (Los Angeles: University of California Press, 1964).

⁴²This is essentially the same approach offered in Osgood, Suci, and Tannenbaum, The Measurement of Meaning, pp. 35-36.

variables at the level of $r = \pm .600$ were considered sufficiently independent to be included in the list of factor analysis variables. There were sixteen such independent variables. The list of scales which satisfied the independence criterion is offered in Table 1.

In the case of the remaining twenty-six variables, forty-two intercorrelations were produced in which $r > \pm .600$. These results are offered in matrix form in Table 2. From this matrix, intercorrelations between the variables were charted to develop networks of intercorrelations which would delineate any existing clusters.

After the networks were charted, the first criterion in the selection of the final variables was direct intercorrelation between selected variables and all non-selected variables. As an additional condition, to maximize independence it was necessary that no two final variables selected should be intercorrelated with any other cluster at a level greater than $\pm .600$. Because the objective was to achieve the lowest possible intercorrelations between the selected variables, it might be noted that of the 600 possible intercorrelations produced by the final twenty-five selected variables, 573 had r -values of less than $\pm .500$. When a choice had to be made between intercorrelated variables, the one with the smaller standard deviation was selected. It was

TABLE 1.--Independent variables reflecting no inter-relationships where $r > \pm .600$.

Variable	Highest r
1. Recommended by friends--Own opinion most important	-.361
2. Specific use--No need in mind	-.530
3. Practical--Stylish	.574
4. Reduces worries--No effect	.391
5. Seldom bought--Often bought	.556
6. Other's opinion unimportant--Other's opinion important	-.501
7. Price no object--Price buyer	.481
8. Sold in few stores--Sold in many stores	.595
9. Item important--Price important	.329
10. Not influenced by salesman--Influenced by salesman	-.366
11. Price unimportant--Shop price	.481
12. Urgent purchase--Postponed purchase	-.476
13. Brand important--Features important	.507
14. Seen by few--Seen by many	-.161
15. Popular opinion important--Expert's opinion important	.454
16. Looks just like me--No personality	.544

TABLE 2.--Symbolic representation of experimental design
(treatments are shown in subscripts and parentheses).

Store	Weeks				Store treatment total A	Store treatment total B	Store total	
	1	2	...	j				
1	x	(A) $X_{\Delta 11}$	(B) $X_{\Delta 12}$	...	(B) $X_{\Delta 1j}$	$\Sigma(A)X_{a1.}$	$\Sigma(B)X_{b1.}$	$\Sigma \Sigma X_{.1.}$
	y	(A) $Y_{\Delta 11}$	(B) $Y_{\Delta 12}$	...	(B) $Y_{\Delta 1j}$	$\Sigma(A)Y_{a1.}$	$\Sigma(B)Y_{b1.}$	$\Sigma \Sigma Y_{.1.}$
2	x	(B) $X_{\Delta 21}$	(B) $X_{\Delta 22}$	...	(A) $X_{\Delta 2j}$	$\Sigma(A)X_{a2.}$	$\Sigma(B)X_{b2.}$	$\Sigma \Sigma X_{.2.}$
	y	(B) $Y_{\Delta 21}$	(B) $Y_{\Delta 22}$	...	(A) $Y_{\Delta 2j}$	$\Sigma(A)Y_{a2.}$	$\Sigma(B)Y_{b2.}$	$\Sigma \Sigma Y_{.2.}$
...	
	
i	x	(B) $X_{\Delta i1}$	(A) $X_{\Delta i2}$	...	(A) $X_{\Delta ij}$	$\Sigma(A)X_{ai.}$	$\Sigma(B)X_{bi.}$	$\Sigma \Sigma X_{.i.}$
	y	(B) $Y_{\Delta i1}$	(A) $Y_{\Delta i2}$	...	(A) $Y_{\Delta ij}$	$\Sigma(A)Y_{ai.}$	$\Sigma(B)Y_{bi.}$	$\Sigma \Sigma Y_{.i.}$
Weekly total A	x	$\Sigma(A)X_{a.1}$	$\Sigma(A)X_{a.2}$	...	$\Sigma(A)X_{a.j}$	$\Sigma \Sigma(A)X_{a..}$		
	y	$\Sigma(A)Y_{a.1}$	$\Sigma(A)Y_{a.2}$	...	$\Sigma(A)Y_{a.j}$	$\Sigma \Sigma(A)Y_{a..}$		
Weekly total B	x	$\Sigma(B)X_{b.1}$	$\Sigma(B)X_{b.2}$	...	$\Sigma(B)X_{b.j}$		$\Sigma \Sigma(B)X_{b..}$	
	y	$\Sigma(B)Y_{b.1}$	$\Sigma(B)Y_{b.2}$	...	$\Sigma(B)Y_{b.j}$		$\Sigma \Sigma(B)Y_{b..}$	
Weekly total	x	$\Sigma \Sigma X_{..1}$	$\Sigma \Sigma X_{..2}$	...	$\Sigma \Sigma X_{..j}$			$\Sigma \Sigma \Sigma X_{...}$
	y	$\Sigma \Sigma Y_{..1}$	$\Sigma \Sigma Y_{..2}$	...	$\Sigma \Sigma Y_{..j}$			$\Sigma \Sigma \Sigma Y_{...}$

Where:

A = Merchandise marked at odd retail price endings.

B = Merchandise marked at even retail price endings.

X = Merchandise available for sale for week.

Y = Net sales for week.

Δ = Individual treatment assignments which are randomly determined until $j/2$ or $i/2$ is reached by either treatment A or B.

felt that the criterion suggested by Osgood of rejecting mean values approaching the midpoint, was inappropriate when summing across concepts.

Nine additional scales were selected which satisfied these criteria. These were then added to the original sixteen variables to produce the necessary twenty-five. (The nine additional variables selected by the use of these criteria are indicated in Table 2).

The Factor Analysis Results

In the factor analysis procedure, responses to the twenty-five variables were again summed across subject and concept. While it is recognized that the factorial composition of any variable might vary substantially among concepts,⁴³ our purpose was to isolate factors across the range of selected product concepts. For this reason the approach was deemed to be appropriate.⁴⁴

The purpose at this juncture was to extract the common factor variance among the variables and to determine the components underlying this variance. Other points of interest arising from this analysis were: how much of the variance was explained by the program,

⁴³Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 74, p. 100.

⁴⁴Ibid., p. 35.

the number of factors produced, the relative variance accounted for by each factor, and the loadings of the variables on each factor. The results of the analysis revealed the existence of five factors with the results offered in Table 3.

TABLE 3.--Program factor values.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Eigenvalues	5.4935	4.1403	2.0778	1.5923	1.1521
Cumulative percentage of eigenvalues	21.97%	38.54%	46.85%	53.22%	57.82%
Percentage of total explained variance	21.97%	16.56%	8.31%	6.37%	4.81%
Percentage of ex- plained common factor variance	38.00%	28.64%	14.37%	11.02%	7.97%

The resulting rotated matrix of the program produced the variable loadings for each of the factors which are listed in Table 4.

Because the proportion of variance explained by the factors was relatively high ($n^2 = .5782$), the results were gratifying. This left a relatively small proportion of unique and error variance ($u^2 = .4218$). It would seem that these values justified pursuing the approach further.

TABLE 4.--Matrix of variables with r values greater than $\pm .600$.

Variable	Variable numbers																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
1. One brand is as good as another-The only brand I would ever use										.745	-.645			.604			-.695					.640					
2. See it advertised-Substituted				.629																							
3. Expensive-Expensive*	.637																										
4. Widely advertised-Where prices are		.629												.694	-.700							.610					
5. Expensive purchase-Expensive purchase						-.695	-.721	-.775												-.647					.700		
6. I looked all over before deciding-I bought the first place I looked					-.695																						
7. Complete information-Expensive purchase					-.721	.705	.645													.784		.620			-.640		
8. Planned purchase-Expensive purchase					-.775	.645	.753													.682					-.754		
9. All brands are the same-All brands are different	.745									-.625		.612															
10. Brand important-Brand unimportant	-.645									-.625							.718				-.602						
11. Calculated purchase-Rational purchase																				.616							
12. Brands similar-Brands different										.612																	
13. Status item-Status unimportant		.694																									
14. Sold at discount stores-Sold at "better" stores	.604	-.700																									
15. Unnecessary purchase-Brand purchase																				-.712						.691	
16. Brand loyal-Brand unimportant	-.694									-.620	.718																
17. Dealer's service important-Dealer's service unimportant																		.647		.648							
18. Durable item-Frequent replacement																		.647		.632							
19. Necessary purchase-"Push" purchase																										-.785	
20. I checked all over before deciding-I bought the first place I looked					-.647	.786	.725	.682							-.712		.648	.632						-.680	-.677		
21. One brand works as well as another-They are all different	.640									.677	.602																
22. Maximum quality-adequate quality		.610																								-.640	
23. It doesn't pay to compare-Comparison shop																										-.677	
24. Spec-of-the-moment purchase-Specific item in mind					.700										.691											-.707	
25. Previous-Necessary																											
26. Useful-Pleasurable																											

* Variable selected for use in factor analysis program.

Establishing Factor
Dimension

An analysis of the individual factors proved to be of some interest in its own right. Bearing in mind that the results of any factor analysis are tentative (because the variables included in the study are seldom exhaustive and as a result any factors that are derived would differ between samples and conditions and that the principle axis method does not ideally lend itself to the identification of component factors,⁴⁵ it still seemed worthwhile to label each of the factors which were isolated.

In approaching this problem, another arbitrary cut off of variables having loadings of approximately $\pm .600$ on any factor was established. Using this criterion, the variables offered in Table 5 proved to be most heavily loaded on each of the five factors.

The next problem was to establish a denominator for each factor. It appears that the factor common to the variables in the first group was in some way related to the shopping effort. In the two cases of the "expensive-inexpensive" and the "durable item-frequent replacement" variables, although the relationship is indirect, they are positively related to shopping effort.

⁴⁵Kerlinger, Foundations of Behavioral Research, p. 683.

TABLE 5.--Factor-variable-clusters.

Factor Loadings	Variables
<u>FACTOR 1</u>	
.606	Expensive-Inexpensive
.764 ^a	Planned purchase-Impulsive purchase
.753 ^a	Calculated purchase-Habitual purchase
.766 ^a	Durable item-Frequent replacement
-.719 ^a	It doesn't pay to compare-Comparison shop
<u>FACTOR 2</u>	
.693 ^a	Practical-Stylish
-.590	Seldom bought-Often bought
-.820 ^a	Unnecessary purchase-Urgent purchase
.592	Urgent purchase-Postponed purchase
.739 ^a	Useful-Pleasurable
<u>FACTOR 3</u>	
-.689 ^a	Recommended by friends-Own opinion most important
.680	Other's opinion unimportant-Other's opinion important
.642	Not influenced by salesman-Influenced by salesmen
<u>FACTOR 4</u>	
.761 ^a	Price no object-Price buyer
.683	Item important-Price important
.590	Price unimportant-Shop price
<u>FACTOR 5</u>	
.726	Widely advertised-Never promoted
-.653 ^a	Seen by few-Seen by many

a = Final variables selected

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This seems plausible in that the subjects would be inclined to believe that the more expensive the item, the greater the deliberation in the purchase decision. The relatively low intercorrelation of these variables with the price factor (i.e. factor four) serves to further support this view. Although the relationship between shopping effort and the "durable item-frequent replacement variable," is also indirect, it is well accepted and established in marketing literature. With such considerations in mind, it was felt that this factor was embraced by what could be viewed as the search-evaluation dimension. We might also note that this dimension furnishes the most important basis for distinguishing various product concepts; accounting for almost 40% of the explained common factor variance.

Following through in essentially the same way, it was decided that the next factor (accounting for about 29% of the common factor variance) incorporated a need-exigency dimension. Factor three was felt to embrace an influence-authority dimension. Factor four was highly correlated with price variables, and factor five appeared to represent a visibility-exposure dimension. A point in this regard was that the price dimension appeared to be a relatively unimportant factor in distinguishing product concepts--explaining slightly more than one-tenth the common factor variance.

The Selection of the Final Variable

Because factor loading is a measure of the correlation between a variable and a factor,⁴⁶ the selection of the final variables was relatively simple since the scales with the highest loadings are the variables which best represent each factor. But some consideration also had to be given to those variables which are factorially "pure" and factorially "complex."⁴⁷ It would appear that the selection of factorially "pure" variables was particularly important in our situation where an attempt was being made to represent each factor in a rough relationship to its proportion of the explained common factor variance. To disregard this point would, to some degree, disturb this balance. Therefore, the criteria for the selection of the final list of variables was two-fold; that the variables should have either a high positive or negative loading on the factor, and that they have relatively low loadings on the other four factors.⁴⁸

The next problem was to determine how many variables should be used to represent each factor. In the

⁴⁶DuBois, An Introduction to Psychological Statistics, p. 458.

⁴⁷For a discussion of the distinction between the two refer to: Kerlinger, Foundations of Behavioral Research, p. 652.

⁴⁸The use of this factorially "pure" criterion is supported in a discussion by Osgood, Suci, and Tannenbaum, The Measurement of Meaning, p. 78.

construction of a test, Osgood suggests that about three sets of scales should be used for each factor, and further justifies this by claiming that:

What we do is to provide the subject with a balanced space which he may actually use as he sees fit; if he makes more discriminating use of the evaluative factor relative to others this will show up in this data (in the elongation of his space along this dimension) but he is not forced by the sample of scales to do this.⁴⁹

A decision was made to depart from the use of balanced factors as suggested by Osgood. This was done for two reasons. First, we are not interested in factor scores, as was Osgood.⁵⁰ While the reliability and the representativeness of such scores is enhanced by increasing the number of variables representing each factor, in our case we had a large number of factors which would substantially increase the number of scales required. Additionally, if a meaningful summated score is wanted which uses a D-statistic derived across all variables, a balanced number of scales allows this to be done without undertaking an elaborate series of additional computations.

The second reason for the departure arises from the tentative nature of the factors. These factors were developed from a single homogeneous group of subjects

⁴⁹Ibid.

⁵⁰Ibid.

who were responding to an enlarged list of variables.⁵¹ In effect, the number, composition, and relative significance of these five factors is subject to change with the inclusion of a broader and more exhaustive list of variables or a larger and more heterogeneous group of respondents. Because these results do offer the best approximation we have in an area of great uncertainty, to deviate in any way from them would arbitrarily compound any error which might exist.

With these considerations in mind it was decided that the number of variables selected to represent each factor should bear some relationship to the factor's percentage of explained common factor variance. As a result, four factors were selected to represent factor 1, three for factor 2, and one each for factors 3, 4, and 5. The percentage of the explained common factor variance was 38.0%, 28.6%, 14.3%, 11.0%, and 8.0% respectively (refer to Table 3).

With the three criteria of high factor loading, factor "purity," and representation of factors in relationship to percentage of explained common factor variance in mind, variables 7, 11, 16, and 21 were selected

⁵¹The implicit assumption being that the fatigue effect resulting from the demands of 420 individual responses (10 concepts x 42 scales) required of each subject would increase the amount of error variance and thus minimize the common factor variance.

to represent factor 1 in the final list; variables 5, 15, and 25 to represent factor 2; variable 2 for factor 3; variable 12 for factor 4; and variable 22 for factor 5 (refer to Table 4).

After selecting the variables they were rearranged in random order. This final list was then incorporated as the final question in the questionnaire for use in this phase of the study.

The Questionnaire Development

The final form of any questionnaire is the end product of several revisions. Among the topics considered in the early formulation of the questionnaire, which would provide bases for subsequent analysis, were responses indicating the subject's:

1. Value estimates of the product.
2. Purchase experience and anticipated needs with regard to the product.
3. An indication of each subject's perceived buyer role.
4. An indication of each subject's purchase propensity.
5. Indications of each subject's product perceptions as measured on the semantic differential scales.
6. Demographic data.

Several possible scales suggested themselves for measuring value and buying propensity. Some considerations in the final selection were the scale's ability to discriminate and the ease with which the scale could be understood by subjects with diverse backgrounds. Furthermore, an equal interval scale was preferred because it would eliminate a midpoint. This would force choices, which would minimize any halo effect and result in a greater measure of dispersion. After considering several possibilities, a ten-point, poor-to-excellent scale seemed to offer the greatest promise for measuring value estimates.⁵² In addition, a five-interval descriptive scale was initially devised to measure estimates of the subject's buying propensity because the response requires a great deal of conjecture and subjects' views would be relatively imprecise. It was thought that the use of a scale with a greater number of response alternatives would simply confuse any valid expression of purchase propensities.

It was also felt that direct questions would provide valid responses to topics two, three, and six. In the case of topic five, no reason could be found for

⁵²William H. Reynolds, "Some Empirical Observations on a Ten-Point Poor-to-Excellent Scale," Journal of Marketing Research, III (November, 1966), 388-390.

departing from the standard seven-interval scale recommended by Osgood.

A dilemma confronts the researcher involved in establishing demographic classifications for a study. On the one hand, the value of using a standard basis of classification was recognized;⁵³ particularly in making research results cumulative. On the other hand, the unique subject, purpose, and sample of each study often requires that adjustments in standard classifications be made.⁵⁴ Because of the limitations, requirements and purpose of the study, some adjustments were made. While the demographic breaks generally follow the revised recommendations of the Research Committee of the American Association of Advertising Agencies,⁵⁵ the suggested occupational classifications were rejected in favor of a modification of the factor analyzed group established by Carman.⁵⁶ In the modification process, Carman's basic

⁵³For a discussion of the issue refer to: "Standard Breakdowns for Population Data," Journal of Marketing, XV (April, 1951), 476-478; William M. Weilbacher, "Standard Classification of Consumer Characteristics," Journal of Marketing, XXXI (January, 1967), 27-31.

⁵⁴Harper W. Boyd, Jr. and Ralph Westfall, Marketing Research (rev. ed; Homewood Illinois: Richard D. Irwin, Inc., 1964), p. 246.

⁵⁵Weilbacher, "Standard Classification of Consumer Characteristics," pp. 29-31.

⁵⁶James M. Carman, The Application of Social Class in Market Segmentation (Berkley, California: University of California, Berkley Institute of Business and Economic Research, 1965), pp. 43-48.

16 occupational groups were reduced to seven (which simply involved aggregating groups of related classifications), while separate retiree and student categories were also included.

Early questionnaires were presented to selected individuals for suggestions,⁵⁷ and a preliminary form was produced for the pretest. At this time one basic addition was made. Another ten-point scale, such as that used for gathering data on value estimates, was included to solicit item quality estimates. The data generated by the question are primarily intended for the study of issues independent of the price-illusion question. Lastly, it was felt that more valid responses to topics two and three and the quality estimate could be gathered by requiring a response before the subject was exposed to the price variable. As a result, a two-page questionnaire was devised and questions pertaining to topics two, three, and the quality estimate were included on the first page, while questions relating to the value estimates, buying propensities, and product perceptions were listed with the price variable on the second page.

⁵⁷The author would especially like to acknowledge the worthwhile comments on the questionnaire format offered by Dr. F. E. Brown of the Wharton School of Finance and Commerce.

Pretesting the
Questionnaire

The initial questionnaire was then administered to 22 subjects. They included six housewives and sixteen marketing research students. The responses of the subjects were then hand-tabulated to determine what changes should be made in the phrasing of the questions, in procedures for the administration of the study, and in the structure of the questionnaire. On the basis of their comments and an analysis of responses, minor changes were made in both the instructions to the participants and in the format of the questionnaire. The most significant change required altering the question concerning buying propensities. An analysis of replies revealed little dispersion from the original statements. As a result, the number of possible responses was expanded from five to seven, ranked in decreasing order. A consensus with regard to the ordinal ranking of the statements was confirmed by first having a group of forty-two junior and senior retailing students individually sort a randomly ordered list of revised statements into expressions of decreasing preference. There were thirty-nine consistent rankings, and the three which were not consistent did not substantially deviate from the dominant order.

The Administration of the Study

The initial intent was to gain the voluntary cooperation of various civic, fraternal, social, and religious groups in the south Florida area. But early attempts to solicit subjects at times other than regular meetings of organizations produced disappointing turnouts. As a result, it was necessary to accommodate the needs of the various groups by administering the study before, after, or in conjunction with regular meetings. Additional attempts to solicit the cooperation of activity groups participating in programs sponsored by municipal recreational departments were discouraged by the recreational directors of the three municipalities initially contacted. This refusal was based on experiences others have had in similar circumstances. Such participation, it appears, is strongly resented as an intrusion, when the time demands required by the study would displace the scheduled activity which attracts the participants to the recreational center.

Shortly after group solicitation efforts were undertaken (in February, 1968), a family illness forced postponement of progress for several months. When efforts were reinstituted, time constraints (primarily those imposed by group inactivity during the summer months), required that group solicitation be

accelerated. Furthermore, in an attempt to establish some measure of control over the make-up of the sample group, a contribution of \$1.50 per subject was offered to selected groups as an inducement to encourage participation.⁵⁸ To further encourage involvement, the groups were also promised a copy of the results of the study. By and large, the subjects willingly followed instructions and appeared to take the study seriously.

In the solicitation of the groups, an effort was made to gather responses from diverse organizations. Initially, it was proposed that a sample of 300 subjects should be used, but this was reduced because of a lag in solicitation (brought about by the fact that many of the groups met monthly), some late turnouts (which proved to be disappointing), limits on the number of subjects that could be accommodated in a group administered test, two late season cancellations, and reduced levels of group activity during the summer months. Time constraints were also imposed by limited access to the computer for processing the input. A total of 243 subjects was finally gathered. The sample of subjects produced 234 useable, although not always complete, questionnaires.

⁵⁸ Money to cover these costs were made possible through financial support for the study contributed by the Department of Marketing and Transportation Administration, Michigan State University.

Analysis of the Results

The basic statistic used to determine significant differences in the mean response values of groups assigned odd and even retail price endings was the simple test of the standard error of a difference between uncorrelated means.⁵⁹ This statistic was used with large samples (i.e., $N > 30$) and the results were converted to \bar{z} ratios. Following conventional practice, when the samples in either the odd or even price group were small (i.e. $N < 30$) Fisher's t formula for testing the difference between uncorrelated means was used,⁶⁰ and t ratios were then computed. Because the data were derived from what are narrowly defined as ordinal scales,⁶¹ it was recognized that the analysis should be limited to positional measures. On the other hand, the statistics which are used are intended for use on interval scales.⁶² Because such abuses are the rule rather than the exception, the use of such a statistic involves no great departure from what has been established procedure.

⁵⁹For a description refer to Green and Tull, Research for Marketing Decisions, pp. 307-312.

⁶⁰For a discussion of the application of the statistic refer to: J. P. Guilford, Fundamental Statistics in Psychology and Education (4th ed.; New York: McGraw-Hill Book Company, 1965), pp. 183-184.

⁶¹DuBois, An Introduction to Psychological Statistics, pp. 99-100.

⁶²Green and Tull, Research for Marketing Decisions, pp. 187-189.

The Results of the
Aggregate Questionnaire
Responses at Odd and
Even Prices

A comparison of the responses of all subjects to the value estimates, stated purchase propensities, and perceptions of each of the products at the alternative odd and even prices is offered in the Appendix. The columns for each of the tables indicate the number of subjects exposed to the item at the price ending indicated in the caption as well as the mean value and standard deviation of subjects' responses. The last column offers, as a standard measure, the deviation of each sample difference in terms of a \bar{z} value. The sign preceding the \bar{z} ratio is used to indicate the direction of the deviation. Some of the values (for example, the estimates of value and the intentions of buying propensity) appear to be inversely related. This is because responses in the latter case were assigned values in increasing order. In addition, it was thought that the use of a constant measure of direction for each of the scales would be less confusing. As a result, the negative sign arbitrarily indicates that the even price mean value was greater than the mean value of the odd.

The results of the aggregate analysis reveal six deviations in mean scores which are significant beyond the .05 level. The first significant deviation suggests that the subjects were significantly more disposed to

purchase the woman's cotton knit top when it was priced at \$4.00 than at \$3.98. In addition, they considered their own opinion relatively more important than the recommendations of their friends when the item was priced at the even as opposed to the odd price. The same perceptions with regard to their opinions and recommendations of friends were also found in the case of the cleaning fluid priced at \$1.00 versus \$.98. Two significant deviations in the perception of the "No Turn" Broiler were found. When the broiler was priced at \$25.00 it appeared to be more durable and required less frequent replacement than it was when priced at \$24.98. Furthermore, it was presumed to have been seen by more people when priced at the even ending. Lastly, the indication was that the chip and dip set represents a significantly greater value at the odd versus the even ending when priced at the \$7.98/\$8.00 level.

The Results of the Analysis
of Subjects' Perceived
Customer Roles and
Price Illusion

For each item in the questionnaire the subjects were asked if they were to purchase a product such as the one being shown what their most probable reason would be for making such a purchase? They were offered four alternatives from which to select. The alternatives included: (a) for my own use, (b) for the use of my entire

family, (c) for the use of someone else in my immediate family, and (d) as a gift (for either a family member, relative, or friend). The subjects could indicate more than one alternative if they felt that it was appropriate. For each item the value estimates for the alternative odd and even priced groups were then compared for the various assumed customer roles. The purpose of the analysis was to determine whether the perceived purchase role of the subject was associated with differing degrees of illusion susceptibility for any of the items in the study. These data, and the results of all subsequent analyses, are also included in the Appendix.

Three significant deviations were revealed. In the first case ($p < .05$) the laundry cart appeared to represent a better value at the even price to individuals who were purchasing the item for someone else in their immediate family. Conversely, the cotton blend duster appeared to represent a much better value ($p < .02$) at the odd price to subjects who viewed their buying role in the same light. Lastly, when viewing the purchase of the chip and dip set as a possible gift purchase at \$7.98/\$8.00, it appeared to be a much better value ($p < .01$) at the odd price.

An Analysis of the Effects
of Buying Experience and
Purchase Expectations on
Illusion Susceptibility

In the questionnaire the subjects were also asked whether they had purchased a product such as the item illustrated within the past six months. They were next asked if they planned to purchase such a product within the next six months.

The mean value estimates for each item for the odd and evenly priced groups were then analyzed. The purpose of the analysis was to determine if past purchase experience or anticipated future needs are related to illusion susceptibility.

The results of the analysis revealed three significant deviations. In the first instance those who did not plan to purchase a duster within the next six months viewed the item as representing a significantly better value ($p < .05$) at the odd as opposed to the even price. The odd price also represented a much better value in the case of the chip and dip set priced at \$7.98/\$8.00. This included both those who had not purchased the item within the past six months and those who plan to purchase the item within the coming six months.

An Analysis of Education and
Illusion Susceptibility

In the analysis of the classification data, the questionnaires were first broken down by the highest

formal education grade completed by the respondents. These groups were then combined into two general educational levels. The first group consisted of those subjects whose formal education extended through high school. The second included respondents whose formal education included at least one complete year of college.

An analysis was then undertaken for each of the items. The mean scores of the value estimates for odd and evenly priced groups within each of the educational levels were then compared. The purpose of the analysis was to determine whether significant variations in illusion susceptibility exist among educational levels.

The analysis offered three significant deviations beyond the .05 level. In each case the deviations were found at the higher educational levels. In one instance subjects felt that the women's shorts represented a significantly greater value when priced at the even as opposed to the odd price; just the reverse of the perceptions of subjects with less education--which approaches significance at the .10 level.

In another instance the subjects with more education felt that the reversible broiler represented a significantly greater value ($p < .02$) at the odd as opposed to the even price. Again these estimates were the opposite of subjects with less education--which approached significance at the .25 level.

Lastly subjects with more education estimated that the chip and dip set represented a significantly greater value when priced at \$7.98 as opposed to \$8.00. In this case the subject group with less education shared the same perceptions.

An Analysis of Illusion
Susceptibility and
Occupational Level of
Household Head

As indicated before, a modification of the occupational categories developed by Carman was used as a basis for classifying the reported occupation of the head of the household. Retirees and student household heads were eliminated from the analysis. The remaining categories were broken into two general groupings with occupations such as professionals, managers, teachers, salesmen, clerical workers, and other white collar occupations included in the first classification, and occupations such as foreman, protective workers, skilled tradesmen, laborers, and other blue collar occupations included in the second.

Within each of these groupings the mean value estimates of the subjects exposed to the items at even prices were then compared with the estimates of those exposed to the items at odd prices. The purpose of this analysis was to determine whether differences in

illusion susceptibility could be found within the various occupational classifications of household heads.

Again three significant deviations were disclosed in the analysis of the data. Interestingly, all occur within the first occupational category. Two of the deviations were significant at the .05 and one at the .01 level. The white collar occupational category felt that the casual dress represented a significantly greater value at the even as opposed to the odd price. Conversely, the same group felt that the cotton blend duster represented a significantly greater value at the odd as opposed to the even price. Lastly this group indicated a significant difference ($p < .01$) between the value estimates of a chip and dip set priced at \$7.98 and \$8.00. Consistent with prior results, the item seemed to represent a much greater value when priced at the odd as opposed to the even ending.

An Analysis of Illusion
Susceptibility and
Working Female Head
of Household

Each of the subjects was asked to indicate in the questionnaire if the female head of household was employed. If so, these subjects were asked to indicate whether the female head of household was employed on a full or part-time basis.

The questionnaires were sorted by response alternative and the relative value estimates for each item at the odd and even prices were then established. The estimates were analyzed to determine if any of the three categories--the female head of the household is not employed; the female head of the household is employed; and those cases where the female head of the household is employed full time--offered any difference in illusion susceptibility.

While recognizing that a working wife is a function of such factors as family life cycle, education and unique occupational skills, number of children in the family, and husband's earning power, it can be assumed that families having working wives possess different values. This may be, in part, a product of the additional buying power of the family unit, or the underlying reason which prompts the wife to seek employment. Therefore, such an analysis was deemed worthwhile.

Analysis of the various groups' responses reveals five significant deviations. In the first, the subject group in which the wife was not employed, the carryall bag represented a significantly greater value at the odd as opposed to the even price. The subject group with the wife employed full time felt that the blend duster and the men's knit shirt also represented significantly greater values ($p < .02$) at the odd as opposed to the

even prices. But, this same group felt that the cleaning fluid priced at \$.98 and \$1.00 represented a significantly greater value ($p < .02$) at the even as opposed to the odd price. Finally, the working wife group felt that the chip and dip set represented a substantially greater value ($p < .01$) at \$7.98 than at \$8.00.

An Analysis of Illusion
Susceptibility and
Marital Status

The subjects were then divided by marital status. The single and married respondents were sorted out and the responses of these groups to the value estimates for each item at both the odd and even prices were analyzed to determine whether illusion susceptibility is related to marital status.

Three significant deviations were recorded--two at the .01 level and one at .05. Married respondents felt that the carryall bag represented a greater value at the odd as opposed to the even price ending. Single subjects felt that the casual dress represented a much greater value ($p < .01$) at the even versus the odd price. Married respondents felt that the chip and dip set represented a substantially greater value ($p < .01$) at the \$7.98 as opposed to the \$8.00 price.

An Analysis of Illusion
Susceptibility and Age

The respondents were classified by various age groups. These classifications were recombined into three general age groups; 20 to 34, 35 to 49, and over 50. The mean value estimates of each were analyzed to discover if variations in illusion could be found within the age strata for any of the products.

These data reveal six significant deviations. In the first, the 20 to 34 age group felt that the casual dress represented a significantly greater value at the even as opposed to the odd price. The cotton blend duster appeared to represent a significantly greater value at the odd as opposed to the even price for the 35 to 49 age group. This same age group also felt that the cleaning fluid represented a significantly greater value at \$.98 than at the \$1.00 price, while the over 50 age group saw a significantly greater difference in the value at the \$1.00 price. The older group also saw the evenly priced men's knit shirt as representing a significantly greater value. Lastly, the 20 to 34 age group felt that the chip and dip set represented a greater value at \$7.98 as opposed to \$8.00.

An Analysis of Illusion
Susceptibility and
Income

Each of the subjects was asked to indicate his total family income for the previous year. Those who reported incomes were then grouped into three general classifications. These included: (a) families with incomes to \$5,999, (b) families with incomes between \$6,000 and \$9,999, and (c) families with incomes over \$10,000. The mean value estimates at the odd and even prices for each of the products were then analyzed to determine if differences in income susceptibility could be isolated by the income strata.

The results revealed three significant variations, all within the over \$10,000 income group. These subjects indicated that the carryall bag represented a greater value at the odd as opposed to the even price. On the other hand the value estimates of this income group revealed that the women's shorts represented a significantly greater value ($p < .02$) at the even as opposed to the odd price. Lastly this same income group felt the chip and dip set was a significantly greater value at \$7.98 as opposed to \$8.00.

CHAPTER IV

A TEST OF EFFECT

The General Research Design

As previously indicated, most of the earlier attempts to measure the impact of odd or even retail prices employed relatively simple before-after research designs.¹ Because of the relative insensitivity of such an approach and because of the confounding influences of uncontrollable variables,² the results were generally mixed and the conclusions indeterminate.

With these limitations in mind it was decided that a more conclusive inquiry should incorporate some of the direct and statistical controls offered by experimental designs. The problem then became one of selecting or developing an approach which would provide maximum statistical precision and an unambiguous measure of the effects arising from the alternative endings. Several established possibilities suggested themselves for

¹See supra, p. 34.

²More specifically these influences could include: variations attributable to time, store traffic, related promotions, test awareness among salespeople, stock levels, and order effects.

use,³ but each was rejected because it failed to provide either adequate statistical precision (e.g., randomized block designs), or because of the excessive constraints demanded (e.g., Latin square designs). Finally, a design was devised which incorporated the general characteristics offered in Table 6.

One constraint imposed upon the design was that an equal number of weekly exposures at the odd and even prices should occur within both the rows and columns. The purpose, aside from ease of computation, was to insure that sufficient sales were achieved at each ending so that more reliable statistical inferences could be drawn. In addition, this constraint presumably offered a better balance of the cancelling effects provided by controlled rotation. As a result, the initial assignments of the odd or even treatments was made on a random basis, while the final week (or weeks) were predetermined by the constraint conditions.

Some justification should be offered for the use of the design. Certainly one of the basic requirements of a good experiment is the absence of systematic

³As an example refer to: Seymour Banks, Experimentation in Marketing (New York: McGraw-Hill Book Company, 1965), chaps. iii-viii; D. R. Cox, Planning of Experiments (New York: John Wiley & Sons, Inc., 1958), chaps. vi-xiii; Russell L. Ackoff, Scientific Method (New York: John Wiley & Sons, Inc., 1962), chap. x; B. J. Winer, Statistical Principles in Experimental Design (New York: McGraw-Hill Book Company, 1962), chaps. iii-xi.

TABLE 6.--Rotated factor matrix.

Variable		Factor loadings					Communal- ities h ²
No.	Term	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	
1.	Expensive-Inexpensive	.6059	-.1138	-.4011	.3603	.1550	.6949
2.	Recommended by friends-Own opinion most important	-.0033	-.0483	-.6892 ^a	-.0558	.0265	.4812
3.	Widely advertised-Never promoted	.0010	.1317	-.2884	-.1076	.7261	.6393
4.	Specific use-No need in mind	.4027	.6290	.0948	.0455	.1915	.6055
5.	Practical-Stylish	-.0854	.6928 ^a	.3023	-.2318	-.0706	.6373
6.	Reduces worries-No effect	.2979	.5151	-.2363	.1704	-.1424	.4592
7.	Planned purchase-Impulsive purchase	.7637 ^a	.3627	-.0816	-.0259	.0159	.7224
8.	All brands are the same-All brands are different	-.5179	-.0136	.3895	-.2470	-.2923	.5665
9.	Seldom bought-Often bought	.4892	-.5895	-.0769	-.0270	-.0658	.5977
10.	Other's opinion unimportant-Other's opinion important	-.2108	.1680	.6795	-.0014	-.0205	.5348
11.	Calculated purchase-Habitual purchase	.7629 ^a	-.2503	-.2303	-.0646	-.0356	.7032
12.	Price no object-Price buyer	-.0795	-.1875	-.0816	.7611 ^a	.1076	.6390
13.	Sold in few stores-Sold in many stores	.5105	-.3414	-.2940	.4235	-.2792	.7210
14.	Item important-Price important	.0669	.0676	.1917	.6829	-.1209	.5268
15.	Unnecessary purchase-Urgent purchase	-.0873	-.8197 ^a	.0190	.0967	.0004	.6892
16.	Durable purchase-Frequent replacement	.7663 ^a	-.0304	-.1333	.0496	-.0715	.6134
17.	Not influenced by salesman- Influenced by salesman	-.1542	.1300	.6423	.0479	.0335	.4566
18.	Price unimportant - Shop price	-.4943	-.1377	-.1144	.5899	.0313	.6253
19.	Urgent purchase-Postponed purchase	-.4513	.5915	-.0361	.1033	-.0913	.5739
20.	Brand important-Features important	.1904	.1624	-.4831	.2697	.1362	.3872
21.	It doesn't pay to compare- Comparison shop	-.7190 ^a	-.1310	.1571	.1601	-.0130	.5846
22.	Seen by few-Seen by many	.0120	.1613	-.1152	-.0702	-.6526 ^a	.4702
23.	Popular opinion important-Expert's opinion important	-.4052	-.2993	-.1251	.2875	.2668	.4232
24.	Looks just like me-No personality	.3092	-.4699	-.2401	.3508	.0527	.4998
25.	Useful-Pleasurable	.0870	.7388 ^a	.1306	-.1763	-.0499	.6041

^a Selected as final variable.

error.⁴ Although co-variance analysis is relatively robust with respect to the violation of such assumptions as normality, linearity, and residual variance homogeneity, powerful statistics cannot tolerate a significant amount of systematic error.⁵ On the other hand, one would expect that any attempt to measure the treatment effects would be confounded by such factors as: store volume, market composition and store customer mix, store size, size of product displays, size of department, competitive stores within center, variations in sales support activities, center promotions, assortments in displays of substitute and complementary products, as well as related time factors. The fact that, a priori, we expected the treatment effects to be relatively weak, suggests that one or more of these influences could easily distort or swamp any observed effects unless a large number of stores were incorporated into the study, or the external factors were controlled. For this reason the design uses randomization through frequent change-over in an attempt to maximize the number of replicates within each store and weekly period to insure that the

⁴Cox, Planning of Experiments, p. 5.

⁵Green and Tull, Research for Marketing Decisions, pp. 382-383; Winer, Statistical Principles in Experimental Design, p. 386.

extraneous variables favored neither treatment.⁶ In this way greater assurance was provided that maximum direct control over the extraneous variables had been achieved.

The incorporation of these replicates into the design was deemed to be feasible. Any cross-over effect would probably be minor because of the small absolute change in the prices.⁷ On the other hand, while any carry-over effect is controlled by having an equal number of changes from even to odd prices as from odd to even, failure to comply with the demands of the study would tend to dampen any sales differences attributed to the alternative endings. For example, under the assumption that price illusion is strong, if a delay in changing from an even to an odd price were to occur, fewer sales would be recorded at the odd price and presumably any differences between the alternative endings would be narrowed. On the other hand, if a delay were made in changing from an odd to an even price (and illusion was also strong), greater than actual sales would be accorded the even price--again narrowing any recorded differences at the alternative endings. Furthermore, the same dampening effect, although in the reverse, would also

⁶For a discussion of the value of randomization in experimentation refer to: Cox, Planning of Experiments, chap. v.

⁷The cross-over effect in this case is viewed as any tendency to postpone purchases until the lower prices occur.

operate in the case of strong illusion and a direct price-quality relationship. Recognizing that this dampening bias did exist, it was accepted as a tolerable cost as long as reasonable efforts were made to insure compliance with the changeover requirements of the study. To achieve a comparable amount of control over the extraneous variables by using a less restrictive design would have required a substantially larger sample of stores which would have created further problems in the solicitation of cooperating retailers and in control over the demands of the study.

Furthermore, an analysis of the results of the design revealed that variance attributable to differences between stores and weeks could be isolated and subtracted by blocking along these dimensions. This capability allows a substantial statistical reduction in the size of the experimental error sum of the squares and in the end provides a greater degree of statistical precision.⁸

Lastly, through the use of co-variance analysis a measure of statistical control could also be achieved.⁹ While merchandise available for sale (which consists of ending stock and net sales for the exposure period), was

⁸Banks, Experimentation in Marketing, pp. 87-88.

⁹Winer, Statistical Principles in Experimental Design, p. 358.

finally used as a concomitant variate, ending stock and some measure of departmental sales by store were also considered as possibilities. The former was subsequently rejected when simple correlation analysis indicated that it often proved to be a result rather than a cause of sales.¹⁰ The latter possibility was rejected because the experimental design provided some control for sales variations over time. In addition, because a single store group was used, any promotions creating variations in store or departmental volume would, in most instances, have a proportionate effect on all stores within the department store group for any given period of time. As a result, merchandise available for sale was selected as the co-variate, while at the same time recognizing that because each merchandise available for sale value contains a segment which is comprised of net sales for the week, it is not independent of the variate,¹¹ but rather is biased in favor of a positive correlation between the two.

Pre-Conditions to the Study

In order to achieve a greater measure of direct control over factors which might confound the treatment

¹⁰Several instances of significant negative correlations were observed, particularly in situations of relatively low stock levels, which suggested that the direction of causation was inverse.

¹¹Banks, Experimentation in Marketing, p. 128.

effects, a list of item conditions necessary for a reliable and accurate study was developed. These included the following:

1. an adequate back-up stock during the period;
2. sufficient rate of sale to offer statistical stability;
3. an item that is carried in all stores (pre-supposed under number 2);
4. an item which is relatively insensitive to seasonal demand;
5. an item having a relatively broad base of demand (e.g., that the item have no special tourist or gift appeal);
6. the item cannot be advertised during the period;
7. the item cannot be marked down during the period for either clearance or promotional purposes (the former is pre-supposed under number 2);
8. the display of the item should be held relatively constant throughout the study period;
9. that the personal selling factor with regard to the item be controlled (e.g., that the item will not be singularly emphasized by the sales force).

The purpose and need for complying with the list of pre-conditions is evident, but the important point is that satisfying these conditions restricts the product

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possibilities which could be included in the study. For example, most products that present attractive volume possibilities would probably be advertised by a retail buyer within a reasonable period of time. Additionally, astute retailers continually attempt to create interest and freshness, and try to capitalize on changing patterns and periodic peaks of demand by altering displays within their departments.

The Items

Because of the pre-conditions imposed, possible items for inclusion in the study were immediately limited. In addition, several factors outside the demands of the study served to reduce still further the candidate items. Some of the more important limitations were: pre-ticketed merchandise, distributor concern and competitive sensitivity over minor departures from established price points, the firm's policy of immediately meeting competitive promotional prices, and the general instability of established retail price points--the last primarily involved drug items and national brand appliances.

One of the basic considerations in the selection of items was that they be as heterogeneous as possible. It was intended that both male and female market items be included as well as hard and soft goods, staples, hedonic

items, fashion goods, merchandise appealing to a range of age groups, highly visible items, new and established products, and merchandise embracing a broad range of price levels. Additionally merchandise which measured the "double nine" effect (preferably at two price levels), and different quality levels of a similar item selling at different prices were other factors brought to the selection of the candidate items.

The constraints imposed by the preconditions and influences outside the demands of the study forced many compromises with an ideal balance of candidate items. After soliciting the help and suggestions offered by the various merchandising executives of the participating retailer, the items included in Table 7 were finally selected for incorporation into the study. Furthermore, after making an assessment of the expected sales levels for the items and considering the organizational demands required of the study, it was agreed that the effort would extend for a four-week period.

The Participating Retailer

Any agreement to participate in a study of these dimensions involves a substantial opportunity cost to the retailer. Without detailing these costs explicitly, one can readily appreciate the burden such cooperation imposes upon the sales people who are directly involved with

TABLE 7.--List and alternative price endings for study items.

Item	Price
Cotton knit basic women's sportswear top	\$ 3.98/ 4.00
Chip and dip set with salad tongs	7.98/ 8.00
Women's man-tailored tweed shorts by Loomtogs	9.98/10.00
Ever Blum cleaning fluid	.98/ 1.00
Cotton blend duster by Loungees	11.98/12.00
Casual dress by Serbin	17.98/18.00
Men's Ban-lon knit mock collar shirt by Trend	7.98/ 8.00
Women's vinyl carry-all bag	2.98/ 3.00
Laundry cart	5.98/ 6.00
Retailer's private brand reversible broiler	19.98/20.00
Retailer's private brand "No Turn" broiler	24.98/25.00

changing tickets, department managers who are required to determine sales and stock levels, department buyers, and divisional and general merchandise executives. Because of seasonal peaks, which typify most retailing demand patterns, such organizations must operate with some degree of organizational slack in the off seasons. In spite of this, and because many tasks are postponed until these periods, the opportunity cost of participation remains real.

The participating retailer was a leading south Florida department store group. During the study the firm realized annual sales of approximately \$80 million at a main store and five branches extending approximately sixty miles along the south Florida eastern coast. The firm has an excellent reputation in the area and appeals to a broad spectrum of the market--ranging, it is estimated, from the lower-middle to the lower-upper classes.

Although differences in volume levels of stores within the firm do exist, significantly, no single store dominates the group. There is, in fact, an amazingly narrow range of volume generated by the top four stores, which should minimize internal variance, and in this way achieve a more sensitive measure of the treatment effects.

The firm is generally committed to an even price policy. The general exceptions are children's apparel, major and traffic appliances, and those departments (such as drugs) in which presumed customer price sensitivity, and subsequently company competitive policy, requires that all price concessions by competitors be met. It is, of course, difficult to assess, a priori, the strength and direction of any net effect arising from the company's price ending policy. Because of the contrast effect we might expect that there would be a heightened awareness of the odd price. Given that there is no effect beyond

this, and that illusion is strong, we would expect a more significant difference in treatments to result. On the other hand, assuming that this heightened awareness increases consideration of the price variable (as it would probably be given some interpretation by the customer), and given that cognition and illusion are inversely related, we might also assume a less significant difference in treatment effects would occur. But on the whole the assumption of any substantial increase in awareness is probably heroic, so the presumption is that the net effect is minor.

The Time of the Study

In the south Florida area, typical retail demand fluctuations are further compounded by a tourist season factor. Because of the additional stress this season imposes on the existing retail facilities and organization, the demands of the study required that the effort be undertaken at a time other than at this seasonal peak. It is reasonable to assume that the demand patterns of tourists are atypical (the usual assumption being that such demand is more inelastic), and this would presumably dampen any measured illusion. Additionally, one cannot expect that the same level of compliance to the demands of the study would occur during the time

that such acute demand pressures (which must take first priority) are imposed upon the organization.

During much of the "off season" most south Florida retail firms experience a substantial decrease in retail activity. This severely limited the candidate item possibilities and the amount of sales activity each item could generate so as to provide a reliable measure of price effect. Furthermore, retail activity during much of the "off season" is characterized by sales and price promotions which, it is presumed, would also make demand for regularly priced items less sensitive to any price illusion. As a compromise the period between May 1 and May 27, 1967 (although it included a Mother's Day weekend), was finally selected as a feasible alternative.

The Administration of the Study

Because the items in the study were controlled by several merchandise departments in several merchandise divisions of the organization, and these items were to be made available to customers through a group of stores which spanned an extensive geographic area, a problem of control and coordination was presented. It was determined that the basic unit of coordination should be established at the main store department buyer level. At this point the buyers and their assistants were

instructed in the purpose and procedures of the study. Detailed written instructions and summary forms were made available to them and assignments and schedules for compiling the data were established.¹² Prior to the start of the study each of the affected department managers at each of the stores was called and informed about the study by the respective department buyers or their assistants. They were then sent a packet containing instructions detailing their responsibilities, a schedule of price changes as it affected them, and a form for the derivation of net sales and ending stock for items within their realm of responsibility. The sales and stock levels were to be reported to the main store each Monday in order to assure compliance with the demands of the study and to serve as a reminder when changes in price were to be made. Actual checks for compliance with the schedule of price exposures was incorporated into the branch store visits of main store personnel and visits expressly undertaken for this purpose by the author. In addition, weekly visits were made each Monday evening to each of the main department store buyers to insure that the results were being reported, and to answer any questions that may have arisen.

¹²Examples of the forms and instructions used in the study are included in the Appendix.

During the actual time of the study, the cooperation of all participants was very good. For this period only three violations within any department for any item ever came to the attention of the author. It might be noted that any violations would have a leveling effect, although the structure of the design would help to insure that neither treatment would be favored.

During the time the study was being conducted two significant complications arose. In the first instance it was proposed that a woman's sportswear top, which was sold in the budget sportswear department at \$3.98/\$4.00, be incorporated into the study as a test of the difference in illusion between the Budget and Junior departments, as each draw heavily from different age segments and use different degrees of price emphasis. But during the time that the test was being undertaken there was a change of buyers in the budget sportswear department and conditions necessary for the control of sales and ending stock for the item were violated. Consequently the women's shorts, which were available in the better sportswear department, were added as a substitute item two weeks after the start of the test. Therefore, the study period for this item extended two weeks beyond the normal expiration date in order to achieve the necessary twenty-four exposure periods.

Secondly, at the time of selection of the items, the housewares buyer suggested incorporating the chip and dip set into the study. The style of the item was new and the buyer was quite enthusiastic about the prospective sales it would generate. But when the item was introduced, the old style (which was essentially the same item with a different design) was marked down substantially in order to clear it from stock--a violation of one of the pre-conditions. Because of the markdown of the substitute item, and the acceptance of the new style was disappointing, insufficient sales were generated during this period to justify any analysis.

The Analysis

Table 8 summarizes total sales and merchandise item exposures¹³ totally at the odd and even prices for the study period. After compiling the data the next step was to determine if co-variance analysis could be used for each of the items. But co-variance analysis is justified only if one can establish that sales were a function of merchandise available for sale.

Although, at first blush, one might assume that the relationship is strong and self-evident, further consideration leads one to qualify this assumption. In the

¹³A merchandise item exposure is defined as the exposure and availability of an item, within a store, during a week, within the test period.

TABLE 8.--Net sales and merchandise item exposures (MIE)
during the study period.

Item	Odd	Even	Total
	Sales/MIE	Sales/MIE	Sales/MIE
Women's cotton knit top	60/514	57/538	117/1052
Chip and dip set ^a	3/62	1/61	4/123
Women's shorts	51/693	60/690	114/1383
Cleaning fluid	106/881	138/832	244/1713
Cotton blend duster	57/167	83/207	140/374
Casual dress	18/44	19/59	37/103
Men's knit shirt	337/1736	198/1605	435/3341
Carryall bag	180/730	110/623	290/1353
Laundry cart	5/90	7/93	12/183
Reversible broiler	25/124	22/101	47/225
"No Turn" broiler	27/122	23/114	50/236

^aItem not included in study.

situation where all merchandise is displayed on the selling floor, we could expect that with a given flow of traffic through the department, the greater would be the chance of the merchandise display being noticed and, assuming the item has some appeal, an increase in sales would result. One might also expect that where lost sales were an important factor, a positive sales-stock relationship might also exist. Such a situation would be

particularly true in the case of fashion items where customers may have strong color preferences and/or size needs. But it is apparent that this relationship is not linear. We would expect (making some assumptions about stock balance) that sales would be more sensitive to assortments at lower stock levels, whereas, after a point, further increases in stock would have little effect. In fact, with some fashion items, additional increases in stock levels may act as a deterrent to sales because some women value unique style offerings. Although the curvilinear relationship discussed was cited with reference to fashion items, we would expect, although to a lesser extent, the same general relationship would be true of most products.

While the effects described may be consistent with the assumptions held by most individuals, in the case of items such as traffic appliances, which are sold from floor samples, any such relationship would be difficult to support as long as the merchandise was never out of stock. In such cases if a significant sales-stock relationship were evident, we would assume that the measured association was spurious and probably should be attributed to expected sales which were subsequently realized. In the case of one of the two broilers such a relationship did in fact occur. Although in one case the association between the net sales and the merchandise available for

sale was insignificant, the other broiler revealed a relatively high degree of association. Although the assumptions about the relationship were not logically justified, co-variance analysis was used simply to conform to the prior decision rule, and because it had no significant effect on the outcome of the study.

Correlation analysis was used as a measure of the association between net sales and merchandise available for sale for the item during each of the twenty-four periods.¹⁴ If it was found that the measured degree of association was significant at the .05 level, the analysis of co-variance was deemed to be justified. The product moment correlation coefficients for each of the items in the study are offered in Table 9.

Correlation analysis is generally intended to be used as a large group statistic, while our sample was limited to twenty-four exposure periods for each item. As a result, we find that the significance levels are

¹⁴ An exception to the twenty-four exposure periods was made in the case of the casual dress. Because some of the areas in which the participating retailer has located stores draw heavily from tourists vacationing in the south Florida area, and because it has been found that their clothes tastes and needs differ significantly from those of regular south Florida residents, a separate buying staff was used in selected departments to control the offerings in two of the outlets. The casual dress was made available in four of these stores, but was not purchased by the buyer of the so-called "northern concept" stores. As a result, sales of the casual dress were studied for the four-week period within four stores--resulting in only sixteen exposure periods.

TABLE 9.--Item product-moment correlation coefficients.

Item	Coefficient of Correlation
Women's cotton knit top	.495 ^a
Chip and dip set ^c	
Women's shorts	.266
Cleaning fluid	.173
Cotton blend duster	.475 ^b
Casual dress	-.189
Men's knit shirt	.576 ^a
Carryall bag	.616 ^a
Laundry cart	.101
Reversible broiler	.211
"No Turn" broiler	.639 ^a

^aSignificant at the .01 level.

^bSignificant at the .05 level.

^cInsufficient sales.

relatively high (i.e., $r_{.05}(2,24) = .388$ and $r_{.01}(2,24) = .496$). On the other hand, because we are using the concept merchandise available for sale which has a substantial positive bias (it might also be observed that this bias is particularly significant when sales-stock ratios are relatively low), it has been felt that the use of the .05 level of significance was not overly conservative. Additionally, when one considers that the traditional minimum

validity coefficient for a test of practical usefulness, as suggested by C. L. Hull, was felt to be about .450,¹⁵ it would appear that the standard established in this case was not particularly out of line.

Using variance or co-variance analysis, as established by prior decision rules, the F-ratios indicated in Table 10 were obtained.

¹⁵Guilford, Fundamental Statistics in Psychology and Education, p. 104.

TABLE 10.--Item F ratios.

Item	Type of Analysis	<u>F</u> ratios ^c
Women's cotton knit top	covariance	.59
Women's shorts	variance	-1.20 ^{a,d}
Cleaning fluid	variance	-1.36 ^a
Cotton blend duster	covariance	-4.14 ^b
Casual dress	variance	- .01
Men's knit shirt	covariance	.52
Carryall bag	covariance	.74
Laundry cart	variance	- .19
Reversible broiler	variance	.67
"No Turn" broiler	covariance	.17

^aThis approaches the .25 level of significance where $F_{.25}(1,14) = 1.44$.

^bThis approaches the .05 level of significance where $F_{.05}(1,13) = 4.67$ and $F_{.10}(1,13) = 3.14$.

^cAnalysis of variance or covariance tables detailing the derivation of the F ratios above are included in the Appendix.

^dMinus signs preceding the F ratios indicates that greater sales were realized at even versus odd prices.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE STUDY

Introduction

In the analysis of any study, rarely will the results provide clear-cut answers to the questions under investigation. At the expense of pursuing a discussion of alpha and beta errors, we also recognize that the occurrence of any significant deviation, particularly at the .05 level, does not per se suggest the existence of any effect. As a result, in developing our conclusions we first note the incidence of significant deviations, explain their meaning on the basis of the information at hand, attain some perspective by looking across these significant deviations, and then draw inferences about the issues we are pursuing.

The Aggregate Test of Illusion

In testing the first hypothesis we note from the aggregate analysis in Appendix C that fourteen separate measures of illusion were undertaken. Of these fourteen measures one significant deviation in illusion did emerge, and that occurred at the .02 level. On the other

hand the probability is about .3 that a significant deviation beyond the .02 level would have occurred on the basis of chance within one of the fourteen tests. Furthermore, we find no other illusion deviations beyond the .2 level, and eight of the fourteen do not extend beyond the .5 level. Moreover, six of the fourteen deviations are negative (while the remaining eight are positive); suggesting further that the only significant variation may have occurred by chance rather than having been caused by any impact arising from the price endings. Nevertheless we will defer a decision on primary Hypothesis 1a until the subsequent demographic evaluation has been completed.

The Test of Effect

The most immediate conclusion from the analysis of sales in the second phase of the study is that any measured effect is relatively weak. The results indicate that in only one case did differences in sales approach the .07 level. On the other hand, with ten items in the study the probability of a difference this large occurring by chance is .7; so a deviation of this magnitude becomes highly probable. This conclusion seems even more justified because the variation was again found to occur equally in the direction of odd as well as even prices.

As a result it would seem that Hypothesis 1b should be accepted. But one should also consider the possibility

that an effect does exist, but insufficient sales activity was generated for the effect to be established at the conventional levels of significance. Along this line, one might point out that the casual dress and the laundry cart failed to stimulate sufficient sales activity to provide meaningful results (refer to Table 8). On the other hand, their justification for inclusion in the final results lies not so much in the significance that might be attached to them individually, but in what they contribute in terms of a total pattern. It would seem that several of the items together should furnish sufficient sales so that if any reasonable effect did exist a pattern across the ten items would have been evident. But because of the ancipital results (with five items producing sales in the direction of odd prices and five in favor of even), the assumption of a weak or nonexistent effect appears to be tenable. Additionally no apparent consistent direction with regard to either product types, price levels, or price breaks is indicated by the results; further suggesting that the variations are random and no substantial price illusion is apparent.

Purchase Propensities

Of the fourteen measures of purchase propensity we again find one significant deviation, and that occurs at the .05 level. We also note that eleven of the remaining thirteen tests of purchase propensity lie below the .4

level. Furthermore, we again find ancipital variance. While eleven of the fourteen measures are negative, five of those negative deviations lie below the .8 level of significance. These factors suggest that we should accept Hypothesis 2 and conclude at this time that odd and even retail endings appear to have no effect on the subject's indicated buying intentions.

Product Perceptions

Of the 140 tests of product perception we would have expected seven to occur beyond the .05 level on the basis of chance alone. But in looking across the scales for each of the products, we find four significant deviations, three of which are at the .05 level. We must, as a result, accept Hypothesis 4 and assume that in the aggregate odd-even price endings have had no apparent impact on the perception of the items as measured by the semantic differential scales.

Analysis of Demographic Illusion

Although our aggregate analysis indicates that price illusion, as we have attempted to measure it, does not exist for any of the products in the study, the possibility still exists that selected subsets within the subject group may still be susceptible to illusion for some of the products. This illusion may not have been revealed in the aggregate analysis either because the

illusion susceptibility of the subgroup is relatively weak or the illusion susceptibility of the subgroup may be offset or swamped by the responses of subjects in the other cells.

In attempting to assess whether any illusion was revealed through the demographic analysis of the comparative value estimates of the subjects, we note that of the 272 individual evaluations we would have expected that approximately 14 significant deviations would occur on the basis of chance beyond the .05 level; about 5 beyond the .02 level; and 3 beyond the .01 level. But analysis of the data reveals 29 significant deviations, with 5 beyond the .01, and 12 beyond the .02 level. The initial conclusion appears to be that illusion, as measured by the study, does in fact exist for certain products within selected subgroups.

Of the 29 significant deviations, we note that nine of these can be attributed to the comparative evaluation of the chip and dip set at \$7.98/\$8.00. Furthermore, we note that the item at this price line produced the only significant deviation ($p < .02$) in the aggregate test of comparative value estimates. In addition, relatively few subjects were exposed to the item at either the odd or even price (i.e., 35 at \$7.98 and 39 at \$8.00), which would tend to increase the effect of any extreme deviations. We also find that, while

the direction is consistent, the most extreme deviation at either the \$6.98/\$7.00 or the \$8.98/\$9.00 price line just exceeds the .5 level of significance--further suggesting that the \$7.98/\$8.00 deviation may be random. Lastly, although we indicated that the relationship is not direct,¹ we find no indication that the mean values of the purchase propensities between two price endings have been affected (i.e., $\bar{z} = -.116$)--further indicating that the deviation is random. The point at issue is that this possible random variation between the mean values of these subsets compounded the incidence of significant deviations in the demographic analysis by measuring the extreme value perceptions of relatively few subjects several times--particularly so in that a significant deviation for this item at the \$7.98/\$8.00 price level was found in each demographic classification.

Assuming this is the case, and subtracting out all instances of the illusion measures of the chip and dip set at \$7.98/\$8.00, we find that the number of illusion measures becomes 253, which should, on the basis of chance, produce about 13 deviations beyond the .05 level. But we still find 20 significant deviations where $p < .05$. Furthermore, to avoid being ultraconservative, if

¹For the chip and dip set, at all price levels, a subsequent measure of the relationship between value estimates and purchase propensities found $r = -.471$.

we subtract out all chip and dip set measures (for the same reason we used to justify their elimination at the \$7.98/\$8.00 price level), we are left with a total of 215 measures which should produce about 11 significant deviations at the .05 level, while the number of actual deviations remains at 20. Therefore, we conclude that for certain customer segments price illusion is a factor in the evaluation of certain products. But while the demographic analysis indicates that illusion appears to be a factor, the results also suggest that the direction, intensity, and extent of its impact is complex and subtle.

Illusion by Demographic Groups

For the reasons detailed above, we will recognize the bias produced by the chip and dip set, and will exclude it from our subsequent analysis. Furthermore, although we discussed the significant deviations in Chapter III, it is necessary to consider each again in an attempt to integrate them in a broader frame.

Subject's Perceived Customer Role

Excluding the chip and dip set, the analysis of responses by perceived customer buying role produced 31 measures for the remaining ten items. With this number, random variation alone would have produced one to two deviations beyond the .05 level. Two were in fact

produced, with one beyond the .02 level. While the decision is marginal we will not reject Hypothesis 4 and will tentatively accept the statement that perceived customer role does not appear to be related to price illusion.

Past Buying Experience and Future Purchase Expectations

The analysis of past buying experience and future purchase expectations produced 34 illusion test possibilities. While this number should have produced about two deviations which are significant beyond the .05 level, only one at the .05 level was revealed. In this instance we again will not reject Hypotheses 5 and 6, and will tentatively accept the position that past buying experience and future purchase expectations are not related to illusion susceptibility.

Education Levels

In the case of educational levels we found that of the 20 possibilities, one chance variation would have been expected. In this instance two significant deviations (one beyond the .02 level) were actually recorded. We will, as a result, reject Hypothesis 7. In attempting to assess the nature of this illusion we find that the effect is mixed, although both occurred within the higher educational strata. In the case of the women's shorts we find that the illusion is a combined result of lower

value at the odd price and higher value at the even. To a lesser extent, this also appears to be the pattern within this stratum in the case of the other fashion item--the casual dress. Moreover, with this item we note that the value impressions of the other educational stratum are reversed, causing extreme and significant value estimates within the price endings between strata.² On the other hand, these between strata differences are not found in the case of the casual dress.

With one exception, a reasonable measure of between strata agreement exists for all other items. The exception involves the other significant deviation--the reversible broiler. In this case the odd price impact on the two strata are reversed. The odd price ending resulted in a much higher value estimate in the case of the upper educational stratum, while it resulted in a lower mean estimate with subjects who did not attend college.³ No substantial difference between the strata arises from the use of even endings.

One last point should be noted; in both instances the items involved tests of the "double nine" effect.

²The differences in the value estimates approach the .02 level in the case of the odd prices although the even is at the .16 level.

³The difference between the strata is significant at $p < .001$.

In general we conclude that subjects with more education appear to be more susceptible to price illusion--but the nature of this illusion is mixed. In the case of fashion goods a strong price-quality relationship appears to exist. It would seem that the use of even prices acts as a slight (although not significant) inducement to sales, while the use of odd prices acts as a significant deterrent. The reverse appears to exist in the case of subjects with less education. Conversely, with appliances significant evidence of illusion is also found, although in this case the use of odd prices substantially enhances the appeal of the item among those with more education. In sum it appears that the "double nine" endings have a strong and mixed impact on various educational strata, which differs among product types.

Occupational Classifi-
cation of Household
Head

In this case we have 20 tests of illusion which should produce one significant deviation on the basis of chance. But we again find two significant deviations which suggests that we should reject Hypothesis 8.

As with educational levels, the two significant deviations are also mixed, although in this case, they both involve ready-to-wear items. Both deviations

occur within the white collar stratum, which suggests that this group seems to be more susceptible to illusion than subjects from blue collar homes. In exploring the nature of the illusion we find, in the case of the casual dress, the illusion also results from higher values being assigned to the item at the even price. Thus it appears that with fashion items the positive price-value relationship is an effective influence and suggests that even price endings may, in some situations, function as a purchase inducement.

Conversely we find that with the duster this same group significantly undervalues the item at the even price--suggesting that in this case even prices would serve as a purchase deterrent. This is the opposite of the illusion direction of blue collar subjects, which suggests that while even prices may act as a strong deterrent in the former situation, the price endings are interpreted differently between occupational strata in the case of this item.

Working Female Head
of Household

In this case the analysis has produced thirty tests of illusion. But we also recognize that the three classifications are not discrete. More specifically, the "wife does work" category is composed of wives who

work both part and full time. Therefore, the "wife works full time" classification is really a redefinition of the former. Given that the "wife works full time" group is especially susceptible to illusion and represents a substantial portion of the "wife does work" classification, it would tend to bias the results. But because the former classification produced no significant deviations and the final conclusions were not affected, the issue becomes moot. To begin with, and under the conservative assumption that the categories are discrete, we would have expected one to two random deviations at the .05 level. But we find four, all of which are significant beyond the .02 level.⁴ As a result Hypothesis 9 must be rejected.

In looking at the significant deviations more closely we find that the group with wives employed full time accounted for three of the deviations and the wives not working group accounted for the one which remained. This would lead us to conclude that illusion susceptibility does differ between the classifications, and that families in which the female head of the household is employed full time are more susceptible to illusion.

⁴If we were to compare the first and third categories, we would have had twenty tests, which on the average, would have produced one significant deviation by change beyond the .05 level while the number of significant deviations would have remained at four.

In cases where the wives are employed full time we find that the effects are mixed. The illusion in the case of the duster and the knit shirt was a combined product of higher valuations at the odd price, and lower valuations at the even, with the reverse occurring in the case of the cleaning fluid. We might conclude that for this group (i.e., in the case of the ready-to-wear items) odd prices appear to encourage sales of items and even prices to discourage them, while the opposite would hold true in the case of low priced instrumental items.

In the "wife does not work" group, the illusion found in the case of the carryall bag is a product of substantially lower valuations at the even prices. Lastly, we note a general consistency in the direction of the deviations between these strata for all items.

Marital Status

In this case we again have twenty measures of illusion and two significant deviations (one at the .01 level). We would, as a result, also reject Hypothesis 10.

In looking at the deviations we find that both married and single subjects appear to be susceptible, although the types of products and the direction of the illusion differed between the strata. The single group valued the dress substantially lower at the odd ending while valuing it significantly higher at the even--

suggesting that, in addition to illusion, a strong positive price-value relationship existed. Interestingly neither the illusion nor evidence of the positive price-value relationship is found in the case of the women's shorts. In the case of the dress the even price apparently served as a positive inducement to purchase.

Married subjects assigned a higher overall value to the carryall bag at both price endings, and at the same time valued the item at the odd price more highly still. As a result we find the item highly regarded by the group, with the odd price serving as an even greater inducement to purchase.

Age

Again we have thirty illusion possibilities among the various age strata which would have been expected to produce one or two deviations by chance. Because five were actually revealed, we must then reject Hypothesis 11.

In this case we find one deviation at the 20-34 age group, two in the 35-49 group, and two in the group over 50. We also observe that the nature of the deviation appears to be somewhat consistent within the strata.

First of all, the 20-34 age group is the only one revealing significant valuation deviation for the fashion items. Furthermore, the nature of this

deviation was prompted by lower valuations for the item at the odd price. It would, as a result, appear that in this case odd prices operate as a purchase deterrent.

The 35-49 age group, on the other hand, valued the duster substantially higher at the odd price and somewhat lower at the even, which are about the same valuations assigned to the cleaning fluid. But the over 50 age group assigned a substantially lower value to the cleaning fluid at the odd price and essentially the same valuation at the even. Therefore, it appears that while odd prices act as a strong purchase inducement for the 35-49 age group, it acts as a deterrent to the over 50 group. Similarly the over fifty group valued the men's knit shirt much lower at the odd price, but also valued the item much higher at the even. It seems appropriate, as a result, to conclude that the impact of odd and even price endings on selected items are interpreted differently by the various age strata.

Income

With three income strata we are offered thirty tests of illusion. These tests produced two significant deviations; one at the .02 level. Because 1.5 deviations beyond the .05 level would have been expected on the basis of chance, this creates another marginal situation.

As a result of some consistencies which will be discussed later, we will tentatively reject Hypothesis 12.

In this case we find the instances of illusion confined to the over \$10,000 income group, although the nature of the illusion is mixed. The significant deviation in the case of the carryall bag is brought about by substantially higher valuations at the odd price and substantially lower valuations at the even. But we find the situation just reversed in the case of the women's shorts. In this instance the item was assigned a very high valuation at the even ending. As a result we find that with one product the odd price appears to offer a strong inducement to purchase, and in the case of the other it acts as a strong deterrent--and vice versa for the even price. Therefore, it seems that the nature and direction of illusion for this income strata is peculiar to the product or item.

Illusion Between Price Lines

In the case of the chip and dip set we find one instance of illusion beyond the .02 level at the \$7.98/\$8.00 price line. While such evidence would be sufficient for us to reject Hypothesis 13, observations appear to be appropriate in this regard. We might first note the relatively small differences in valuations between the price lines. As a result we might first

question the ability of the study to make discriminations in valuations. But when we consider the broad range of mean values between products (refer to Table 12) and the differences in the value levels between subject groups (refer to Appendix D) the internal question, if not the external issue, appears to be satisfied.

We must, therefore, conclude that a strong positive price-quality relationship has had a substantial influence on the subjects' value estimates. This would indicate, at least in the case of this item, that values are determined in a relative manner and further suggests that perceived quality is in large part a function of price. This makes the number of significant deviations revealed by the analysis even more meaningful. If, as suggested, the perceived quality level of an item were to covary positively with the perceived price, it would dampen changes in value estimates between endings even when illusion is strong.

Moreover, the illusion measures suggests that illusion susceptibility is curvilinear; with susceptibility being a partial function of what the customer may consider to be the appropriate price range for the item. Lastly, in looking across the mean values at the alternative prices we see that the illusion occurs as the combined result of a higher value at the odd price plus a lower value at the even.

While the statements offered above are admittedly precarious, the results support little in the way of alternative conclusions, unless one is to discount the deviation as random--which would be even more difficult to justify in view of its .02 significance level.

The Relative Impact of
\$.98 and 98¢ Prices

In an analysis of mean value levels between the \$.98 and 98¢ prices, we find an infinitesimal difference between them. Therefore we have no reason to reject Hypothesis 14.

An Assessment of Illusion by Product

The number of significant deviations by product, as well as their intensity, direction, and the demographic breaks with which each is associated, are listed in Table 11.

We note that no significant deviations were found in the case of two of the items--the cotton knit top and the "No Turn" broiler. Furthermore, we note that two additional items, the reversible broiler and the laundry cart, produced just one significant deviation each, although in the former case the deviation exceeded the .02 level. In the former case the subjects felt that the item represented a much greater value at the odd price, while in the latter the item was viewed

TABLE 11.--Number, intensity, and direction of significant deviations by product.

Demographic Break	Direction and Significance Level
<u>Carryall Bag</u>	
Wife does not work	.05
Married	.05
Family income \$10,000 +	.05
<u>Women's Dress</u>	
White collar occupation	-.05
Single	-.01
Age 20-34	-.05
<u>Women's Shorts</u>	
Education includes some college	-.05
Family income \$10,000 +	-.02
<u>Laundry Cart</u>	
Purchased for someone else in immediate family	-.05
<u>Reversible Broiler</u>	
Education includes some college	.02
<u>Cotton Blend Duster</u>	
Purchased for someone else in immediate family	.02
Do not plan to purchase the item within next six months	.05
White collar occupation	.05
Wife employed full time	.02
Age 35-49	.05
<u>Cleaning Fluid</u>	
Wife employed full time	-.02
Age 35-49	.05
Age 50 +	-.05
<u>Men's Knit Shirt</u>	
Wife employed full time	.02
Age 50 +	-.05

at a lesser value at the odd price. In the first case the odd price functioned as a sales stimulus and in the latter as a deterrent. On the other hand we find that the blend duster accounted for five of the significant deviations--all in favor of the odd price. We might also note that the groups revealing significant illusion susceptibility in the case of this item appear to be heterogeneous, having few common characteristics among them. If anything, they seem to be groups not strongly involved with the product--but, we also found that few subjects were closely involved with the laundry cart, yet it reveals but one significant deviation in the opposite direction. Nevertheless, the duster has produced five instances of significant deviation, and in each case the item appears to represent a significantly greater value at the odd price.

As we assess the nature of the illusion with regard to the blend duster more specifically we find that in the first four cases the significant deviation is more the result of substantially less value being attributed to the item at the even price rather than a greater value being attributed to it at the odd. In the last case the deviation is a combined product of greater value being attributed to the item at the odd price and lesser value at the even. As a result, we might conclude that in this

case, rather than odd prices functioning as a sales stimulus, even prices operated as a deterrent.

In passing we might also note that the subjects felt that the duster was by far the worst value of the eleven items in the study. The mean value estimate for the duster was 4.16 as compared with 4.60 for the casual dress, which was the next lowest item, and 5.74 for the reversible broiler which was the highest rated item in the group (refer to Table 12). Furthermore, we find that the difference between the mean quality estimate (which was made before exposure to the price variable) and the mean value estimate was greater for the duster than for any other item in the study. The implication is that the duster was also perceived as being the study's most overpriced item.

We might also note that the two fashion items in the study, the women's shorts and casual dress, produced five groups who appeared to be susceptible to price illusion. Interestingly, the direction of the illusion was inverse (i.e., the items were seen as representing significantly greater values at the even prices) in each case. Furthermore, it seems that the subjects comprising each of the five demographic cells which accounted for the significant illusions would be considered prime prospects for the items at the price.

TABLE 12.--Item mean quality and value estimates.

No.	Item	Mean Value Estimate	Standard Deviation	Mean Quality Estimate	Difference
1.	Carryall Bag	5.555	2.734	5.254	- .301
2.	Casual Dress	4.607	2.293	5.742	1.135
3.	Women's Shorts	4.668	2.256	5.690	1.022
4.	Laundry Cart	4.953	2.159	5.409	.456
5.	Reversible Broiler	5.745	2.428	6.208	.463
6.	Cotton Blend Duster	4.161	2.042	5.591	1.430
7.	Cotton Knit Top	4.897	2.017	4.936	.039
8.	Cleaning Fluid	5.274	2.673	5.561	.287
9.	Men's Knit Shirt	5.230	2.194	5.926	.696
10.	"No Turn" Broiler	5.494	2.064	5.944	.450
11.	Chip and Dip Set	4.850	2.056	5.876	1.026

While the specific nature of the illusion for the fashion items is somewhat mixed, it appears to be pronounced. In the case of the woman's dress, the first two groups attributed greater value to the item at the even price, while in the last group the illusion was more a result of lesser values being assigned the item as the odd price.

The same essential results produced the illusion found in the case of the shorts. While the subjects who were more highly educated attributed lesser value to the item at the odd price, the illusion is more a result of greater value assigned the even price. This was also true of the upper income subjects.

It appears that with such groups even prices act as an inducement to sales for fashion items. Because these groups appear to be prime prospects for the items, and the extent of their involvement is greater, it seems that illusion is more inclined to occur and function inversely in such cases.

Two additional items revealed three groups of subjects who appear to be susceptible to illusion. With the carryall bag each of the groups saw the item as a significantly greater value at the odd price. While the groups seem unrelated, the product has a relatively broad base of appeal which would make it attractive to each of the groups.

The cleaning fluid, on the other hand, produced mixed results. As with the carryall bag, the cleaning fluid also has a relatively broad appeal, although the cleaning fluid is somewhat more instrumental and is less visible.

Specifically, significant deviations in the case of the bag arose from greater values being assigned the item at the odd price; although the married group also assigned a greater value item at the even price. This suggests that in addition to the illusion created by the odd price, married subjects generally evaluated the item more positively. Conversely, while the odd price also had a positive effect on the value estimates of the over-\$10,000 income group, much less value was assigned the item at the even ending. Thus, while the odd price served as a purchase inducement, in this instance the even price also operated as a deterrent. In general, we conclude that the use of an odd price served as an inducement to purchase in the case of this product.

With the cleaning fluid we had a mixed situation. While the group with the wife employed full time assigned the item a much lower value at the odd price and a higher value at the even, the 35-49 group reversed their valuations--assigning higher values at the odd and lower values at the even prices. This 35-49 age group contrasts strikingly with the estimates of the subjects

over 50. The evaluations of the older age group were generally lower for this item, but the item at the odd price was evaluated substantially lower yet. It also appears that valuations of the item are volatile, which in part may be attributed to the mixed relationship which appears to exist between item valuation and product involvement as well as the impact of illusion on a relatively low priced item as suggested by the Weber-Fechner law.^{5,6} Using an adaptation of this law to the situation at hand we can assume that the effect of a given amount of illusion would be inversely related to the price of the item.

In the case of the men's knit shirt another mixed effect was revealed. In the first group we find that illusion is primarily a product of higher valuations at the odd price, although the difference is heightened somewhat by lower valuations at the even ending. But the situation is completely reversed in the case of the over 50 age group. In this case the effect arises from lower valuations at the odd price and higher valuations at the even. Interestingly, in seven of the first ten

⁵Richard Lee Miller, "Dr. Weber and the Consumer," Journal of Marketing, XXVI (January, 1962), 57.

⁶For support confirming the existence of this effect refer to: Gabor and Granger, "Price Sensitivity of the Consumer," pp. 40-44; Gabor and Granger, "Price as an Indicator of Quality: Report on an Enquiry," pp. 47-48; Olander, "The Influence of Price on the Consumer's Evaluation of Products and Purchases," p. 49.

products, the valuations of the 35-49 and over 50 age group are strongly reversed. Furthermore, the age and wife employed full time groups have accounted for each of the mixed results by products which have been detected.

In looking across products we generally conclude that ready-to-wear items are somewhat more susceptible to illusion than are hard goods. Interestingly this does not appear to be related to the subjective and ambiguous bases upon which the valuations are based. The standard deviations of the mean quality estimates of the ready-to-wear items are, if anything, somewhat more tightly clustered than are items 1, 4, 5, 8, 10, and 11 (refer to Table 11). While items 4, 5, and 10 should on the average have accounted for six of the twenty significant deviations, and items 2, 3, 6, 7, and 9 should have accounted for ten, the results reveal two in the first group and twelve in the second.

Furthermore, we find that with the ready-to-wear items the nature of the illusion is not consistent. When the item is not highly valued and does not appear to be involving, the use of even price appears to function as a deterrent to sales--presumably in such a situation potential sales would not be realized. But when the ready-to-wear item seems to be involving to prospective customers, the use of even prices appears to enhance the valuation of the item. In this case the nature of the

illusion is inverse and even prices appear to act as a stimulus to sales, creating a strong and positive price-value relationship. The case of the men's knit shirt is mixed in that both odd and even prices may act as a stimulus or as a deterrent to purchase by various customer groups.

In addition to the fact that the incidence of illusion is less frequent, we find the results of the study are also mixed in the case of hard goods. One of the broilers and the laundry cart each produced one instance of illusion--and these produced mixed results which frustrate any attempt at generalization. In the case of the broiler the illusion arises because of a substantially higher value being assigned the item at the odd price by subjects with more education. We indicated that this could be attributed to the "double nine" effect. But we note that the odd price also received a much lower valuation by the stratum with less education--resulting in an extreme difference in odd price valuations between the strata which is significant at the .001 level. On the other hand very little difference is found at the even price. Furthermore, in the case of the "No Turn" broiler the direction of the illusion is in the reverse--although this difference is only significant at the .4 level. This would suggest that the significant difference recorded in the case of the reversible broiler arises from

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the "double nine" effect of the odd price and is less directly related to the item.

In the case of the laundry cart the deviation is attributable to lower valuations at the odd price. Because it appears to defy explanation this instance of illusion might be attributed to random variation.

We have already spoken of the volatility of the cleaning fluid which may have accounted for the mixed results registered. On the other hand the carryall bag suggests that the use of odd prices results in a more positive valuation, and presumably is a stimulus to sales, although the upper income group also saw the even price as a sales deterrent. Again we note that the customer was probably not overly involved with the item in spite of its visibility.

Conclusions

First of all we must recognize that demographic variables are seldom the direct determinants of behavior, but such observed relationships do afford us insights based on the inferences which can be drawn from them. With this in mind as we look across the instances of illusion by demographic breaks, we note that greater illusion susceptibility appears to be associated with subjects who are more highly educated, whose household heads have white collar jobs, who possess higher incomes,

and have female household heads who are employed full time. It would seem that these subjects have many interests and characteristics in common. The most common characteristic of these groups is greater buying power. This being the case, we might further conclude that the price variable is relatively less significant for such subjects, any any purchase deliberation would be more involved with the non-price features of the item. Because an absence of deliberation is a precondition to the existence of illusion, this lesser concern with the price variable has produced the increased incidence of such illusion.

We also note that the direction of this illusion is mixed. In some cases odd prices enhance the value impressions of the item, and in others they depress it--and vice versa. But in general we find that for fashion items, and those items with which the subject is more highly involved, a positive price-value relationship appears to exist. While the cause of this inverse illusion cannot be determined, it may be a product of previous associations in which even prices are more commonly used by "better" or fashion-right stores, while odd prices are generally used by firms that have less fashion authority. Another more remote possibility is that the odd prices evoke a nine-promotion association which

suggests that the fashion item may not be appropriate, enhancing, or timely.

We also find that with items which are seen as representing poor values (e.g., the cotton blend duster), odd prices result in a very positive valuation of the product. In this case it may be that the item represents a cost which they attempt to minimize, and odd prices help accomplish this, with the result that such endings function as positive inducements to purchase.

Alternatively, when an item is non-involving, is instrumental and represents a good value to being with (e.g., the carryall bag) the use of odd prices again facilitates purchase, but it appears to accomplish this by making a "good buy" appear even better. Lastly, we might conclude that the impact of illusion on the lower price levels for non-involving, instrumental products (e.g., cleaning fluid) is relatively strong.. Because subjects react to such illusion in a mixed fashion, the effect is to create a high degree of volatility in the valuation of the item among demographic groups.

With regard to marital status and age groups we find nothing to suggest that any of the classifications is more susceptible to illusion than others, although it appears that the direction and nature of the illusion for product types is mixed and is peculiar to each group.

The mixed and complex nature of illusion which has been revealed may also explain why the aggregate analysis produced fewer significant deviations than we would have expected to occur by chance. It may be that because the direction of the illusion is mixed and is peculiar to products and strata, the net effect is to cancel (or swamp, in instances when the group susceptible to illusion is relatively small) the results of any aggregate measurement.

Lastly, we must consider the relative strength and ultimate effect of this illusion. While the first phase of the study suggests that odd prices in some cases function as a strong purchase inducement, as in the case of the duster, the actual sales in the latter phase revealed a positive price-value relationship which approaches the .07 level of significance. This alone suggests that intervening and situational variables dominate the purchase situation to the extent that any illusion which might be measured is swamped. On the other hand, the results of the first phase also suggest that greater sales should be realized at even prices, in the case of the women's shorts (partially confirmed), and in the case of the women's dress (no effect). But in the case of the latter item, while covariance analysis functions well as a small group statistic, limited sales and exposure of the item was realized during the period of the study, which

allows us to discount somewhat the sales results produced by this item. Furthermore, the first phase results suggest that the carryall bag should realize greater sales at the odd prices (partially confirmed) and weakly suggests that no effect should be realized in the case of the cleaning fluid (partially refuted).

On balance, it seems we must qualify the predictive value of the first phase as it related to any particular retailer or customer mix, and tentatively accept the view that while price illusion apparently does exist, its net effect, as it manifests itself at the point of purchase, is weak. As a result we will finally reject the primary Hypothesis 1a and will continue to accept primary Hypothesis 1b.

Recommendations for Further Research

As is apparent, the larger part of the data generated by the study has yet to be analyzed. Some possibilities for subsequent investigation include:

1. An analysis of variations in quality and value estimates among demographic groups.
2. An analysis of individual item perceptions among demographic groups.
3. An analysis of the relationship among value estimates, quality estimates, and product perceptions.

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4. A study of the relationship between product perceptions and indicated degrees of buying propensity for individual products.
5. An inquiry into the relationship between quality and value estimates and buying propensities.
6. An analysis of the relationship between buyer role and product perception.

The results of the study also suggest that it might prove worthwhile to extend the size of the sample in order to provide a basis for the analysis of responses after cross-classifying the results. For example, one might study the item perceptions and value estimates of male versus female subjects at various income levels who perceive the item as a gift purchase as opposed to those who might be purchasing for their own use.

Furthermore, the study could be extended by incorporating variations into the same general research design and in this way contrasting the perceptions and value estimates of national versus private or non-brand items. One might also vary the conditions of the study by studying responses to varying degrees of exposure to the item, by varying the information furnished about each item, or by specifying and altering the response times of the subjects. In any event the study has prompted many more questions than it has answered, and

the expectation is that subsequent efforts will be directed toward the pursuit of a number of these re-search possibilities.



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APPENDICES

APPENDIX A
INITIAL LIST OF SEMANTIC DIFFERENTIAL SCALES

INITIAL LIST OF SEMANTIC DIFFERENTIAL SCALES

TABLE 13

INITIAL LIST OF 42 SEMANTIC DIFFERENTIAL SCALES

One brand is as good as another	-	The only brand I would ever use
Saw it advertised	-	Unadvertised
Expensive	-	Inexpensive
Recommended by friends	-	Own opinion most important
Widely advertised	-	Never promoted
Specific use	-	No need in mind
Impulsive purchase	-	Cautious purchase
I looked all over before deciding	-	I bought the first place I looked
Practical	-	Stylish
Complete information	-	Impulsive purchase
Reduces worries	-	No effect
Planned purchase	-	Impulsive purchase
All brands are the same	-	All brands are different
Seldom bought	-	Often bought
Brand important	-	Brand unimportant
Other's opinion unimportant	-	Other's opinion important
Calculated purchase	-	Habitual purchase
Brands similar	-	Brands different
Status item	-	Status unimportant
Price no object	-	Price buyer

Sold in few stores	-	Sold in many stores
Sold at Discount Stores	-	Sold at "better" stores
Item important	-	Price important
Unnecessary purchase	-	Urgent purchase
Brand loyal	-	Brand unimportant
Dealer's service important	-	Dealer's service unimportant
Durable item	-	Frequent replacement
Not influenced by salesman	-	Influenced by salesman
Necessary purchase	-	"Fun" purchase
I checked all over before deciding	-	I bought the first place I looked
One brand works as well as another	-	They are all different
Price unimportant	-	Shop price
Urgent purchase	-	Postponed purchase
Maximum quality	-	Adequate quality
Brand important	-	Features important
It doesn't pay to compare	-	Comparison shopping
Spur-of-the- moment purchase	-	Specific item in mind
Seen by few	-	Seen by many
Frivolous	-	Necessary
Popular opinion important	-	Expert's opinion important
Looks just like me	-	No personality
Useful	-	Pleasurable

APPENDIX B
STAGE I STUDY MATERIALS

STAGE I STUDY MATERIALS
INSTRUCTIONS TO PARTICIPANTS

Purpose

The purpose of this study is to gather information about the reactions of customers to several products. In approaching the study, try to imagine a customer much like yourself, and indicate on the questionnaire what you feel his or her response might be to each question. Please do not discuss your answers with others around you during the time the study is being administered, as we are interested in your particular views.

The information you provide will be grouped with the answers of others like yourself. These data will be anonymously analyzed to provide the information desired. All answers will, of course, influence the final results, but because the specific questionnaires can in no way be traced to any person, it is necessary to use care in answering the questions.

General Procedures

During the study a picture or sketch of a product will be projected on the screen. At this time a brief description of some of the item's essential features will be read. You are then asked to answer a series of questions about the assumed reactions of a customer like yourself to the item.

1

In the case of the first item projected, I will work through the first series of questions with you. In the process, I will elaborate on the meanings of some of the terms. This should help clarify the intent of each question as well as detail the general procedures we will be following. The same series of questions will then be asked of every other item in the study.

Disregard the numbered blocks which are found on the pages. They are intended for coding purposes, and have no other significance.

Although an effort has been made to make each question as simple and as straightforward as possible, you will probably find the last question to be rather uncommon. As a result, some elaboration is necessary.

The question asks that you rate each illustrated item on the basis of several characteristics. In responding to this question you are to indicate, in the manner which will be discussed, the extent to which you believe each set of terms describes the buyer's feelings about the projected item or the probable circumstances surrounding its purchase. The purpose of the question is to help you establish some essential points about each item being projected.

Procedures for Question Seven

Here is how the scales are to be used:

If it is felt that the item is very closely related to the term at one end of the scale, place your check-mark

as follows:

Expensive: ✓ : : : : : : :Inexpensive

OR

Expensive: : : : : : : ✓ :Inexpensive

On the other hand, if it is felt that the item is quite closely related to one or the other end of the scale (but not extremely) place your check-mark as follows:

Expensive: : ✓ : : : : : :Inexpensive

OR

Expensive: : : : : : ✓ : :Inexpensive

If the item seems only slightly related to one side as opposed to the other (but it is not really neutral), check as follows:

Expensive: : : ✓ : : : : :Inexpensive

OR

Expensive: : : : : ✓ : : :Inexpensive

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the projected item.

If it is felt that the item is either neutral on the scale (both sides of the scale are equally associated with the item) or if you do not think of the item in these terms, then place your check-mark in the middle of the scale:

Expensive: : : : ✓ : : : :Inexpensive

Important: 1) Place your check-mark in the middle of spaces, not on the boundaries:

this			not	this
: ✓ :		:	✓ :	:

- 2) Be sure to check every scale for every item--do not omit any.
- 3) Never put more than one check-mark on a single scale.

Work thorough this general question at a fairly high rate of speed. Do not worry or puzzle over individual items. It is your first impressions (i.e., the immediate feelings about the terms) that are important.

STAGE I STUDY MATERIALS

STAGE I QUESTIONNAIRE FORM

1	2	3	ITEM	CLOCK RADIO	26	27	29	30	32	33
---	---	---	------	-------------	----	----	----	----	----	----

1. Please circle the number below which best describes your estimate of the quality level of this illustrated item.

35

Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5
6	7	8	9	10

2. Have you purchased a product such as this within the past six months?

Yes

37

No

3. Do you expect to purchase a product such as this within the next six months?

Yes

39

No

4. If you were to purchase a product such as this, what would be your most probable reason for making such a purchase?

(a) For my own use.

(b) For the use of my entire family.

(c) For the use of someone else in my immediate family.

(d) As a gift (for either a family member, relative, or friend).

(e) Some combination of above. (Also check the appropriate combination of a,b,c, or d.)

51 53 55 57 59 61 63 65 67 69 71 73 75

5. Assuming that the price of the illustrated item is \$22.98, circle the number below that reflects your best estimate of the kind of value for the price the illustrated item represents.

Poor		Fair		Good		Very Good		Excellent	
1	2	3	4	5	6	7	8	9	10

.....

6. If you were considering the purchase of a product such as this, which one of the statements offered below best expresses your feelings about the illustrated item?

__ I would want to purchase an item just like this.

 I would definitely be interested in looking at this item.

I would consider this item as a purchase possibility.

— I might be interested in this item as a purchase possibility.

— I doubt that I would consider this item as a purchase possibility.

— I would not consider this item as a purchase possibility.

— I would never consider this item as a purchase possibility.

7. Assuming that a customer was to purchase this illustrated item, indicate with a check what you believe are the most likely circumstances surrounding the item's purchase, or the probable feelings about the item.

Unnecessary purchase: : : : : : : Urgent purchase

Price no object: : : : : : : Price buyer

Useful: : : : : : : :Pleasurable

It doesn't pay							Comparison
to compare:	:	:	:	:	:	:	:shop

Planned purchase: : : : : : : Impulsive purchase

Durable item: : : : : : : :Frequent replacement

Practical: : : : : : :Stylish

Recommended by friends: : : : : : : : Own opinion
: : : : : : : : : most important

Seen by few: : : : : : : Seen by many

Calculated purchase: : : : : : : :Habitual purchase

CLASSIFICATION DATA

1. Are you: 5
 Male 5
 Female
2. Are you: 7
 Single 7
 Married
 Divorced
 Widowed
3. Your age: 9
 Under 20 9
 20-34
 35-49
 50-64
 65-over
4. Please circle the highest grade in school that you have completed.
 11 12
 Grade School 5 6 7 8
 High School 1 2 3 4
 College 1 2 3 4 5 6+
5. Indicate the current number of dependent children in your family.
 14
 None 1 2 3 4 5 6+
6. Indicate below the age of the youngest dependent child.
 No dependent children now living at home.
 Under six. 16
 Six to twelve.
 Thirteen to eighteen.
 Over eighteen.
7. For statistical purposes, please indicate your total family income for the past year.
 Under \$4,000 18
 \$4,000-5,999
 \$6,000-7,999
 \$8,000-9,999
 \$10,000-14,999
 \$15,000-or more
8. The current occupation of the head of the household.
 20
9. Is the female head of the household currently employed?
 Yes 22
 No
10. If yes, does she:
 Work part-time
 Work full-time 24

STAGE I STUDY MATERIALS

FIGURE 4

PICTURES AND SKETCHES USED IN STAGE I STUDY



Women's Cotton Knit Top



Chip and Dip Set



Women's Shorts



Cleaning Fluid

FIGURE 4--CONTINUED



Cotton Blend Duster



Casual Dress



Men's Knit Shirt

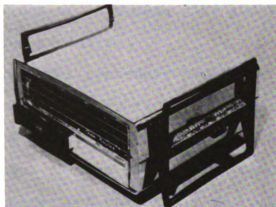


Carryall Bag

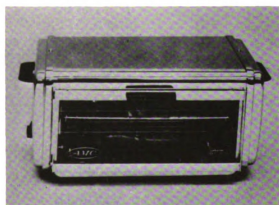
FIGURE 4--CONTINUED



Laundry Cart



Reversible Broiler



"No Turn" Broiler

1

STAGE I STUDY MATERIALS

STAGE I STUDY SCRIPT

Good afternoon (evening) ladies
(gentlemen). First off I would like to
thank you for your participation in this
study. Hopefully the results will be of
some value in providing information about
the reactions of customers like yourselves
to selected products.

The general procedure that we will
follow for this study is that I will first
pass out a pencil and questionnaire to
each of you. Please do not open the
questionnaire, but wait until we read
together the instructions included in the
first three pages. This should help to
answer some of the questions that you may
have.

Pass out
questionnaires

.....

Don't be overwhelmed by the question-
naire's size. In spite of the number of
pages, you will find that completing the
study will only take a little over 30
minutes of your time.

If you will, follow along with me as
I read aloud the instructions included in
these first three pages.

1

Read instructions

.....

Assuming that you would find the final results of the study to be of some interest, within the next few months, after the results have been analyzed, I will be happy to make a copy of the general findings available to you.

Unless there are any problems we will now begin with the first item. As we move into the study do not read ahead, complete each page before moving on to the next, and stay, if you will, within the item section which is currently being presented. As each item is being projected, please be sure that the same item is also typed at the top of the page of each questionnaire item section.

Project AM clock-
radio

.....

As you will notice, this first item is an AM Westinghouse clock-radio. This compact unit incorporates a five tube radio, including a four inch speaker and a built-in antenna, into a sleek upright space-saving plastic cabinet. The item has an easy-to-read contrast clock face, and a single button buzzer alarm adjustment

1

The exterior is available in soft shades of beige, blue or green to blend with any room decor.

Now follow along with me as we complete the first series of questions that relate to this item.

Read aloud
questions 1-7

.....

This concludes the instructions. Unless there are any questions we will now begin the actual study. You will find as you proceed with the study that the questions asked of each of the following items will be the same as those which we have just discussed.

Project items
two, three...etc.

.....

Complete, if you will, the two pages relating to the projected item.

Cotton Knit Top @ \$3.98/4.00

This is a 100% cotton knit sportswear top. It is a basic favorite that can be used to makeup a wide range of casual wardrobe combinations. The top comes in solid colors, is sleeveless, with a popular boat neckline.

1

Chip and Dip Set @ \$9.98, 7.98/8.98,
7.00, 8.00, 9.00

This chip and dip set is hand crafted. Although light in weight, it is unbreakable and can be safely put into a diswasher. The item is stain resistant, and is unaffected by alcohol or citrus jucies. The new, bright daisy pattern is molded into the set to provide long lasting color. As you see, the set also comes with a pair of salad tongs for converting the set to a broad range of additionsl uses.

Women's Shorts @ \$9.98/10.00

These Tara tweed shorts are by Lomtogs. They are man-tailored with side pockets and pleat detail. They are available in a nubby, textured fabric with matching belt. They have been carefully tailored for a smooth and lasting fit.

Ever Blum Cleaning Fluid @ \$.98/1.00

This is an all purpose cleaning fluid that can be used on clothes, furniture, rugs, and drapes as well as other delicate nonwashable fabrics. This broad guage mixture offers effective non-ring

cleaning for most common spots and stains. This item is an established favorite used extensively by professional dry cleaners. It is available in pint sizes.

Cotton Blend Duster @ \$11.98/12.00

This duster comes in a Kodel and cotton, carefree fabric. It launders easily, and requires little or no ironing. It has a snap front closing and sleeves, collar, and front trimmed in matching lace. This robe is by Loungees and is available in a range of soft pastel shades.

Casual Dress @ \$17.98/18.00

This basic white casual cotton, waffle-pique dress is styled and manufactured by Serbin. It is sleeveless, with a popular A-line silhouette. The pockets and neckline are stitch detailed and edged with cording.

Moc-neck Men's Knit Sport Shirt
@ \$7.98/8.00

This is a Ban-lon knit mock turtle collar men's knit pullover manufactured by

by Trend. Made of 100% Antron Nylon, this shirt has fully fashioned ragland sleeves for greater wear, freedom, and comfort. It is available in a range of long-lasting, non-fade, lustrous colors.

Go-Go Bag @ \$2.98/3.00

This item is an all-around carry-all bag in easy-to-clean, long lasting vinyl. The dimensions are: 12x15x3 inches. The bag has a three sided zipper closure for wide opening convenience. The bag is available in many colors and should prove to be ideal for carrying books, papers, or for many other possible uses.

Laundry Cart @ \$5.98/6.00

This laundry cart has four large, clear, lucite casters which allow heavy wet loads to be moved easily. It is built with a strong tubular frame and the hamper is of damproof, heavy vinyl linen. For additional convenience, the unit also has a clothespin pocket. The cart is available in a bright "snowflake" pattern.

APPENDIX C

THE AGGREGATE RESULTS OF SELECTED
STAGE I RESPONSES

TABLE 14.--Value estimates, buying propensity indications, and product perceptions of carryall bag priced at \$2.98 and \$3.00.

Question	Odd			Even			z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
Value Estimate	110	6.945	2.144	124	6.540	2.216	1.414
Buying Propensity	109	3.339	1.528	122	3.320	1.671	.090
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	103	3.680	1.547	119	3.294	1.784	1.719
Price no object-Price buyer Useful-Pleasurable	105	4.895	1.925	120	5.325	1.683	-1.688
It doesn't pay to compare-Comparison shop	109	2.128	1.453	121	2.091	1.361	.198
Planned purchase-Impulsive purchaser	104	5.077	1.774	120	5.492	1.751	-1.749
Durable item-Frequent replacement	103	3.388	1.952	120	3.575	2.205	-.669
Practical-Stylish	104	3.317	1.882	118	3.144	1.993	.662
Recommended by friends-Own opinion most important	109	2.991	1.794	120	3.108	2.024	-.462
Seen by few-Seen by Many	107	5.523	1.631	119	5.286	1.950	.990
Calculated purchase-Habitual purchase	105	5.495	1.562	121	5.612	1.638	-.547
	103	2.709	1.605	116	2.672	1.449	.177

TABLE 15.--Value estimates, buying propensity indications, and product perceptions of casual dress priced at \$17.98/\$18.00.

Question	Odd		Even		z Ratio
	N	Mean	St'd Dev.	Mean	
Value Estimate	122	4.738	2.246	5.120	2.375
Buying Propensity	121	3.785	1.565	3.852	1.632
					-1.243
					- .315
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	114	3.149	1.580	3.194	1.501
Price no object-Price buyer	116	4.569	2.130	4.680	2.128
Useful-Pleasurable	117	3.923	1.975	4.057	2.032
It doesn't pay to compare-Comparison shop	118	5.381	1.873	5.369	1.827
Planned purchase-Impulsive purchaser	116	4.043	2.006	3.971	2.123
Durable item-Frequent replacement	118	3.508	1.894	3.400	1.771
Practical-Stylish	119	4.731	2.069	4.717	1.897
Recommended by friends-Own opinion most important	118	5.881	1.653	5.686	1.714
Seen by few-Seen by many	116	5.638	1.891	5.915	1.666
Calculated purchase-Habitual purchase	113	3.655	1.954	3.356	1.829
					1.159

TABLE 16.--Value estimates, buying propensity indications, and product perceptions
of women's shorts priced at \$9.98 and \$10.00.

Question	Odd		St'd Dev.	Even		St'd Dev.	z Ratio
	N	Mean		N	Mean		
Value Estimate	109	5.000	2.027	123	5.171	2.442	- .580
Buying Propensity	109	3.697	1.443	123	3.724	1.542	- .137
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	103	3.340	1.543	118	3.381	1.636	- .191
Price no object-Price buyer	103	4.718	2.101	118	4.432	2.157	.993
Useful-Pleasurable	106	3.481	2.010	121	3.810	2.005	-1.226
It doesn't pay to compare- Comparison shop	104	5.452	1.829	120	5.317	1.893	.540
Planned purchase-Impulsive purchaser	101	3.505	2.066	121	3.620	2.078	- .410
Durable item-Frequent replacement	104	3.481	1.936	118	3.271	1.858	.818
Practical-Stylish	106	4.509	2.066	119	4.739	2.010	- .841
Recommended by friends-Own opinion most important	105	5.514	1.852	120	5.667	1.734	- .634
Seen by few-Seen by Many	105	5.886	1.623	119	5.765	1.538	.568
Calculated purchase-Habitual purchase	103	3.466	1.827	117	3.333	1.877	.530

TABLE 17.--Value estimates, buying propensity indications, and product perceptions of laundry cart priced at \$5.98 and \$6.00.

Question	Odd		Even		z Ratio		
	N	Mean	St'd Dev.	N		Mean	St'd Dev.
Value Estimate	110	5.255	2.180	123	5.179	2.103	.269
Buying Propensity	107	4.028	1.732	123	3.902	1.645	.561
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	102	3.696	1.776	118	3.576	1.950	.475
Price no object-Price buyer	101	5.297	1.896	118	5.271	1.793	.103
Useful-Pleasurable	105	1.686	1.206	120	1.858	1.331	-1.012
It doesn't pay to compare-Comparison shop	103	5.233	1.972	117	5.419	1.639	- .751
Planned purchase-Impulsive purchaser	102	2.676	1.971	116	2.767	1.980	- .338
Durable item-Frequent replacement	103	2.476	1.728	118	2.483	1.769	- .030
Practical-Stylish	104	1.577	1.026	120	1.750	1.253	- .912
Recommended by friends-Own opinion most important	103	5.311	1.921	117	5.410	1.913	- .380
Seen by few-Seen by Many	103	3.252	2.098	118	2.763	2.007	1.756
Calculated purchase-Habitual purchase	100	2.410	1.569	119	2.454	1.738	- .196

TABLE 18.--Value estimates, buying propensity indications, and product perceptions of reversible broiler priced at \$19.98 and \$20.00.

Question	Odd		Even		z Ratio
	N	Mean	St'd Dev.	Mean	
Value Estimate	106	6.623	1.850	6.280	1.263
Buying Propensity	106	3.132	1.395	3.320	-.978
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	106	3.528	1.683	3.161	1.625
Price no object-Price buyer	105	5.143	1.812	5.453	-1.304
Useful-Pleasurable	105	2.143	1.470	2.033	.599
It doesn't pay to compare-Comparison shop	104	5.548	1.640	5.924	-1.748
Planned purchase-Impulsive purchaser	101	2.248	1.613	2.542	-1.268
Durable item-Frequent replacement	101	1.851	1.189	2.017	-.993
Practical-Stylish	105	2.276	1.618	2.050	1.119
Recommended by friends-Own opinion most important	104	4.567	1.999	4.815	-.891
Seen by few-Seen by Many	104	3.654	1.895	3.667	-.052
Calculated purchase-Habitual purchase	102	2.049	1.410	2.302	-1.338

TABLE 19.--Value estimates, buying propensity indications, and product perceptions of cotton blend duster priced at \$11.98 and \$12.00.

Question	Odd		Even		z Ratio
	N	Mean	N	Mean	
					St'd Dev.
Value Estimate	111	4.514	120	4.200	2.235
Buying Propensity	111	3.910	119	4.286	1.696
					1.134
					-1.790
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	108	3.546	113	3.407	1.712
Price no object-Price buyer	107	5.234	114	4.904	2.060
Useful-Pleasurable	109	2.807	116	2.862	1.717
It doesn't pay to compare-Comparison shop	107	5.477	114	5.430	1.830
Planned purchase-Impulsive purchaser	106	3.538	113	3.425	1.990
Durable item-Frequent replacement	107	3.065	114	3.211	1.861
Practical-Stylish	109	3.514	116	3.302	1.908
Recommended by friends-Own opinion most important	107	5.729	117	5.855	1.532
Seen by few-Seen by Many	110	3.182	116	3.043	1.958
Calculated purchase-Habitual purchase	106	2.925	113	2.938	1.684
					- .059

TABLE 20.--Value estimates, buying propensity indications, and product perceptions of cotton knit top prices at \$3.98 and \$4.00.

Question	Odd		St'd Dev.	Even		z Ratio
	N	Mean		N	Mean		St'd Dev.
Value Estimate	110	5.245	2.046	124	5.226	1.954
Buying Propensity	110	3.900	1.549	124	3.516	1.241
						2.066a
Semantic Differential Scales						
Unnecessary Purchase-Urgent Purchase	104	3.106	1.525	119	3.487	1.483
Price no object-Price buyer	103	4.990	1.898	119	5.109	1.753
Useful-Pleasurable	108	3.417	1.847	121	3.322	1.908
It doesn't pay to compare-Comparison shop	103	5.573	1.623	120	5.442	1.731
Planned purchase-Impulsive purchaser	105	3.848	2.041	118	3.948	2.012
Durable item-Frequent replacement	107	4.393	2.068	118	4.136	1.886
Practical-Stylish	105	4.305	2.038	119	4.151	2.003
Recommended by friends-Own opinion most important	108	5.620	1.609	120	6.067	1.424
Seen by few-Seen by Many	106	5.802	1.569	120	6.133	1.217
Calculated purchase-Habitual purchase	103	3.883	1.922	116	3.595	1.861
						1.118

aSignificant at .05 level.

TABLE 21.--Value estimates, buying propensity indications, and product perceptions of cleaning fluid priced at \$.98 and \$1.00.

Question	Odd		Even		z Ratio
	N	Mean	N	Mean	
				St'd Dev.	
Value Estimate	77	6.312	92	6.609	- .844
Buying Propensity	77	2.779	92	2.957	- .880
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	72	4.986	89	4.809	.602
Price no object-Price buyer	72	4.639	90	4.256	1.106
Useful-Pleasurable	74	1.446	92	1.402	.291
It doesn't pay to compare-Comparison shop	71	4.958	90	4.633	.075
Planned purchase-Impulsive purchaser	71	2.042	90	2.344	-1.141
Durable item-Frequent replacement	73	4.438	90	4.889	-1.168
Practical-Stylish	71	1.366	90	1.411	- .336
Recommended by friends-Own opinion most important	73	3.110	89	3.921	-2.225 ^a
Seen by few-Seen by Many	71	2.352	90	2.533	- .494
Calculated purchase-Habitual purchase	69	3.087	89	3.124	- .112

^aSignificant at .05 level.

TABLE 22.--Value estimates, buying propensity indications, and product perceptions of cleaning fluid priced at \$.98 and \$1.00.

Question	Odd			Even			z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
Value Estimate	62	6.323	2.291	92	6.609	2.152	-.773
Buying Propensity	62	2.903	1.542	92	2.957	1.310	-.225
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	60	4.850	1.759	89	4.809	1.907	.134
Price no object-Price buyer Useful-Pleasurable	60	4.100	2.166	90	4.256	2.209	-.426
It doesn't pay to compare-Comparison shop	61	1.393	1.013	92	1.402	.968	-.054
Planned purchase-Impulsive purchaser	60	4.267	2.294	90	4.633	2.188	-.968
Durable item-Frequent replacement	61	2.656	2.024	90	2.344	1.752	.973
Practical-Stylish	60	4.467	2.194	90	4.889	2.208	-1.143
Recommended by friends-Own opinion most important	61	1.574	1.180	90	1.411	.855	.920
Seen by few-Seen by Many	61	3.508	2.379	89	3.921	2.446	-1.025
Calculated purchase-Habitual purchase	62	2.919	2.089	90	2.533	1.950	1.142
	59	3.237	2.094	89	3.124	2.065	.321

TABLE 23.--Value estimates, buying propensity indications, and product perceptions of men's knit shirt priced at \$7.98 and \$8.00.

Question	Odd		Even		z Ratio		
	N	Mean	St'd Dev.	N		Mean	St'd Dev.
Value Estimate	120	5.475	2.097	111	5.685	2.139	- .749
Buying Propensity	120	3.175	1.406	110	3.145	1.507	.155
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	111	3.811	1.492	107	3.561	1.505	1.226
Price no object-Price buyer	113	4.805	1.964	106	4.670	1.867	.519
Useful-Pleasurable	119	3.630	2.074	108	3.398	2.004	.853
It doesn't pay to compare-Comparison shop	113	5.434	1.687	106	5.604	1.582	- .766
Planned purchase-Impulsive purchaser	112	3.304	2.004	106	3.519	1.909	- .808
Durable item-Frequent replacement	113	3.062	1.816	106	3.198	1.860	- .545
Practical-Stylish	117	4.291	2.129	108	4.037	2.050	.907
Recommended by friends-Own opinion most important	116	5.750	1.607	107	5.692	1.585	.270
Seen by few-Seen by Many	114	5.930	1.593	107	6.140	1.391	-1.041
Calculated purchase-Habitual purchase	110	3.227	1.730	105	3.333	1.865	- .430

TABLE 24.--Value estimates, buying propensity indications, and product perceptions of "No Turn" broiler priced at \$24.98 and \$25.00.

Question	Odd			Even			z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
Value Estimate	127	5.827	1.806	105	5.867	2.093	-.153
Buying Propensity	127	3.724	1.384	105	3.495	1.317	1.283
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	122	3.270	1.694	102	3.108	1.565	.740
Price no object-Price buyer	123	5.211	1.795	98	5.122	1.870	.356
Useful-Pleasurable	126	2.413	1.658	101	2.228	1.534	.867
It doesn't pay to compare-Comparison shop	126	5.762	1.550	98	5.633	1.631	.597
Planned purchase-Impulsive purchaser	122	2.639	1.899	98	2.500	1.780	.556
Durable item-Frequent replacement	124	2.161	1.638	97	1.794	1.112	1.970 ^a
Practical-Stylish	126	2.444	1.674	100	2.050	1.410	1.911
Recommended by friends-Own opinion most important	126	4.690	2.010	100	4.790	2.085	-.362
Seen by few-Seen by Many	124	3.298	1.823	99	3.899	1.925	-2.360 ^b
Calculated purchase-Habitual purchase	122	2.287	1.534	97	2.093	1.202	1.045

^aSignificant at .05 level

^bSignificant at .02 level

TABLE 25.--Value estimates, buying propensity indications, and product perceptions
of chip and dip set priced at \$6.98 and \$7.00.

Question	Odd		Even		z Ratio
	N	Mean	N	Mean	
				St'd Dev.	
Value Estimate	42	5.119	38	4.816	.678
Buying Propensity	42	3.595	38	3.816	-.731
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	41	2.927	37	2.405	1.452
Price no object-Price buyer	40	4.975	37	4.946	.064
Useful-Pleasurable	41	3.000	38	3.237	-.566
It doesn't pay to compare-Comparison shop	40	5.275	36	5.583	-.831
Planned purchase-Impulsive purchaser	40	3.375	36	4.028	-1.324
Durable item-Frequent replacement	41	2.317	36	2.167	.441
Practical-Stylish	41	3.317	37	3.324	-.016
Recommended by friends-Own opinion most important	41	5.707	37	5.378	.870
Seen by few-Seen by Many	40	4.975	37	5.405	-1.094
Calculated purchase-Habitual purchase	39	2.974	36	2.778	.551

TABLE 26.--Value estimates, buying propensity indications, and product perceptions of chip and dip set priced at \$7.98 and \$8.00.

Question	Odd		Even		z Ratio
	N	Mean	N	Mean	
				St'd Dev.	St'd Dev.
Value Estimate	35	5.486	39	4.410	1.891
Buying Propensity	35	3.829	39	3.872	1.572
					2.335 ^a
					-.116
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	33	2.545	36	2.806	1.912
Price no object-Price buyer	33	5.273	37	4.784	2.170
Useful-Pleasurable	35	3.857	37	3.541	2.164
It doesn't pay to compare-Comparison shop	32	5.219	36	5.250	1.622
Planned purchase-Impulsive purchaser	32	3.688	36	3.417	2.100
Durable item-Frequent replacement	35	2.143	36	2.056	1.290
Practical-Stylish	35	3.686	38	3.895	1.971
Recommended by friends-Own opinion most important	34	5.206	38	5.474	1.832
Seen by few-Seen by Many	35	5.200	38	5.895	1.165
Calculated purchase-Habitual purchase	32	2.594	35	2.343	1.433
					.684

^aSignificant at .02 level.

TABLE 27.--Value estimates, buying propensity indications, and product perceptions
of chip and dip set priced at \$8.98 and \$9.00.

Question	Odd		Even		z Ratio
	N	Mean	N	Mean	
				St'd Dev.	St'd Dev.
Value Estimate	36	5.250	36	5.028	1.833
Buying Propensity	36	3.750	36	3.778	1.548
					.444
					-.081
Semantic Differential Scales					
Unnecessary Purchase-Urgent Purchase	35	2.971	36	2.500	1.323
Price no object-Price buyer	34	5.029	35	5.086	1.842
Useful-Pleasurable	35	3.143	36	3.000	1.528
It doesn't pay to compare-Comparison shop	35	5.343	36	5.250	1.722
Planned purchase-Impulsive purchaser	34	3.382	36	3.500	1.878
Durable item-Frequent replacement	35	2.286	36	2.333	1.453
Practical-Stylish	35	3.571	36	3.972	1.803
Recommended by friends-Own opinion most important	35	5.571	36	5.861	1.205
Seen by few-Seen by Many	35	4.829	36	5.250	1.588
Calculated purchase-Habitual purchase	35	2.829	36	2.389	1.439
					1.286

TABLE 28.--Value estimates, buying propensity indications, and product perceptions
of chip and dip set priced at \$7.00 and \$9.00.

Value Estimate Buying Propensity						
	38	4.816	1.985	36	5.028	1.833
	38	3.816	1.354	36	3.788	1.548
						- .471
						.082
Semantic Differential Scales						
Unnecessary Purchase-Urgent Purchase	37	2.405	1.460	36	2.500	1.323
Price no object-Price buyer	37	4.946	2.117	35	5.086	1.842
Useful-Pleasurable	38	3.237	1.979	36	3.000	1.528
It doesn't pay to compare-Comparison shop	36	5.583	1.422	36	5.250	1.722
Planned purchase-Impulsive purchaser	36	4.028	2.291	36	3.500	1.878
Durable item-Frequent replacement	36	2.167	1.555	36	2.333	1.453
Practical-Stylish	37	3.324	1.817	36	3.972	1.803
Recommended by friends-Own opinion most important	37	5.378	1.791	36	5.861	1.205
Seen by few-Seen by Many	37	5.405	1.652	36	5.250	1.588
Calculated purchase-Habitual purchase	36	2.778	1.601	36	2.389	1.439
						1.069

TABLE 29.--Value estimates, buying propensity indications, and product perceptions
of chip and dip set priced at \$6.98 and \$8.98.

Question	Odd		Even		z Ratio		
	N	Mean	St'd Dev.	N		Mean	St'd Dev.
Value Estimate	42	5.119	1.954	36	5.250	2.326	-.263
Buying Propensity	42	3.595	1.310	36	3.750	1.320	-.512
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	41	2.927	1.673	35	2.971	1.558	-.117
Price no object-Price buyer Useful-Pleasurable	40	4.975	1.782	34	5.029	1.932	-.122
It doesn't pay to compare-Comparison shop	41	3.000	1.667	35	3.143	1.588	-.377
Planned purchase-Impulsive purchaser	40	5.275	1.761	35	5.343	1.351	-.186
Durable item-Frequent replacement	40	3.375	1.906	34	3.382	1.985	-.013
Practical-Stylish	41	2.317	1.369	35	2.286	1.343	.098
Recommended by friends-Own opinion most important	41	3.317	1.893	35	3.571	1.729	-.603
Seen by few-Seen by Many	41	5.707	1.469	35	5.571	1.498	.393
Calculated purchase-Habitual purchase	40	4.975	1.753	35	4.829	1.812	.349
	39	2.974	1.423	35	2.829	1.404	.435

TABLE 30.--Value estimates, buying propensity indications, and product perceptions of chip and dip set priced at \$6.98 and \$9.00.

Question	Odd		Even		z Ratio		
	N	Mean	St'd Dev.	N		Mean	St'd Dev.
Value Estimate	42	5.119	1.954	36	5.028	1.833	.209
Buying Propensity	42	3.595	1.310	36	3.778	1.548	-.551
Semantic Differential Scales							
Unnecessary Purchase-Urgent Purchase	41	2.927	1.673	36	2.500	1.323	1.233
Price no object-Price buyer	40	4.975	1.782	35	5.086	1.842	-.261
Useful-Pleasurable	41	3.000	1.667	36	3.000	1.528	---
It doesn't pay to compare-Comparison shop	40	5.275	1.761	36	5.250	1.722	.062
Planned purchase-Impulsive purchaser	40	3.375	1.906	36	3.500	1.878	-.284
Durable item-Frequent replacement	41	2.317	1.369	36	2.333	1.453	-.049
Practical-Stylish	41	3.317	1.893	36	3.972	1.803	-1.533
Recommended by friends-Own opinion most important	41	5.707	1.469	36	5.861	1.205	-.499
Seen by few-Seen by Many	40	4.975	1.753	36	5.250	1.588	-.708
Calculated purchase-Habitual purchase	39	2.974	1.423	36	2.389	1.439	1.745

APPENDIX D

THE RESULTS OF STAGE I RESPONSES TO
PRICE ILLUSION WITHIN SELECTED
DEMOGRAPHIC BREAKS

TABLE 31.---Analysis of subjects' perceived customer role and price illusion.

Subjects' Perceived Buying Role										Even		t or z Ratio
Odd												
	N	Mean	Std. Dev.	T	Mean	Std. Dev.	T	Mean	Std. Dev.			
<u>Carryall Bag</u>												
Own use	65	7.123	2.087	62	7.081	2.135				- .111		
Use of entire family		a			a					a		
Someone else in immediate family	24	7.125	2.088	25	6.520	2.532				1.363		
As a gift	47	6.766	2.065	61	6.377	2.355				.925		
<u>Casual Dress</u>												
Own use	80	4.837	2.070	68	5.544	2.464				-1.858		
Use of entire family		b			b					b		
Someone else in immediate family	19	4.316	2.153	20	4.414	2.026				- .226		
As a gift	31	4.548	2.367	25	4.760	2.045				- .510		
<u>Women's Shorts</u>												
Own use	63	5.340	2.064	74	5.227	2.522				.130		
Use of entire family		b			b					b		
Someone else in immediate family	20	4.467	1.996	32	5.030	2.153				-1.060		
As a gift	34	5.028	2.277	36	5.267	2.227				- .316		
<u>Laundry Cart</u>												
Own use	54	5.667	2.160	57	5.228	2.144				1.064		
Use of entire family	23	5.603	2.317	26	5.721	1.772				- .282		
Someone else in immediate family	25	4.600	1.577	27	5.461	1.873				-2.273 ^c		
As a gift	17	4.706	1.902	23	5.000	2.813				- .575		
<u>Reversible Broiler</u>												
Own use	36	7.104	1.223	26	6.314	2.315				1.751		
Use of entire family	53	6.925	1.681	70	6.522	2.327				1.000		
Someone else in immediate family	11	6.122	1.523	3	5.778	2.620				.577		
As a gift	32	6.281	2.019	42	6.275	2.125				.408		
<u>Cotton Knit Top</u>												
Own use	59	5.203	2.145	64	5.406	1.877				- .552		
Use of entire family		b			b					b		
Someone else in immediate family	39	5.615	2.271	30	5.333	2.123				.547		
As a gift	51	5.333	2.074	53	5.019	1.786				.918		
<u>Cotton Blend Duster</u>												
Own use	68	4.588	1.257	67	4.412	2.414				.446		
Use of entire family				Not appropriate								
Someone else in immediate family	27	4.741	2.119	38	3.570	1.282				3.123 ^d		
As a gift	42	4.810	2.038	49	4.531	2.287				.648		
<u>Cleaning Fluid</u>												
Own use	38	6.342	1.977	24	6.875	2.127				1.410		
Use of entire family	63	6.472	2.211	41	6.341	2.395				- .269		
Someone else in immediate family		a			a					a		
As a gift		b			b					b		

Men's Knit Shirt

Own use	40	5.000	2.145	28	5.143	1.726	- .407
Use of entire family							
Someone else in immediate family	13	5.041	1.813	51	5.079	2.104	- .409
As a gift	42	5.533	2.060	63	5.553	2.107	- .352
"No Turn" Broiler							
Own use	44	6.122	1.812	26	6.590	2.000	-1.417
Use of entire family							
Someone else in immediate family	55	6.031	1.717	53	6.719	1.576	- .342
As a gift	33	6.606	1.701	30	6.633	2.307	- .311
Chip and Dip Set at \$6.98 and \$7.00							
Own use	12	5.845	1.739	12	5.350	2.131	- .117
Use of entire family							
Someone else in immediate family	29	6.034	2.076	29	4.450	1.903	-1.199
As a gift							
Chip and Dip Set at \$7.98 and \$8.00							
Own use	13	4.600	1.630	12	5.000	1.100	-1.101
Use of entire family							
Someone else in immediate family	23	5.722	1.916	23	4.000	1.500	-4.416
As a gift							
Chip and Dip Set at \$8.98 and \$9.00							
Own use	16	4.913	2.627	15	5.067	2.112	- .443
Use of entire family							
Someone else in immediate family	12	5.722	2.067	16	5.106	1.576	-1.500
As a gift							

a. Number of responses insufficient for analysis.

b. None reported.

c. Significant at .05 level.

d. Significant at .02 level.

e. Significant at .01 level.

TABLE 32.--Analysis of the subjects' illusion susceptibility and past buying experience and future purchase expectations.

Past Experience and Future Expectations	Odd				Even				t or z Ratio
	N	Mean	Std Dev.	N	Mean	Std Dev.			
<u>Carryall Bag</u>									
Purchased product	20	7.200	2.293	18	6.944	1.929			.525
Did not purchase	90	6.889	2.068	106	6.472	2.254			1.343
Plan to purchase	17	8.059	1.830	27	7.593	1.968			1.063
Do not plan to purchase	93	6.742	2.099	97	6.247	2.192			1.582
<u>Casual Dress</u>									
Purchased product	45	5.311	2.249	39	5.769	2.402			-.887
Did not purchase	76	4.342	2.125	68	4.779	2.287			-1.175
Plan to purchase	51	5.549	2.172	52	5.846	2.365			-.658
Do not plan to purchase	71	4.155	2.114	56	4.446	2.179			-.751
<u>Womens' Shorts</u>									
Purchased product	36	5.500	2.167	39	5.462	2.951			.063
Did not purchase	72	4.722	1.902	83	5.060	2.153			-1.031
Plan to purchase	44	5.636	2.024	45	5.756	2.531			-.245
Do not plan to purchase	64	4.531	1.994	77	4.870	2.315			-.947
<u>Laundry Cart</u>									
Purchased product		a			a				a
Did not purchase	109	5.239	2.184	119	5.210	2.102			.102
Plan to purchase		a			a				a
Do not plan to purchase	101	5.050	2.060	111	5.126	2.045			-.268
<u>Reversible Broiler</u>									
Purchased product		b			b				b
Did not purchase	99	6.626	1.833	114	6.237	2.311			1.340
Plan to purchase		b			b				b
Do not plan to purchase	92	6.544	1.885	117	6.162	2.279			1.354
<u>Cotton Blend Duster</u>									
Purchased product	32	4.750	1.854	34	4.618	2.474			.243
Did not purchase	79	4.418	1.985	85	3.988	2.078			1.347
Plan to purchase	25	4.520	2.352	34	4.882	2.220			-.895
Do not plan to purchase	86	4.512	1.822	84	3.845	2.135			2.176 ^c
<u>Cotton Knit Top</u>									
Purchased product	35	4.943	1.851	39	5.615	1.969			-1.492
Did not purchase	75	4.387	2.116	85	5.047	1.921			1.052
Plan to purchase	37	5.378	1.950	49	5.571	1.773			-.467
Do not plan to purchase	73	5.178	2.089	72	5.000	2.033			.522

Cleaning Fluid at									
<u>\$.98 and \$1.00</u>									
Purchased product	19	6.684	2.735	20	6.650	2.455		.064	
Did not purchase	58	6.190	2.201	72	6.597	2.059		-1.070	
Plan to purchase	30	7.400	2.332	34	7.206	2.139		.340	
Do not plan to purchase	47	5.617	2.088	57	6.193	2.039		-1.401	
Men's Knit Shirt									
Purchased product	57	5.632	2.066	54	6.019	2.241		- .004	
Did not purchase	62	5.290	2.015	56	5.375	2.200		- .212	
Plan to purchase	57	5.772	2.193	54	6.204	1.889		1.104	
Do not plan to purchase	63	5.206	1.969	57	5.193	2.243		.033	
"Ho Turn" Broiler									
Purchased product		b			b			b	
Did not purchase	119	5.849	1.823	101	5.802	2.097		- .175	
Plan to purchase		b			b			b	
Do not plan to purchase	120	5.792	1.097	97	5.805	2.110		- .122	
Chip and Dip Set at									
<u>\$6.98 and \$7.00</u>									
Purchased product		b			b			b	
Did not purchase	40	5.200	1.065	36	4.933	2.034		.788	
Plan to purchase		b			b			b	
Do not plan to purchase	37	4.246	1.086	30	4.467	1.902		1.056	
Chip and Dip Set at									
<u>\$7.98 and \$8.00</u>									
Purchased product		b			b			b	
Did not purchase	34	5.529	2.018	37	4.405	1.910		2.371 ^d	
Plan to purchase		b			b			b	
Do not plan to purchase	32	5.250	1.871	33	4.242	1.970		2.083 ^c	
Chip and Dip Set at									
<u>\$8.98 and \$9.00</u>									
Purchased product		b			b			b	
Did not purchase	32	5.281	2.294	32	4.906	1.860		.797	
Plan to purchase		b			b			b	
Do not plan to purchase	31	5.290	2.372	33	4.939	1.687		.668	

^aNone reported.

^bNumber of responses insufficient for analysis.

^cSignificant at .05 level.

^dSignificant at .02 level.



TABLE 33.--Illusion susceptibility and educational levels.

Educational Level	Odd			Even			t or z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
<u>Carryall Bag</u>							
Thru high school	49	7.224	2.023	55	6.691	2.097	1.306
Some college	60	6.717	2.176	67	6.448	2.326	.668
<u>Casual Dress</u>							
Thru high school	54	4.907	1.962	48	5.042	2.574	-.291
Some college	67	4.761	2.206	58	5.190	2.232	-1.069
<u>Women's Shorts</u>							
Thru high school	52	5.481	1.896	51	4.784	2.329	1.648
Some college	55	4.582	2.078	71	5.408	2.481	-2.016 ^a
<u>Laundry Cart</u>							
Thru high school	46	5.217	2.303	57	5.351	2.212	-.296
Some college	62	5.258	2.117	65	5.846	2.004	.564
<u>Reversible Broiler</u>							
Thru high school	45	5.889	1.538	58	6.293	2.050	-1.132 ^b
Some college	60	7.183	1.884	65	6.231	2.448	2.428 ^b
<u>Cotton Blend Duster</u>							
Thru high school	48	4.521	2.031	55	4.473	2.263	.112
Some college	61	4.492	1.913	64	3.906	2.141	1.602
<u>Cotton Knit Top</u>							
Thru high school	42	4.929	2.005	61	5.016	1.851	-.221
Some college	67	5.433	2.132	61	5.492	2.030	-.159
<u>Cleaning Fluid at \$.98 and \$1.00</u>							
Thru high school	33	6.364	2.706	37	6.297	2.065	.113
Some college	42	6.405	2.001	54	6.796	2.197	-.900

<u>Men's Knit Shirt</u>							
Thru high school	60	5.650	1.982	43	5.651	2.155	- .002
Some college	59	5.205	2.142	66	5.667	2.142	- .920
<u>"No Turn" Broiler</u>							
Thru high school	58	5.966	1.671	45	5.644	2.035	.851
Some college	68	5.735	1.907	58	5.983	1.537	- .802
Chip and Dip Set at \$6.98 and \$7.00							
Thru high school	20	4.800	1.600	15	4.133	1.893	1.443
Some college	21	5.476	1.991	24	4.958	1.881	1.219
Chip and Dip Set at \$7.98 and \$8.00							
Thru high school	19	6.000	1.974	17	5.118	1.967	1.829 ^a
Some college	17	4.882	1.676	22	3.864	1.632	2.390 ^a
Chip and Dip Set at \$8.98 and \$9.00							
Thru high school	16	5.000	2.345	16	5.188	1.467	- .373
Some college	20	5.450	2.291	20	4.900	2.071	1.148

^aSignificant at .05 level.

^bSignificant at .02 level.

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TABLE 34.--Illusion susceptibility and occupational classification of household head.

Occupational Classification	Odd			Even			t or z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
<u>Carryall Bag</u>							
White collar	47	6.830	2.035	49	6.551	2.408	.608
Blue collar	26	7.038	2.377	25	6.200	1.918	1.999
<u>Casual Dress</u>							
White collar	49	4.429	1.949	46	5.326	2.167	-2.094 ^a
Blue collar	27	4.471	1.797	24	4.833	2.687	-.216
<u>Women's Shorts</u>							
White collar	41	4.732	1.780	53	5.264	2.714	-1.132
Blue collar	29	5.379	1.883	23	4.739	2.250	1.572
<u>Laundry Cart</u>							
White collar	44	5.341	2.163	52	5.211	2.051	.297
Blue collar	25	5.320	2.293	26	5.154	2.381	.380
<u>Reversible Broiler</u>							
White collar	44	6.568	2.199	50	6.260	2.528	.625
Blue collar	21	6.095	1.797	30	6.400	1.977	.762
<u>Cotton Blend Duster</u>							
White collar	43	4.465	1.897	51	3.471	2.363	2.238 ^a
Blue collar	23	4.000	2.000	28	4.429	2.078	-1.046
<u>Cotton Knit Top</u>							
White collar	48	4.917	2.019	48	5.542	2.226	-1.426
Blue collar	21	5.238	2.158	30	4.833	1.695	1.016
<u>Cleaning Fluid at \$.98 and \$1.00</u>							
White collar	30	6.567	2.044	45	7.178	2.079	-1.241
Blue collar	19	5.947	2.502	15	5.933	2.235	.026

<u>Men's Knit Shirt</u>									
<u>White collar</u>									
42	5.310	2.029	53	5.566	2.202	-	.582		
30	5.733	2.220	21	5.714	1.385		.048		
<u>"No Turn" Broiler</u>									
<u>White collar</u>									
57	5.474	1.837	39	5.842	2.146	-	.856		
29	5.820	1.641	22	5.864	1.938	-	.094		
<u>Chip and Dip Set at \$6.98 and \$7.00</u>									
<u>White collar</u>									
17	4.824	1.581	18	5.000	1.915	-	.382		
8	4.875	1.269	10	4.400	2.154		.712		
<u>Chip and Dip Set at \$7.98 and \$8.00</u>									
<u>White collar</u>									
15	5.400	1.332	19	3.842	1.694		3.533 ^b		
5	6.400	1.855	10	5.800	1.939		.738		
<u>Chip and Dip Set at \$8.98 and \$9.00</u>									
<u>White collar</u>									
12	5.833	2.230	12	4.667	1.972		1.887		
7	4.286	2.119	11	5.273	1.710		-1.408		

^aSignificant at .05 level.

^bSignificant at .01 level.

TABLE 35.--Illusion susceptibility and working female head of household.

Wife's Work Status	Odd			Even			t or z
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
<u>Carryall Bag</u>							
Wife does not work	56	7.176	2.103	64	6.172	2.295	2.442 ^a
Wife does work	46	6.848	2.146	52	6.885	2.136	.085
Wife works full time	30	7.000	1.880	32	6.938	1.919	.126
<u>Casual Dress</u>							
Wife does not work	59	4.559	2.360	57	4.982	2.351	-.959
Wife does work	55	4.982	2.023	43	5.372	2.459	-.832
Wife works full time	38	4.895	2.100	24	5.042	2.150	-.381
<u>Women's Shorts</u>							
Wife does not work	52	5.404	1.944	66	4.970	2.303	1.100
Wife does work	48	4.625	2.118	50	5.440	2.586	-1.692
Wife works full time	29	4.759	1.774	33	5.485	2.595	-1.887
<u>Laundry Cart</u>							
Wife does not work	54	5.019	2.068	65	5.108	2.128	-.229
Wife does work	47	5.489	2.360	51	5.294	2.136	.423
Wife works full time	30	5.500	2.125	32	5.219	2.088	.516
<u>Reversible Broiler</u>							
Wife does not work	50	6.460	1.723	67	6.493	2.083	-.093
Wife does work	47	6.809	2.069	51	6.000	2.489	1.737
Wife works full time	34	7.088	2.049	28	6.607	2.059	1.294
<u>Cotton Blend Duster</u>							
Wife does not work	59	4.508	2.134	59	4.395	2.077	.519
Wife does work	43	4.581	1.794	55	3.982	2.416	1.394 ^b
Wife works full time	28	4.786	1.780	34	3.765	2.289	2.743 ^b
<u>Cotton Knit Top</u>							
Wife does not work	60	5.233	2.003	58	4.759	1.784	1.347
Wife does work	42	5.381	2.058	57	5.737	2.107	-.833
Wife works full time	28	5.464	1.918	35	5.886	2.011	-1.167



TABLE 36.--Illusion susceptibility and marital status.

Marital Status	Odd				Even				t or z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	N	Mean	St'd Dev.
<u>Carryall Bag</u>									
Single	24	6.125	1.810	18	6.278	2.468			-.331 ^a
Married	76	7.197	2.177	99	6.525	2.190			2.007 ^a
<u>Casual Dress</u>									
Single	21	4.238	2.287	20	5.950	2.291			-3.532 ^b
Married	93	4.656	2.133	79	4.962	2.384			-.875
<u>Women's Shorts</u>									
Single	25	5.040	2.088	18	5.000	2.000			.088
Married	79	4.949	2.012	93	5.032	2.416			-.244
<u>Laundry Cart</u>									
Single	21	5.429	2.129	21	5.286	1.855			.320
Married	79	5.291	2.285	95	5.147	2.191			.419
<u>Reversible Broiler</u>									
Single	21	6.952	1.759	21	6.190	2.107			1.733
Married	75	6.520	1.872	97	6.258	2.281			.822
<u>Cotton Blend Duster</u>									
Single	22	5.182	1.898	19	4.632	2.133			1.209
Married	81	4.296	1.934	92	4.011	2.179			.906
<u>Cotton Knit Top</u>									
Single	20	5.600	2.354	23	5.089	1.412			1.200
Married	84	5.167	2.011	90	5.078	1.996			.291
<u>Cleaning Fluid at \$.98 and \$1.00</u>									
Single	14	6.071	1.033	15	5.800	2.135			.556
Married	57	6.491	2.465	69	6.812	2.149			-.764

<u>Men's Knit Shirt</u>							
Single	20	6.050	1.717	22	5.773	2.152	.627
Married	93	5.366	2.179	79	5.684	2.120	-.962
<u>"No Turn" Broiler</u>							
Single	21	6.381	1.463	21	6.333	1.727	.120
Married	102	5.735	1.868	71	5.634	2.071	.326
<u>Chip and Dip Set at \$6.98 and \$7.00</u>							
Single	9	5.778	2.572	7	4.857	2.416	1.080
Married	31	4.839	1.706	30	4.700	1.810	.303
<u>Chip and Dip Set at \$7.98 and \$8.00</u>							
Single	5	4.800	.748	6	3.833	1.067	1.504 ^b
Married	26	5.808	2.167	30	4.600	2.043	3.055 ^b
<u>Chip and Dip Set at \$8.98 and \$9.00</u>							
Single	6	6.000	2.082	9	5.444	1.892	.700
Married	29	5.207	2.310	23	4.957	1.829	.606

^aSignificant at .05 level.

^bSignificant at .01 level.

TABLE 37.--Illusion susceptibility and age.

Age	Odd			Even			t or z
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	
<u>Carryall Bag</u>							
Age 20-34	59	6.881	2.248	56	6.339	2.332	1.257
Age 35-49	25	7.120	2.104	36	6.667	2.134	1.175
Age 50 +	23	7.000	1.818	30	6.700	2.019	.764
<u>Casual Dress</u>							
Age 20-34	60	4.283	2.017	54	5.130	2.457	-1.981a
Age 35-49	33	5.455	2.231	27	5.259	2.397	.489
Over 50	28	4.893	2.512	23	5.348	1.996	-1.050
<u>Women's Shorts</u>							
Age 20-34	53	4.925	1.931	62	5.161	2.424	-.576
Age 35-49	31	4.774	1.913	29	5.138	2.825	-.903
Over 50	22	5.091	2.193	30	5.033	2.008	.140
<u>Laundry Cart</u>							
Age 20-34	54	5.463	2.123	62	5.306	2.099	.396
Age 35-49	25	5.440	2.385	35	5.000	2.230	1.091
Over 50	28	4.607	2.059	24	5.000	1.756	-1.000
<u>Reversible Broiler</u>							
Age 20-34	53	6.925	1.902	61	6.623	2.302	.302
Age 35-49	27	6.259	1.878	33	6.273	2.260	-.037
Over 50	24	6.500	1.500	28	5.643	2.057	.376
<u>Cotton Blend Duster</u>							
Age 20-34	52	4.162	1.809	62	3.903	2.061	.708
Age 35-49	30	4.833	2.018	30	3.833	1.845	1.970a
Over 50	27	4.481	1.792	25	4.960	2.537	-1.154
<u>Cotton Knit Top</u>							
Age 20-34	53	5.396	2.326	64	5.453	1.845	-.144
Age 35-49	28	4.857	2.030	32	5.281	2.154	-1.113
Over 50	28	5.321	1.364	24	4.625	2.108	1.878

Cleaning Fluid at \$.98 and \$1.00									
Age 20-34	44	6.636	2.154	42	7.381	2.104	-1.601 ^a		
Age 35-49	17	7.000	2.223	25	5.960	2.341	2.132 ^a		
Over 50	13	4.615	2.403	24	5.958	2.589	-2.388 ^a		
Men's Knit Shirt									
Age 20-34	52	5.558	2.170	62	5.565	2.175	- .012		
Age 35-49	36	5.583	1.963	24	5.333	1.863	.673		
Over 50	30	5.100	2.055	22	6.136	2.222	-2.482 ^a		
"No Turn" Broiler									
Age 20-34	63	6.079	1.665	52	6.000	2.043	.222		
Age 35-49	37	5.405	1.652	23	5.606	2.335	-.775		
Over 50	24	5.583	2.137	28	5.607	1.858	-.060		
Chip and Dip Set at \$6.98 and \$7.00									
Age 20-34	19	5.474	2.061	19	4.947	1.959	1.115		
Age 35-49	14	4.420	1.635	10	4.300	1.735	.230		
Over 50	8	5.315	1.996	7	4.714	1.906	.851		
Chip and Dip Set at \$7.98 and \$8.00									
Age 20-34	22	5.591	1.899	19	4.474	1.902	2.523 ^a		
Age 35-49	6	5.833	2.478	12	4.333	2.247	1.855		
Over 50	7	4.857	1.726	9	4.375	1.111	.733		
Chip and Dip Set at \$8.98 and \$9.00									
Age 20-34	20	5.550	2.109	16	4.625	1.833	1.902		
Age 35-50	8	5.750	2.222	8	5.625	2.058	.160		
Over 50	8	4.000	2.500	10	5.000	1.549	-1.416		

^aSignificant at .05 level.

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TABLE 38.--Illusion susceptibility and income.

Income	Odd				Even				t or z Ratio
	N	Mean	St'd Dev.	N	Mean	St'd Dev.	N	Mean	
<u>Carryall Bag</u>									
To \$5,999	27	6.556	1.813	29	6.724	2.242			- .168
\$6,000 to \$9,999	39	6.821	2.286	41	6.707	1.864			.241
Over \$10,000	41	7.317	2.191	50	6.340	2.487			1.970 ^a
<u>Casual Dress</u>									
To \$5,000	31	4.581	2.380	24	5.333	2.494			-1.742
\$6,000 to \$9,999	39	4.769	2.166	40	5.150	1.975			- .806
Over \$10,000	49	4.694	2.140	40	4.800	2.492			- .210
<u>Women's Shorts</u>									
To \$5,999	29	4.931	2.258	27	4.741	2.576			.449
\$6,000 to \$9,999	33	5.515	1.811	44	4.773	2.235			1.587 ^b
Over \$10,000	43	4.578	1.820	47	5.723	2.400			-2.498 ^b
<u>Laundry Cart</u>									
To \$5,999	32	4.875	2.093	23	5.043	1.756			- .432
\$6,000 to \$9,999	38	5.395	2.230	42	5.262	2.050			.275
Over \$10,000	36	5.389	2.227	55	5.182	2.257			.426
<u>Reversible Broiler</u>									
To \$5,999	27	6.593	1.616	28	5.857	2.150			1.950
\$6,000 to \$9,999	38	6.474	1.788	40	6.600	2.095			- .283
Over \$10,000	39	6.744	2.083	50	6.240	2.422			1.041
<u>Cotton Blend Duster</u>									
To \$5,999	31	4.452	2.061	24	4.292	2.245			.395
\$6,000 to \$9,999	42	4.333	2.043	36	4.528	2.279			- .390
Over \$10,000	34	4.647	1.643	57	3.947	2.131			1.734
<u>Cotton Knit Top</u>									
To \$5,999	27	5.111	1.969	29	4.897	1.709			.581
\$6,000 to \$9,999	31	5.452	2.138	49	5.286	2.030			.340
Over \$10,000	48	5.140	2.033	43	5.488	2.004			- .896

APPENDIX E

INSTRUCTIONS AND FORMS USED IN

STAGE II STUDY

ODD-EVEN RETAIL PRICE STUDY

I. PURPOSE

The purpose of this study is to gather information about the response of customers to odd and even retail price endings (i.e., merchandise priced at \$6.98 versus \$7.00). The results gathered from the study will then be used to guide buyers, and other interested individuals in the value and appropriateness of alternative retail price endings.

II. PROCEDURES

The study will be conducted for a four-week period; beginning on Monday morning, May 1, 1967, and will extend through the close of business Saturday, May 27, 1967.

The total study involves several representative items which will be carried in all BURDINE'S stores. During the period of the study, the prices of the affected items will be adjusted between odd and even prices on a scheduled basis which will be furnished you.

The significant thing to remember is that the price of an item will not necessarily change every week. Therefore, it is possible for the price of an item to be the same for two consecutive weeks.

The study simply requires two basic demands of the Department Managers. The first is that each Department Manager make the appropriate price changes when scheduled to do so. The study will also require in some cases that the Department Manager weekly establish the sales and ending stock of the item, and report these figures to the Main Store Department Buyer representative.

In the event that any questions or problems with regard to the study should arise, please call the appropriate Main Store Department Buyer.

CHECKLIST FOR DEPARTMENT MANAGERS

(FOR DEPARTMENTS USING PERPETUAL INVENTORY CONTROL)

All demands required for the effective conduct of the study can be most easily summarized into the following checklist of do's and don'ts.

DO'S

1. Establish exactly what item or items included in the study fall within your area of responsibility.
2. Determine the exact beginning stocks on the selling floor and in the receiving room for the start of business Monday, May 1, 1967.
3. If any items are received during the week, please be certain that they are marked at the same price ending as the merchandise on the selling floor.
4. Have appropriate counter sign and item price tickets available by Monday morning in the event that a price change for the following week becomes necessary.
5. Keep list of returns of the item(s) and the price at which the sale was made. If possible, also attempt to determine the date of purchase and enter on page 2 of "Odd-Even Study Price Schedule."
6. Each Monday morning determine the appropriate price ending for the coming week.
7. Each Monday morning make necessary item price ticket and counter sign changes. (Note: Please be

certain that the merchandise in the receiving room as well as on the selling floor is adjusted.)

DON'TS

1. Don't alter the location or amount of display space devoted to the item during the four-week test period.
2. Don't devote unusual selling effort to the item, (i.e., neither single out the item for special promotion or stress, nor neglect the item if it has been the usual practice of the sales staff to include mention of the item to a customer when a related item is purchased).
3. Don't include mention of the price changes in the sales presentation of the item to a customer.
4. Don't pencil price changes on tickets which will also show the old price.

At the completion of the study on Monday a.m., May 29:

1. Return to the main store Department Buyer the "Odd-Even Study Price Schedule" with the sheet listing any returns of the item.
2. Convert the price of the item to its original before-study retail price ending.

CHECKLIST FOR DEPARTMENT MANAGERS

(USING STOCK COUNTS FOR SALES DETERMINATION)

All demands required for the effective conduct of the study can be most easily summarized into the following checklist of do's and don'ts:

DO'S

1. Establish exactly what item or items included in the study fall within your area of responsibility.
2. Determine the exact beginning stocks on the selling floor and in the receiving room for the start of business Monday, May 1, 1967, and for each subsequent Monday of the study period.
3. Keep track of all receivals or transfers of the item during the week, and be certain that they are appropriately entered in the stock records.
4. If any items are received during the week, please be certain that they are marked at the same price ending as the merchandise on the selling floor.
5. Have appropriate counter sign and item price tickets available by Monday morning in the event that a price change for the following week becomes necessary.
6. Keep list of returns of the item(s) and the price at which return was made. If possible, also attempt to determine the date of purchase.

7. Each Monday morning determine sales of the item for the prior week by the procedure indicated on the attached form "Determination of Odd-Even Stock/Sales Form."

8. Each Monday morning arrange to have resulting sales and ending stock for each week reported to the appropriate main store Department Buyer or his representative.

9. Each Monday morning determine the appropriate price ending for the coming week.

10. Each Monday morning make necessary item price and counter sign changes. (Note: Please be certain that the merchandise in the receiving room as well as on the selling floor is adjusted.)

DON'TS

1. Don't alter the location or amount of display space devoted to the item during the four-week test period.

2. Don't devote unusual selling effort to the item, (i.e., neither single the item out for special promotion or stress, nor neglect the item if it has been the usual practice of the sales staff to include mention of the item when related merchandise is purchased).

3. Don't include mention of the price changes in the sales presentation of the item to a customer.

4. Don't pencil price changes nor clip tickets--the preparation of new tickets is necessary when price changes go into effect.

At the completion of the study, on Monday a.m., May 29:

1. Return to the main store Department Buyer the "Determination of Odd-Even Stock/Sales Form."

2. Convert the price of the item to its original before-study retail price ending.

CHECKLIST FOR DEPARTMENT BUYERS
(USING PERPETUAL INVENTORY CONTROLS)

DO'S

1. Each Monday morning when the sales for the past week become available, complete the "Odd-Even Perpetual Sales/Stock Determination Form" for each store.
2. Each Monday morning indicate to the Department Manager of each store the appropriate price of the item for the following week.
3. Maintain an adequate stock level of the item in each store.
4. When the opportunity allows, check to insure that the Department Manager is conforming to the prescribed plan, with regard to the price and display of the item.
5. Be certain that all reorders, transfers, etc. are entered on the stock control book before completing the "Odd-Even Perpetual Sales/Stock Determination Form."

DON'TS

1. Don't markdown the merchandise for promotions or clearance.
2. Don't alter the display of the item during the study period.
3. Don't advertise the merchandise during the study period.

At the completion of the study on Monday, a.m., May 29:

1. Collect the "Odd-Even Study Price Schedules" which are to be returned from each store by the various Department Managers.
2. Retain for pickup the six "Odd-Even Study Price Schedules" and the "Odd-Even Perpetual Sales/Stock Determination Form."

In the event of any questions or problems call collect: David Georgoff, Boca Raton, 395-9141.

CHECKLIST FOR DEPARTMENT BUYERS
(USING STOCK COUNTS FOR SALES DETERMINATION)

DO'S

1. Each Monday morning arrange to have someone request of the Department Manager of each store the sales and ending stock of each item, which is to be entered on the enclosed "Odd-Even Sales/Stock Report Form."

2. Each Monday morning indicate to the Department Manager of each store the appropriate price of the item for the following week.

3. Maintain an adequate stock level of the item in each store.

4. When the opportunity allows, check to insure that the Department Manager is conforming to the prescribed plan, with regard to the price and display of the item.

DON'TS

1. Don't markdown the merchandise for promotions or clearance.

2. Don't alter the display of the item during the study period.

3. Don't advertise the merchandise during the study period.

At the Completion of the study on Monday a.m., May 29:

1. Collect the "Determination of Odd-Even Stock/Sales Form" which is to be returned from each store by the various Department Managers.

2. Retain for pickup the six "Determination of Odd-Even Stock/Sales Forms" and the master "Odd-Even Sales/Stock Report Form."

ODD-EVEN STUDY PRICE SCHEDULE

Store _____ Department _____

Item _____

WEEK 1 May 1 thru 6

Price _____

WEEK 2 May 8 thru 13

Price _____

WEEK 3 May 15 thru 20

Price _____

WEEK 4 May 22 thru 27

Price _____

WEEK 5 May 29 on

Price _____

Note: Post merchandise returns individually on page 2 of this schedule. After the completion of the test, Monday a.m., May 27, please return this schedule and the attached merchandise return sheet to the appropriate main office Department Buyer.

MERCHANDISE RETURNS

Store _____ Department _____

Item _____

(Note: Please list merchandise returns individually.)

<u>Date of</u> <u>Return</u>	<u>Purchase</u> <u>Price</u>	<u>Date of Purchase</u> <u>(if possible)</u>	<u>Store Where Purchase</u> <u>Made (if possible)</u>
---------------------------------	---------------------------------	---	--

DETERMINATION OF ODD-EVEN STOCK/SALES FORM

Store _____ Department _____

Item _____

WEEK _____ Price for week _____

(A) Beginning Stock on Hand, Monday a.m., May _____

Plus: Reorders received during week _____

Plus: Transfers in, made during week _____

(B) Total: Merchandise available for sale _____

(C) Ending inventory Saturday p.m., May _____
(Include customer returns made during week) _____

Plus: Transfers out _____

Plus: Damaged and soiled stock etc.
removed during week from inventory or
returned to manufacturer. _____

(D) Total: Merchandise accounted for at
end of week. _____

Total sales for week (Subtract D from B). _____

(Note: Post customer returns of item for week on page 3
of this report. Detail returns individually when
reporting to main store Buyer.)

WEEK _____ Price for week _____

(A) Beginning Stock on Hand, Monday a.m., May _____
(Note: Beginning stock is equal to
line C above--the ending stock for
past week) _____

Plus: Reorders received during week _____

Plus: Transfers in made during week _____

(B) Total: Merchandise available for sale _____

(C) Ending inventory Saturday p.m., May____
(Include customer returns made
during week)

Plus: Transfers out

Plus: Damaged and soiled stock etc.
removed during week from inventory or
returned to manufacturer.

(D) Total: Merchandise accounted for at
end of week.

Total Sales for week (subtract D from B).

ODD-EVEN SALES/STOCK REPORT FORM

Item _____ Department _____

WEEK ____ (May -)

Store	Price	Weekly Sales	Ending Stock	Weekly Returns
1				
2				
3				
4				
5				
6				

(Note: Record returns for week individually on Sheet 3)

WEEK ____ (May -)

Store	Price	Weekly Sales	Ending Stock	Weekly Returns
1				
2				
3				
4				
5				
6				

(Note: Record returns for week individually on Sheet 3)

APPENDIX F

ANALYSIS OF VARIANCE AND
COVARIANCE TABLES FOR
STAGE II RESULTS

TABLE 39.--Woman's Cotton Knit Top: Analysis of covariance of sales (y),
adjusting for variations in merchandise available for sale (x).

Source of Variation	DF	Sum of Squares and Cross Products		Deviation from Regression		F ratio
		Σx^2	Σxy	Σx^2	Sum of Squares DF	Mean Square
Total	23	15765.3	962.5	240.6		
Store	5	14785.8	852.8	125.4		
Weeks	3	752.3	17.2	12.4		
Treatments	1	24.0	(3.0)	.4		
Error	14	203.2	95.5	102.4	57.5	13 4.4
Treatment plus error	15	227.2	98.5	102.8	60.1	14
Adjustment treatment means					2.6	1 2.6 .591

TABLE 40.--Casual Dress: Analysis of variance of sales.

Source of Variance	Sum of Squares	Df	Mean Square	F ratio
Total	31.4	15		
Stores	7.2	3		
Weeks	12.7	3		
Treatments	.025	1		
Error	36.9	8	4.6	.005

TABLE 41.--Women's Shorts: Analysis of variance of sales.

Source of Variation	Sum of Squares	Df	Mean Square	F ratio
Total	155.6	23		
Store	101.4	5		
Weeks	11.5	3		
Treatment	3.4	1	3.4	1.195
Error	39.4	14	28.2	

TABLE 42.--Cleaning Fluid: Analysis of variance of sales.

Source of Variation	Sum of Squares	Df	Mean Square	F ratio
Total	1267.3	23		
Store	688.8	5		
Weeks	96.3	3		
Treatment	42.6	1	42.6	1.357
Error	439.6	14	31.4	

TABLE 43.--Men's Knit Shirt: Analysis of covariance of sales (y), adjusting for variations in merchandise available for sale (x).

Source of Variation	DF	Sum of Squares and Cross Products		Deviation from Regression		F ratio
		Σx^2	Σxy	Σy^2	Sum of Squares	Mean Square
Total	23	253117.0	17861.4	3795.6		
Stores	5	167616.8	11327.7	1969.4		
Weeks	3	19527.5	4593.9	413.8		
Treatments	1	715.1	212.9	63.4		
Error	14	65257.6	1726.9	1349.0	1303.3	100.3
Treatment plus error	15	65972.7	1939.8	1412.4	1355.4	14
Adjusted treatment means					52.1	1 52.1 .519

TABLE 44.--Laundry Cart: Analysis of variance of sales.

Source of Variation	Sum of Squares	Df	Mean Square	F ratio
Total	24.0	23		
Stores	8.0	5		
Weeks	1.0	3		
Treatments	.2	1	.2	
Error	14.8	14	1.1	.189

TABLE 45.--"No Turn" Broiler: Analysis of covariance of sales (y), adjusting for variations in merchandise available for sale (x).

Source of Variation	DF	Sum of Squares and Cross Products			Deviation from Regression			F ratio
		Σx^2	Σxy	Σy^2	Sum of Squares	DF	Mean Square	
Total	23	319.3	66.3	33.8				
Stores	5	182.8	40.6	17.8				
Weeks	3	59.3	4.6	2.8				
Treatments	1	2.6	1.3	.6				
Error	14	74.6	19.8	12.6	7.3	13	.6	
Treatment plus error	15	77.2	21.1	13.2	7.4	14		
Adjusted treatment means					.1	1	.1	.167

TABLE 46.--Reversible Broiler: Analysis of variance of sales.

Source of Variance	Sum of Squares	Df	Mean Square	F ratio
Total	37.0	23		
Stores	17.8	5		
Weeks	10.2	3		
Treatments	.4	1	.4	
Error	8.6	14	.6	.667

TABLE 47.--Cotton Blend Duster: Analysis of covariance of sales (y), adjusting for variations in merchandise available for sale (x).

Source of Variation	DF	Sum of Squares and Cross Products			Deviation from Regression		
		Σx^2	Σxy	Σy^2	Sum of Squares	DF	Mean Square
Total	23	2517.8	434.3	333.3			
Stores	5	943.8	334.6	121.8			
Weeks	3	1334.1	72.5	98.3			
Treatments	1	66.6	43.3	28.1			
Error	14	173.3	(16.1)	85.1	83.6	13	6.4
Treatment plus error	15	239.9	27.2	113.2	110.1	14	
Adjusted treatment means					26.5	1	26.5
							4.141

TABLE 48.--Carryall Bag: Analysis of covariance of sales (y), adjusting for variations in merchandise available for sale (x).

Source of Variation	DF	Sum of Squares and Cross Products			Deviation from Regression		
		Σx^2	Σxy	Σy^2	Sum of Squares	DF	Mean Square
Total	23	47471.6	7513.2	3131.8			
Stores	5	37877.9	5682.2	1031.3			
Weeks	3	1319.4	(153.3)	19.5			
Treatments	1	477.0	312.0	204.1			
Error	14	7797.3	1672.3	1876.9	1518.2	13	116.8
Treatment plus error	15	8274.3	1984.3	2081.0	1605.1	14	
Adjusted treatment means					86.9	1	86.9
							.744

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