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THE ROLE OF PRICE

IN PERCEPTION OF PRODUCT QUALITY

by

Jyrki Tapio Penttinen

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Business Administration)
in The University of Michigan
1976

Doctoral Committee:

Professor James R. Taylor, Chairman
Professor Clyde H. Coombs
Assistant Professor John A. Fossum
Professor Martin R. Warshaw

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Any errors or omissions are the sole responsibility of the author.

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CHAPTER I

INTRODUCTION

The effect of price on consumer's behavior has intrigued analysts of consumer behavior since Veblen's time. It has been submitted, among other proposals, that a high price on a product may induce suppositions of high quality. This proposal is of lively interest to the economists whose demand functions exhibit price as the most important variable determining demand. Also, the proposal is an essential hypothesis to those marketing scholars and practitioners who are interested in product pricing.

Objectives of Dissertation

This study analyzes the role of price in the process of quality perception by consumers. The author hopes to contribute to available knowledge by attempting to:

1. Develop a fuller picture of what constitutes the perceptual process of quality judgment by consumers in terms of information cues and purchase situational factors.

2. Identify relationships that may exist between information cues and quality perceptions by consumers in different judgment situations.

3. Develop a comprehensive experimental design for analyzing the relationship between price and perceived product quality.

4. Collect empirical data and use it to test the role of price and of Consumer Reports quality ratings on perceived quality in various experimental purchase situations.

Need for Research

Current pricing models have their theoretical underpinnings in classical demand theory. This theory specifically excludes the possibility of a price-quality relationship by assuming that buyers act with certainty, i.e. they are perfect judges of quality, who have perfect information concerning products' characteristics. If a positive price-quality relationship existed in the real world segments of the traditional downward sloping demand curve could be replaced by a curve with a positive slope. This possibility would have profound implications for product

pricing.

The results of the research on the price-quality relationship to date are contradictory. This may have been caused by the limited experiments of the past studies and, in some cases, by the unrealistic laboratory procedures that were used to collect empirical data. At the same time the past studies have worked largely without any theoretical basis for analyzing the relationship.

Some of the results of the past analyses point out a possibility that some contradictions might be resolved by more careful analyses of the cognitive process of quality perception and the role of information cues in it. This study makes such an attempt by drawing on some models and theories of information selection and processing. The presented theoretical considerations are formulated as hypotheses within an extensive experiment. Empirical tests of the hypotheses are made to develop a more comprehensive explanation of the price-quality relationship.

Overview of Chapters

Chapter II will present the problem setting: the relationship between price and quality. The implications of the relationship to demand theory and to price setting are discussed. Past research on the relationship is also reviewed.

A concise conceptual framework of the process of quality perception is developed in Chapter III. Factors that affect the role of price in perception of quality are discussed and a set of general hypotheses are formulated for empirical testing.

Chapter IV explains the experimental design and data collection instrument and procedures that were used in the study.

Chapter V summarizes the data analysis techniques and presents the results of the analyses.

A discussion of the results and their meaning to the price-quality relationship is presented in Chapter VI, together with a discussion of the implications of the findings for price setting.

The main facets of the study and its findings are summarized in Chapter VII.

CHAPTER II

PROBLEM SETTING: THE PRICE - PERCEIVED QUALITY RELATIONSHIP

In an early discussion about possible deficiencies of the traditional demand theory Scitovszky noted that the continuing technical and economic development has flooded the markets with products whose quality is difficult to judge.[1] He hypothesized that in certain purchase situations, even where the consumer has available complete information concerning product characteristics, he may not be able to form judgments regarding quality. In such situations the consumer may rely on price, trade mark, store reputation, etc., as predictors of product quality.

---

[1] Tibor Scitovszky, "Some Consequences of the Habit of Judging Quality by Price", The Review of Economic Studies (2), No. 32 (1944 - 1945), pp. 100 - 105.

Even if brand name, store reputation, etc., would have an effect on perceived quality, and on demand, the effects would only complement current pricing theory. The traditional downward sloping demand curve, however, which is the backbone of pricing theory, may not apply at all to situations where consumers utilize price as a cue of quality. The demand curve, rather, could have a positive slope within some ranges of price: a Veblenian type of demand curve but without conspicuous consumption.[2]

Traditional demand and pricing theories are deterministic. They usually assume that the consumers act with certainty, i.e., that the consumers are perfect judges, who have available perfect information. This is a tremendous simplification. In real purchase situations the consumer considers price in conjunction with other product characteristics in the assessment of the product's relative appeal. Usually the consumer does not have complete product information, neither is he an expert in judging the product. Rather, he may be sufficiently uncertain of his ability to judge the product that he utilizes price as a cue of quality.

---

[2] Thorstein Veblen, The Theory of the Leisure Class (New York: The Macmillan Company, 1899). For other possible causes of positively sloped segments in demand curves see H. Leibenstein, "Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand", Quarterly Journal of Economics 64 (May 1950), pp. 183 - 207.

Deterministic demand theory applies well only to demand analyses of identical products. According to the theory, price setting is easy because the prices of competing products must be identical; otherwise, the "perfectly knowledgeable" consumers would all buy the lowest priced of the identical products. Price setting is a more important variable in the producer's marketing mix when his product is differentiated from competing products. In this case there is no binding common market price, but the producer can price his product with some liberty.

In the case of uncertainty the possible existence of a positive price-quality relationship considerably relaxes the constraints of price setting. Even identical products could be priced differentially, and an increase in price does not necessarily decrease demand. Consequently, price becomes a most important variable in the marketing mix when the products are not identical and when the consumers face uncertainty. Figure 1 represents the importance of pricing in different market situations and certainty conditions.

It is only during the last decade or so that the serious attention of marketing researchers has been directed to the role of price in the consumer's judgment of product quality. This is in contrast to both the continuing discussion of pricing in marketing literature, and the importance that economists place on price as the sole variable determining demand.

MARKET SITUATION	CERTAINTY	UNCERTAINTY
IDENTICAL PRODUCTS	PRICING NOT IMPORTANT Identical Prices	Prices may be non-identical
NON-IDENTICAL PRODUCTS	Prices may be non-identical	PRICING VERY IMPORTANT
	PRICE-QUALITY RELATIONSHIPS CAN NOT EXIST	PRICE-QUALITY RELATIONSHIPS MAY EXIST

Figure 1

The Relative Importance of Product Pricing in Different Market Situations and Under Different Certainty Conditions

Scitovszky submitted the hypothesis of the existence of the price-quality relationship. Subsequent scholars have discussed on a conceptual basis the need to recognize the relationship in price setting.[3] Yet, first substantive empirical studies were published only in the late 1960's.

Review of Past Research on the Price - Quality Relationship

The empirical studies that have investigated the price-perceived quality relationship can be classified according to the number of information cues used in the experiment --- price alone, or price together with some other cue --- and the type of product samples shown to the subjects. Four distinct types of product samples have been used: imaginary, identical, and non-identical products, and a combination of both identical and non-identical products. The early studies used imaginary product samples and studied price as the only information cue of quality. The type of experiment of past research has changed over time as shown in Figure 2.

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[3] Joel Dean, Managerial Economics, (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1951) p. 181 ; Edward R. Hawkins, "Price Policies and Theory", Journal of Marketing, 18 (January 1954), pp. 233 - 240; Benson P. Shapiro, "The Psychology of Pricing", Harvard Business Review, 46 (July - August 1968), pp. 14 - 25, 160.

TYPE OF PRODUCT SAMPLES USED	NUMBER OF INFORMATION CUES: ONE (Price)	NUMBER OF INFORMATION CUES: TWO (Price + Other)
IMAGINARY	Leavitt (1954) Tull et al. (1964) Gabor et al. (1966) Monroe et al. (1969, 1971) Lambert (1970)	
IDENTICAL	McConnell (1968)	Enis et al. (1969) Gardner (1970, 1971)
NON-IDENTICAL	Andrews et al. (1970, 1971) Shapiro (1970)	Rao (1970)
BOTH IDENTICAL AND NON-IDENT.		Jacoby et al. (1971)

Figure 2

Classification of Past Research According to the Type of Experiment.
(References to these studies are given later in the text.)

All of the past studies used experimental purchase situations and varied substantially in the degree of realism that could be attributed to the purchase situation and the judgment task. The following review classifies the studies into the blocks of Figure 2, and discusses the experiments and the findings.

Studies Which Employed Imaginary Product Samples

Scitovszky's main concern was with the influence of price on demand. Consequently, the early empirical researchers hypothesized that in certain purchase situations consumers would choose higher priced products and, perceived quality would mediate the strength of preference for expensive products. The experiments of these studies were built on the observaton that product preference is formed on the basis of both price (P) and perceived quality (PQ):

[1] Preference = f (P, PQ)

Leavitt set out to find the values of perceived quality in equation [1] for which a high price would be preferred.* He first tried to find products that are perceived as either identical or non-identical in quality. To this end, a list of fifteen household products in the price range of $0.50 to $1.00 --- products like aspirin tablets, bacon, hand towels,

---

* Harold J. Leavitt, "A Note on Some Experimental Findings About the Meanings of Price, Journal of Business, (July 1954), pp. 205 - 210.

ice cream, bobby pins, deodorants, floor wax, razor blades, etc. --- was given to a small convenience sample of subjects. The subjects were asked to place five of the products in each of three categories: (1) 'all brands pretty much alike', (2) 'big quality differences from brand to brand', (3) 'in between'. The results were found to be consistent. Cooking sherry and moth flakes were placed in the "all alike" category by most of the subjects, while razor blades and floor wax took top honors in the "considerable difference" category. These four products, two from each of the extreme categories were selected for further work.

Leavitt then selected a new sample of 30 Air Force officers and 30 graduate students, and presented the subjects with a hypothetical purchase situation, in which they had to choose between two differentially priced brands of the four products. No product information was supplied to the subjects other than price. The subjects' choices were recorded. They were also asked to indicate the degree of satisfaction with their choice. The results indicated that the subjects tended to be less satisfied when choosing the lower priced product. They tended to choose the higher priced product when the product alternatives were considered heterogeneous in quality, and/or when the price differential was large.

Tull and his associates explored the results obtained by Leavitt with an almost identical experimental design.[5] They gathered data from 110 subjects using four products. In their study, brands of aspirin and table salt were found most similar by the subjects, while floor wax and liquid shampoo were least similar. Their data supported Leavitt's results.

In a similar study, Lambert found that for 200 undergraduates the frequency of choosing higher priced products was positively correlated with perceived variations in products' quality ($r = 0.86$, $p < 0.05$) and subjects' perceived ability to judge quality ($r = 0.82$, $p < 0.05$).[6]

The results of the early studies lend support to the law of demand. This law states that a person will choose the lowest priced product from a set of identical products.[7] The findings also suggest that if the products are perceived to be different in quality, not all people will choose the lowest priced product. This is a plausible, but a rather weak finding. The results, however, do not lend direct support to the argument that price is used as a cue of quality. In the experiments the subjects were asked to

---

[5] D.S. Tull, R.A. Boring, and M.H. Gonsior, "A Note on the Relationship of Price and Imputed Quality", Journal of Business, 37 (April 1964), pp. 186 - 191.

[6] Zarrell V. Lambert, "Product Perception: An Important Variable in Price Strategy", Journal of Marketing, 34 (October 1970), pp. 68 - 76.

[7] Armen A. Alchian and W.R. Allen, University Economics, (Belmont, Cal.: Wadsworth Publishing Company, 1965), Chapter 6.

choose a hypothetical product alternative on the basis of price alone, while they could not even have had any prior knowledge of the product. It appears that because price was the only concrete information available, the subjects naturally took it to be a cue of quality for the products they perceived to be different in quality.

The findings of the above studies suggested that consumers may prefer to purchase a product at differing prices, at least when they perceive brands of the product to be different, or when they are uncertain as to their ability to judge the product. Gabor and Granger conducted further research on this idea by introducing the concept of absolute price range.[6] Their range hypothesis states that a product is purchased only if its price falls into a range which the buyer considers acceptable. If the price is below the lower limit of the range, the product's quality is deemed suspect by the consumer; if above the upper limit the product is considered too expensive.

Gabor and Granger studied the the range hypothesis by means of a large-scale field inquiry for six products: nylon stockings, Wilton carpet, two (unspecified) household articles, and two (unspecified) food items. Each subject's range for a product was determined by asking her to respond to six different prices by saying either: "Yes, would buy at this

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[6] Andre Gabor and C.W.J. Granger, "Price as an Indicator of Quality: Report on an Enquiry", Economica, New Series, 33 No. 129 (February 1966), pp. 43 - 70.

price;" or "No, too expensive;" or "No, too cheap (to trust)." Log-normal distribution functions of of the lower and upper limits (=ends) of the range for each product were then fitted to the data with reasonable success. Further derivations from the distributions were also developed as aids for price setting.[9]

The close resemblance of Gabor's and Granger's work to Fechnerian scaling prompted Monroe and his colleagues to apply the Weber-Fechner law in their analyses of the role of price.[10] Analyses of the data of their experiments with several products showed that differential price limits do exist. Kamen and Toman, however, failed to find differential price limits for gasoline in a similar experiment.[11]

The existence of absolute price ranges could be taken as a convincing proof for the existence of segments of positive slopes in demand curves. The studies by Gabor and Granger, however, fall short of proving the existence of

---

[9] Gabor and Granger were able to derive the probability that a consumer will find a product, when priced at some price, belonging to his acceptable price range. This was accomplished by calculating 1 - the sum of the probabilities that a randomly chosen consumer will find the price too low or too high.

[10] Kent B. Monroe and M. Venkatesan, "The Concept of Price Limits and Psychophysical Measurement: A Laboratory Experiment", Proceedings of the 1969 Fall Conference, American Marketing Association (Cincinnati, Ohio, 1969), pp. 345 - 351; Kent B. Monroe, "Measuring Price Tresholds by Psychophysics and Latitudes of Acceptance", Journal of Marketing Research, 8 (November 1971), pp. 460 - 464.

[11] Joseph Kamen and Robert Toman, "Psychophysics of Prices", Journal of Marketing Research, 7 (February 1970), pp. 27 - 35.

such ranges. Their data appear to be strongly biased in favor of a price range because of the highly leading questions used in their research. The findings by Monroe and others concerning the existence of differential price limits should be taken with some reservations because of their misunderstanding of the Weber-Fechner law.[12]

Studies Which Employed Identical Product Samples

The early studies employed rather unrealistic experimental purchase situations where the subjects were not given actual product samples for inspection. Research that followed these studies used experimental situations in which the subjects had an opportunity to inspect identical product samples. The underlying hypothesis in this approach is that when the subjects are unable to discriminate the among product's of identical quality, they will seek cues for differentiating the products. The studies which used this approach analyzed the price-quality relationship experimentally with the following function:

---

[12] Weber's law is based on the observation that the size of a just noticeable difference in a stimulus, dS, depends on the magnitude of the stimulus S: $dS/S = k$, where k is a constant called the Weber ratio. Monroe et al. employed price as a stimulus. It is obvious that the Weber ratio is not constant over a range of prices. A just noticeable difference in price is one cent regardless of the level of the price. For further discussion, see Joseph Kamen and Robert Toman, "Psychophysics of Prices: A Reaffirmation", Journal of Marketing Research, 8 (May 1971), pp. 252 -257; or Jan Stapel, "'Fair' or 'Psychological' Pricing", Journal of Marketing Research, 9 (February 1972), pp. 109 - 110.

[2] PQnd = f (P, PI) , where

PQnd = Quality perceived in a product which is differentiable from other products.

P = Price.

PI = Product inspection.

Analyses of equation [2] were made by assuming a constant PI-effect across subjects and formulating [2] as a linear one-factor statistical model:

[2'] PQ = $\underline{PQ}$ + P + e, in which

$\underline{PQ}$ is the mean perceived quality, and e is the error term.

McConnell made extensive tests of the hypothesis that quality perceived in beer is a positive function of its price.[13] His study was conducted under the guise of a brewer's product test. The subjects, 60 graduate students and students' spouses were given the choice between three lettered bottles of the same beer at three different prices. The amounts of money corresponding to the price differentials between the most expensive and the two other beers

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[13] J. Douglas McConnell, "The Price-Quality Relationship in an Experimental Setting", Journal of Marketing Research, 5 (August 1968), pp. 300 - 303; ibid., "Effects of Pricing on Perception of Product Quality", Journal of Applied Psychology, 52 (August 1968), pp. 313 - 314; and , "An Experimental Examination of the Price-Quality Relationship", Journal of Business, 41 (October 1968), pp. 439 - 444.

were taped on the bottles of the cheaper beers. The subjects were visited three days a week for eight weeks and were allowed to "purchase" one bottle on each visit. At the end of the 24th trial, subjects were asked to select from a list of words commonly used to describe beer the three words that best described each brand. The subjects were also asked to evaluate the quality of each beer on a five point rating scale: Undrinkable :---------: Very pleasant.

McConnell's findings indicate that there is a significant positive relationship between price and the quality perceived in beer. He found that this relationship, however, was not linear. The lower and middle priced products were perceived as much closer in quality than the middle and higher priced ones.

McConnell's experimental design has been the basis for most subsequent research. His result of a positive price-quality relationship, nevertheless, has been criticized on the grounds that the experiment creates a rather unrealistic purchase situation in which the subjects have only one of the many possible indices of quality, viz. price.[14] His product samples were identical and prices were very prominently present in the experiment as the only differential information. As a result, the subjects used prices as a cue of quality.

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[14] Kent B. Monroe, "Buyers' Subjective Perceptions of Price", Journal of Marketing Research, 10 (February 1973), pp. 70 - 80.

Subsequent studies improved on McConnell's experimental design by including price information and some other information cue about quality (Q), such as brand name or store reputation in their purchase situations. These multicue studies use the formulation of equations [3] and [3']:

$$[3] \qquad PQ = f(P,Q,PI).$$

$$[3'] \qquad PQ = \underline{PQ} + P + Q + P \cdot Q + e.$$

Enis and Stafford studied the price-quality relationship for wall-to-wall carpeting. To assure varied expertise and prior knowledge of the product on the part of respondents they interviewed 178 home economics students, 135 housewives, and 55 professional carpet buyers and salesmen.[15] They analyzed five-point quality ratings of four identical patches of carpeting as a function of price and store information --- low image store vs. high image store. An analysis of variance and the means of the data showed that a highly significant positive price-quality relationship existed for the students and the housewives, and a significant ($p < 0.05$) relationship existed for the experts.

---

[15] Ben M. Enis and James E. stafford, "Consumers' Perception of Product Quality as a Function of Various Informational Inputs", Proceedings of the 1969 Fall Conference, American Marketing Association, (Cincinnati, Ohio, 1969), pp. 340 - 344; and, "The Price-Quality Relationship: An Extension", Journal of Marketing Research, 6 (November 1969), pp. 256 - 258.

While the store image did not affect the quality ratings of any of the three groups, the interactive effect of store and price did: $p < 0.01$ for students, $p < 0.05$ for housewives, and $p < 0.25$ for experts. In similar experiments Gardner analyzed prices and the presence or absence of brand names as possible cues of quality for three products: toothpaste, men's shirts, and men's suits.[16] Variance analyses of 360 students' quality ratings indicated that price was not used as an index of quality, while the presence or absence of brand names had a significant effect on the quality ratings.

Studies Which Employed Non-Identical Product Samples

Andrews and Valenzi studied the effect of price on the quality perceived in margarine and butter.[17] In the preliminary part of the study 31 female students rated the quality of three spreads that were priced at $0.95, $0.45, and $0.20 in a store. Analysis of this blind-test data showed that the subjects perceived the spreads to be slightly, but significantly different in quality in a way that was consistent with the actual prices. Next, each of

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[16] David M. Gardner, "An Experimental Investigation of the Price - Quality Relationship", Journal of Retailing, 46 (Fall 1970), pp. 24 - 41; and "Is There a Generalized Price - Quality Relationship?", Journal of Marketing Research, 8 (May 1971), pp. 241 - 243.

[17] I. Robert Andrews and Enzo Valenzi, "The Relationship Between Price and Blind-Rated Quality for Margarines and Butter", Journal of Marketing Research, 7 (August 1970), pp. 393 - 395; E.R. Valenzi and I.R. Andrews, "Effect of Price Information on Product Quality Ratings", Journal of Applied Psychology, 55 (February 1971), pp. 87 - 91.

the three spreads was paired with three different prices, and each of the nine combinations was rated twice by 46 student subjects. The subjects' nine-point quality ratings were analyzed with the following linear model:

[4] $PQd = \underline{PQd} + P + PR + P \bullet PR + e$, where

PQd = Quality perceived in a product that is differentiable from other products.

PR = The effect of product on perceived quality.

The results showed taste quality ratings to be positively related to both price information, and actual product differences. The actual product differences, however small in the preliminary blind-test, were found to account for approximately three times as much variance as the price information.

Shapiro analyzed the price-quality relationship by presenting two differentially priced, lettered samples of carpeting, chairs, colognes, stockings, and sweaters to some 300 women, and reversed the prices for another 300 women.[18] An analysis of mean quality ratings showed that price indeed was used as an indicator of quality. Price reliance varied over products, but was more significant in situations of high perceived risk in a product, low self-confidence to

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[18] Benson P. Shapiro, "Price as a Communicator of Quality: An Experiment", (Unpublished Doctoral Dissertation, Harvard University, 1970).

judge a product, and absence of other information cues.

Rao presented 72 male students with electric shavers and razor blades, which had brand names on them so that the subjects could clearly differentiate the products.[19] Judging from an analysis of variance of the dimension weights of a INDSCAL solution of his data, Rao concluded that price did not affect perceived quality while the presence vs. absence of Consumer Reports information did.

Studies Which Employed Both Identical and Non-Identical Product Samples

Jacoby and others conducted an experiment where both identical and non-identical product samples were used.[20] Their objective was to investigate whether the presence or absence of prices and brand names affects perceived quality differently in the purchase situation where the products are physically identical, as compared with the situation where the products are different. Each subjects tasted and rated the quality of three samples of the same beer --- identical condition --- or three samples of different beers --- non-identical condition. The authors claim that the subjects

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[19] Vithala R. Rao, "The Salience of Price in the Perception and Evaluation of Product Quality", (Unpublished Doctoral Dissertation, University of Pennsylvania, 1970).

[20] Jacob Jacoby, Jerry C. Olson, and Rafael A. Haddock, "Price, Brand Name, and Product Composition Characteristics as Determinants of Perceived Quality", Journal of Applied Psychology, 55 (December 1971), pp. 570-579.

did differentiate the samples of different beers on the basis of taste alone, and proceed to discuss how consumers form their quality judgments in the two situations. The published data, however, strongly suggest that in the absence of other cues the subjects were unable to differentiate among the different beers.[21] Therefore, the finding by Jacoby and his colleagues that the presence of price does not affect perceived quality, while the presence of brand names does, may apply only to a purchase situation where the products are not differentiable.

Critique and Summary of Past Research

The results of the studies presented above differ in their conclusions. In the studies where price was the only information cue, a price-quality relationship was always implied. When other cues were introduced, however, the relationship was not always found. In some circumstances a strong relationship seemed to exist; in others, the relationship was replaced by a brand - quality, or a Consumer Reports information - quality relationship. Some of the multicue studies used almost identical experimental designs, yet yielded contradicting results.

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[21] Jacoby et al., ibid., used a quality rating scale of 1 - 100. Their Table 1, p.573, shows that in absence of any information the identical beer samples were rated more different then the samples of purportedly different beers. The range of means of identical beers was 17.1, while that of the different beers was 16.5. The ranges of the standard deviations were about equal.

It must be concluded that the results cast serious doubt on the possibility of a generalized price-quality relationship. Consequently, it appears that understanding the relationship between price and perceived quality involves a more detailed and complex framework than presented in the empirical work to date. For example, each of the studies analyzes only one purchase situation, in which the product samples are either identical or different. None of the studies tests whether an increased physical difference in choice alternatives affects the role of price, brand name, etc., in formulating quality evaluations.

Second, it was discussed above that a price-quality relationship can exist only in the case of uncertainty. Many of the previous studies may muddle their analyses of the relationship by using experimental situations where the subjects face different levels of uncertainty in their judgment task. For example, some subjects in the study by Jacoby and others judge quality in beer on the basis of taste alone, while other subjects have price and brand name information for their judgments.[22]

Third, some studies analyzed perceived risk -- tied to the product -- as a variable mediating the strength of the price-quality relationship. These studies rest their foundations on research findings which suggest that the level of

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[22] Ibid., p.571.

perceived risk has an effect on consumer's information processing.[23] The idea behind this research is that the consumer is much more afraid of some products being of poor quality, than of some other products turning out to be lemons. The problem of measuring the level of risk perceived in a product, though, has proven to be very difficult. This may have, in part, caused the rather inconsequential results of the recent research concerning the effects of perceived risk on price reliance in quality judgments.

Finally, none of the previous studies has controlled the contents of price cues and other information cues with respect to each other and with respect to the opinion that the subjects have formed by inspecting product samples. This is a sizable simplification of real judgment situations, in which the cues may conform to, or conflict with each other, and with the opinion of the product that the consumer already has. Again, this non-control of an important facet of the judgment task may be a partial cause of the conflicting empirical results.

It seems fair to say that the research revieved above has offered at most a partial view of the effect of various information cues on quality judgments, owing to the limited and hypothetical experimental purchase situations in which

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[23] Donald F. Cox (ed.), Risk Taking and Information Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967).

these studies were made. There is clearly a need to analyze the price-quality relationship in a more extensive and naturalistic setting in order to find out the conditions under which a significant relationship exists. Such a study could have significant implications if its findings were of use in determining managerial pricing policies.

CHAPTER III

SALIENCE OF PRICE IN PERCEPTION OF QUALITY

The substantive problem of the price-quality relationship was introduced in the previous chapter together with a review of past research on the relationship. This chapter establishes the theoretical basis for empirical analyses of the relationship. A discussion of what is meant by quality is first presented. An information processing model is next outlined to clarify the cognitive process through which prices and other information are converted into quality judgments. The thrust of the chapter is in two areas: (1) the analysis of factors that affect the role of price in the perception of quality; and (2) the formulation of several hypotheses concerning these factors.

What is Quality?

Regardless of the proliferation of different types of quality related research there has been little discussion of what is meant by quality and how it should be measured. Consumer economists seem to operate on a concept that could be called objective quality, which refers to the excellence of a product's engineering specifications.[24] This concept is clearly not applicable to the purposes of the present research.

Scholars in marketing and psychology seem to apply concepts of perceived quality which are, at least in part, subjective. Quality could, thus, be taken to mean a person's preference toward a product in absence of its price. Quality could also mean a combination of product attributes which affects the consumer's preference toward a product as one important attribute. The first of these concepts is easily measured and understood. For some products, however, such as automobiles this concept is too general. Attributes like styling and color influence s person's preference toward a car but do not belong to the composite measure of quality. The second concept avoids this problem but defies accurate definition and measurement. It appears, nevertheless, that both concepts are suitable for the purposes of the present study. The effects of

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[24] Consumer Reports, for example, bases its quality ratings on exact engineering tests and judgments by experts.

attributes that are not related to quality as specified in the second concept are minimized in this experiment.

A Model of Quality Perception

The model of quality perception is intended to describe the cognitive process which converts information about a product into a subjective quality judgment. The purpose of the model is to identify factors which are relevant to the cognitive process of quality perception,

The consumer forms his quality judgment on the basis of information that he has about products. In most judgment situations there are three distinct types of sources, from which the consumer may receive product related information. These are: 1. explicit information sources, 2. product inspection, and 3. prior knowledge. The first group represents the sources whose information is explicit at the time of the decision. In purchase situations prices, salesmen's opinions, etc., belong to this group. The second type is the information that the consumer acquires by inspecting available products. The first two groups together represent all available external information. The third type, prior knowledge, is not external but represents all the product information that the consumer has collected in the past and stored in his mind. These three types of information are the input from which quality perceptions are molded.

Figure 3 outlines the cognitive process in which the various types of information are converted into a quality judgment.

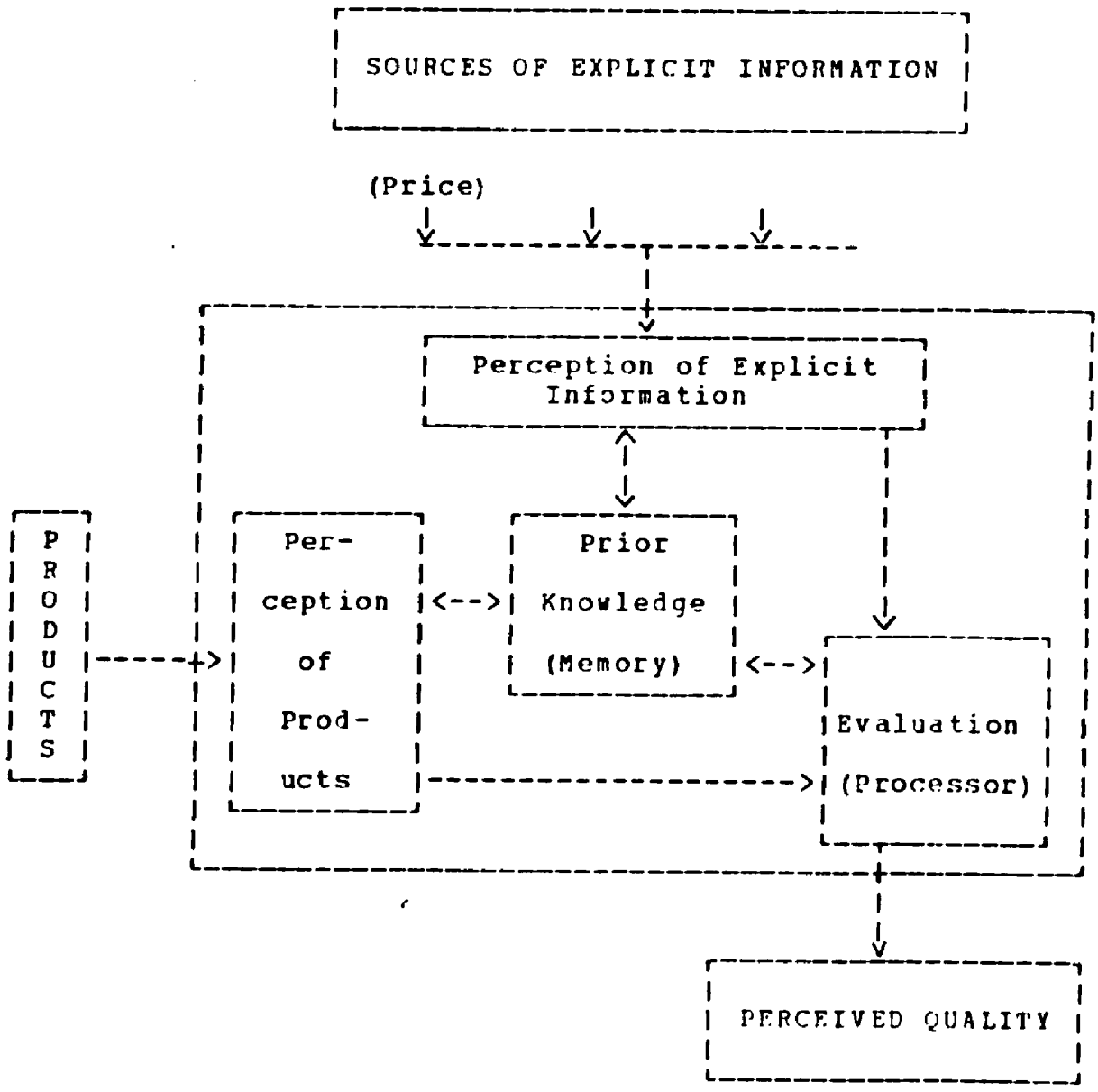


Figure 3.

A Model of the Cognitive Process of Quality Perception

The model of Figure 3 has its origins in the information processing model presented by Newell and Simon.[25] They suggest that all external information that enters the cognitive process is first encoded. That is, the consumer has perceptual functions which screen and interpret the information from the external sources. These functions are governed by memory, which in the case of quality judgment consists of acquired rules about how to select and interpret explicit information. The encoded information is then submitted, together with the prior product knowledge to an evaluative processing from which a quality judgment emerges.

Two points concerning the role of the above model with regard to empirical research on the price-quality relationship should be noted. First, the objective of the research is not to analyze and verify the elements of the model separately; rather, research is directed toward varying the input information, especially price information and observing the effect on perceived quality. This means that one type of product information, namely prior knowledge cannot be directly manipulated in an experiment. Second, the model is only a hypothesis about how information is processed into a quality judgment. Its purpose is only to provide a structured framework of the relevant cognitive functions which may affect perceived quality. Theoretical analyses of

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[25] Allen Newell and Herbert A. Simon, Human Problem Solving, (Englewood Cliffs, N.J., Prentice - Hall Inc., 1972), pp. 20 - 21.

quality perception presented in the next two sections rest on the framework of the model.

Factors That Affect the Role of Price in Perception of Quality

The review of past studies showed that the research results concerning the relationship between price and perceived quality contradict one another. It was suggested that the relationship may be more complex than was considered in the previous studies. The conflicting results could have been caused by factors that were not included or controlled in the experiments. This section presents a discussion of factors that are seen, a priori, to influence the degree of price reliance in quality judgments. The first objective of the section is to show how some of the contradicting results of the earlier studies can be made compatible by accounting for the effects of certain factors that were not included in the experiments. The second objective is to formulate the effects of these factors into hypotheses for empirical testing.

Amount of Information

The model of the cognitive process of quality perception shows that three types of information form the input from which quality assessments are made. The total amount of information of these three types may mediate the effect of price on perceived quality. For example, if the

consumer has limited prior knowledge about the product and is not an expert in assessing its quality he is making a judgment under conditions of considerable uncertainty. He will try to reduce the uncertainty by accepting more information for his judgment. In the experimental situation this means that price information may be used more as a cue of quality. Consequently, it is hypothetized that the less information, the more likely it is that price will be used as a cue of quality.

This hypothesis is strongly supported by a multitude of empirical studies. Several such show that the amount of information which is given to a subject influences the amount of additional information that he will utilize in his judgment task. Green and Lanzetta report that subjects who were presented with little information for their decisions tended to purchase more information to reduce perceived uncertainty.[26] Similarly, Irwin and Smith, and Morlock found that increased uncertainty leads to increased information seeking (and utilization).[27]

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[26] Paul E. Green, "Consumer Use of Information", in Joseph W. Newman (ed.), On Knowing the Consumer, (New York, John Wiley and Sons, Inc., 1966), pp. 67 - 80. ; John T. Lanzetta, "Information Acquisition in Decision Making", in A.J. Harvey (ed.), Motivation and Social Interaction, (New York, Ronald Press, 1963).

[27] F.W. Irwin and W.A.S. Smith, "Value, Cost, and Information as Determiners of Decision", Journal of Experimental Psychology, 54 (September 1957), pp. 229 - 232. H. Morlock, "The Effect of Outcome Desirability on Information Required for Decision", Behavioral Science, 12 (July 1967), pp.296 - 300.

The findings of the past studies on price-quality relationship also seem to support this propositon for two of the three types of information of the model above. Enis and Stafford's results indicate that the more prior product knowledge a person has, the less prone he is to use explicit information messages as cues of quality.[28] The studies by Gardner and Jacoby et al. may give some support to the hypothesis that a small amount of explicit information leads to increased price reliance. Half of the subjects of their studies received price and brand information while the other half were not shown brand names. Prices had a significant effect only upon the quality ratings of the subjects who did not receive brand information.[29]

Many of the conflicting findings of the previous studies can be made compatible by assuming that the varying amounts of prior product knowledge and explicit information influenced the results. All of the single cue studies found price to affect quality judgments. This finding is particularly strong in the studies which did not present actual product samples to the subjects. On the other hand, the studies which showed their subjects actual product samples, and gave the subjects more explicit product information, present a weak or no relationship between price and

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[28] Enis and Stafford, "Consumer's ....

[29] Gardner, "Is There ....., p. 242; Jacoby et al., "Price, Brand Name, ..., p. 574.

perceived quality.

In summary, there is rather convincing empirical evidence to support the hypothesis that scant prior product knowledge and a small amount of explicit product information cause increased reliance on price information. From the viewpoint of a producer these hypotheses are not interesting. The producer cannot take actions to decrease the amount of prior knowledge; neither can he much vary the amount of the explicit information that a consumer has. He can easily take actions, however, to change product inspection information, for example, by product development, or by changing the set of available product alternatives. No research, nevertheless, has been made to study the effect of the amount of product inspection information on price reliance.

The current research studies the hypothesis that the less product inspection information the consumer has, the more prone he is to use price as a cue of quality. The hypothesis is investigated by varying the amount of product inspection information in two ways. First, the price-quality relationship will be analyzed for two products. The quality of one of them is easy to assess. The subjects will have concrete information of this product's quality just by inspecting it. The other product is difficult to evaluate, so that the subjects are faced with uncertainty about its quality as they have only scant prior knowledge about it. Second, the effect of price information on perceived quality

is analyzed for two sets of product samples. The first set is composed of three nondifferentiable product samples, and the other of three different product samples. The hypothesis is that the similar products cause more price reliance, because the subjects cannot differentiate the samples by inspection.[30]

Conflicting Information

Product related information that enters the cognitive process may affect perceived quality not only by its amount but also by its content. The information cues coming from the various sources may carry conflicting messages about product quality. The more conflicting these messages are, the more cognitive conflict will the consumer experience. A possible hypothesis is that he will try to resolve the conflict by using prices as indices of quality. Figure 4 diagrams this proposition together with the hypothesis about the effect of the amount of information on price reliance.

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[30] The prior studies have shown that the subjects try to differentiate products that are identical. It is probable that this phenomenon is not confined to experimental judgment situations.

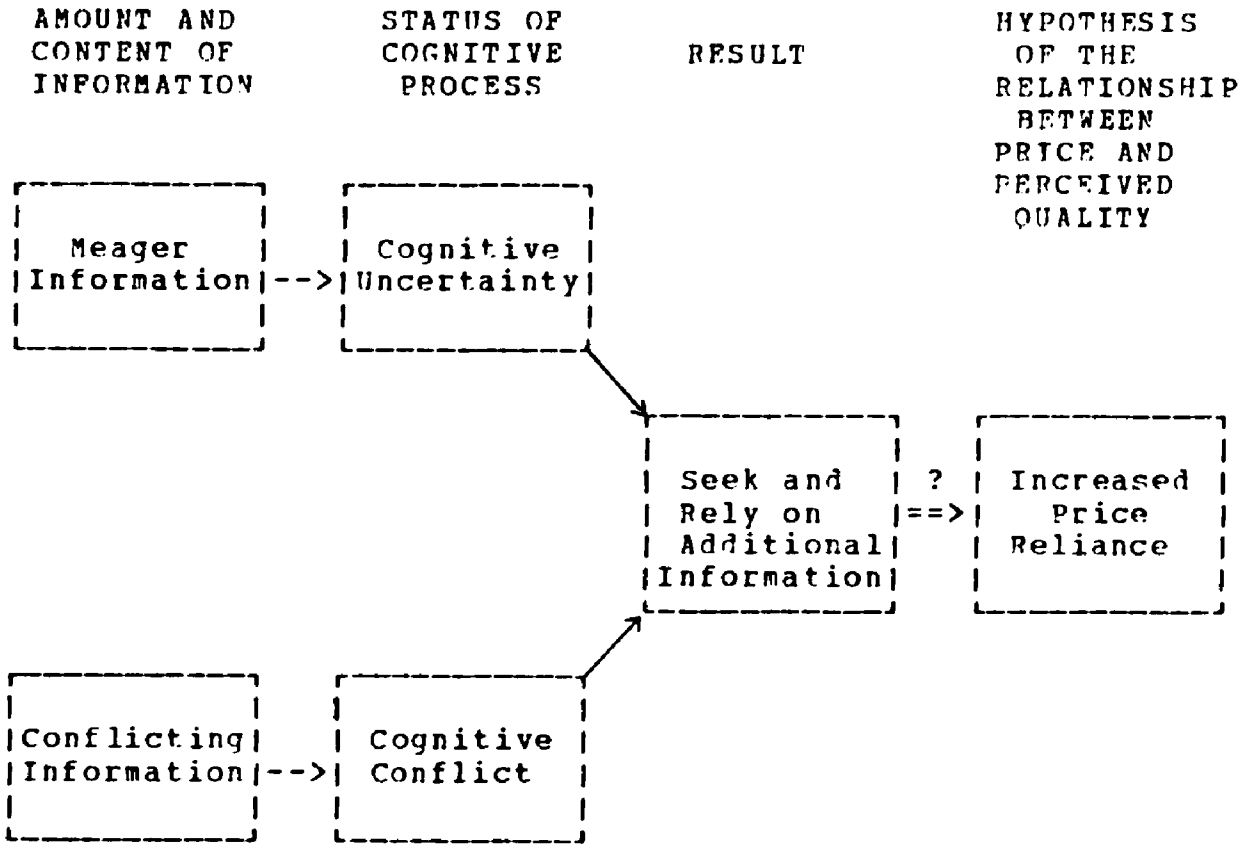


Figure 4.

The Hypotheses of the Effect of Amount and Content of Information on Price Reliance

The hypothesis about the effect of cognitive conflict on price reliance is supported, on a general level, by studies which report that cognitive conflict is conducive to increased information seeking and utilization.[31] These studies, however, are only a drop in the sea of writings that analyze various aspects of the individual's behavior as a function of the amount of cognitive conflict. The only aspect that these writings agree on, is that cognitive conflict is such an unpleasant state of affairs that one tries to avoid it. [32] But there seem to be many widely different opinions and explanations of how one goes about reducing or avoiding cognitive conflicts. One might do one of the following: (1) seek additional information to resolve the problematic issue, (2) perceive available information differently, (3) distort some messages, or discredit information sources, and, finally, (4) select and utilize

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[31] For example, Joan E. Sieber and John T. Lanzetta, "Conflict and Conceptual Structure as Determinants of Decision - Making Behavior", Journal of Experimental Psychology, 32 (December 1964), pp. 623 - 641.

[32] Janis, for example, states: "This state of tension which occurs whenever there is a decisional conflict .... will motivate the person to work out some form of resolution ...., Irving L. Janis, "Motivational Factors in the Resolution of Decisional Conflict", in Marshall R. Jones (ed.), Nebraska Symposium on Motivation, Vol. VII, (Lincoln, Nebraska: Nebraska University Press, 1959), pp. 198-231; and similarly Festinger writes: "Indeed this predecision period can be and has been considered to be synonymous with a period of frustration", Leon Festinger (ed.), Conflict, Decision and Dissonance, (Stanford, Cal.: Stanford University Press, 1964), p.3.

messages on the basis of their contents.[33] The last of these alternative behaviors, that of selective exposure to information, fits well the typical situation where the consumer judges product quality. By the time he receives price information, the consumer already has some perception of the quality of available products. These judgments, attitudes toward each product, are based on prior knowledge and product inspection. Prices and other explicit information then convey messages that either agree, or conflict with the attitudes. The critical question to be analyzed for the research on price-quality relationship is: will the consumer's perceptual functions treat conflicting and non-conflicting information differentially, or will he select explicit information on the basis of its contents?

The principle of selective exposure is one of the most widely researched topics in social psychology and mass communications. Several theories have been forwarded for predicting the individual's selection and utilization of in-

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[33] A lucid exposition of alternative behaviors is presented by N.T. Feather, "A Structural Balance Approach to the Analysis of Communication Effects", in Leonard Berkowitz (ed.), Advances in Experimental Social Psychology, Vol. 3 (New York: Academic Press, 1967).

formation as a function of his current opinion.[34] These theories have one thing in common. They suggest that selective exposure is caused by the individual's avoidance of cognitive conflict. For example, the basic tenet of Festinger's theory of cognitive dissonance is that a person wants to achieve consistency in his cognitive world by exposing himself to information only if it confirms, i.e. is consonant with his current attitude, and by avoiding dissonant information.[35] Sherif and her colleagues have found regions of information acceptance, rejection and indifference, which all are defined by the current attitude.[36]

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[34] Models of information selection have been presented among others by Leon Festinger, A Theory of Cognitive Dissonance, (Evanston, Ill.: Row, Peterson and Company, 1957); C.W. Sherif, M. Sherif, and R.E. Nebergall, Attitude and Attitude Change: The Social Judgment - Involved Approach, (Philadelphia: Saunders, 1965); Robert B. Zajonc, "Cognitive Theories of Social Behavior", in G. Lindzey and E. Aronson (eds.), Handbook of Social Psychology, Vol.I , (New York: Addison - Wesley, 1967), pp. 320-411; and N.T. Feather, "An Expectancy Value Model of Information Seeking Behavior", Psychological Review, 74 (September 1967), pp. 342 - 360.

Models by Festinger and Sherif et al. have been tested empirically several times, the former even in various marketing contexts; see e.g. Robert J. Holloway, "An Experiment on Consumer Dissonance", Journal of Marketing Research, 31 (January 1967), pp. 39 - 43; and Robby J. Calder, "Cognitive Consistency and Consumer Behavior", in H.H. Kassarjian and T.S. Robertson (eds.), Perspectives in Consumer Behavior, Revised Edition, (Glenview, Ill.: Scott, Foresman and Company, 1973), pp. 247 - 263.

[35] Leon Festinger, A Theory of ....

[36] C.W. Sherif et al., Attitude and ....

The theories of selective exposure would predict that price information, which is sufficiently dissonant with the consumer's present perception of product quality will be screened out, and will thus have no effect on his quality judgment. At present there is no reason to claim that this prediction should be or should not be accepted.[37] None of the previous price-quality studies have controlled the relationship between price cues and the information from product inspection and prior knowledge.

This study will apply the principle of selective exposure in the analysis of price-quality relationship. An advantage of this approach over that of the previous studies is that it is more realistic. In most judgment situations the consumer receives both consonant and dissonant explicit information, as will the subjects in this experiment. This makes it possible to investigate if the consumer's perceptual functions screen out, accent, or modify price information which does not agree with his perception of quality.

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[37] Empirical findings presented in Leon Festinger, Conflict, Decision and Dissonance, (Stanford, Cal.: Stanford University Press, 1964), pp. 65-95 suggest that selective exposure is not used to reduce pre-decision cognitive conflict but only post-decision dissonance. A group of empirical studies, which show evidence of selective exposure in both pre- and post-decision situations are reviewed in James O. Whittaker, "Resolution of the Communication Discrepancy Issue in Attitude Change", in C.W. Sherif and M. Sherif (eds.), Attitude, Ego - Involvement and Change, (New York: Wiley Inc., 1967), pp. 159 - 177.

Each subject will be presented with price information that is either consonant or dissonant with her opinion of the quality of three product samples. The hypothesis is that dissonant price information has less effect on perceived quality than consonant price information, or dissonant price information has no effect at all.

Prices Vs. Other Explicit Information

So far the discussion has been centered on the existence of a price-quality relationship in various situations. An alternative question is: How strong is price as a source of information relative to other sources?

Enis and Stafford's results indicate that only a high level of prior product knowledge will cancel the effect of prices on perceived quality.[38] No research has been directly addressed to the question of salience of price as a cue of quality relative to other sources of explicit information. Several studies show that an existing price-quality relationship is negated by giving the subjects more explicit information.[39] This, however, does not say too much about the relative efficacy of prices and other explicit information on perceived quality.

It is hypothesized in this study that the Consumer Reports rating information has more effect on perceived qua-

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[38] Enis and Stafford, "Consumer's ....

[39] Gardner, ibid.; Jacoby et al., ibid.; Pao, ibid.; and Shapiro, ibid.

lity than price information. Each subject is given either consonant or dissonant prices and Consumer Reports ratings. The relative effect of these cues on her quality ratings are analyzed.

Perceived Risk

One of the hypotheses above was based on the observation that when the consumer is uncertain of the quality of alternative products, he will rely on prices as cues of quality. He also can be uncertain as to how well a product's quality will fit the purpose for which it will be used. In some uses a very high quality is required and, consequently, the consumer perceives that his quality judgment is risky. In other situations a product with lesser quality will do, and the risk inherent in the judgment is small. Perceived risk is usually defined as the expected value of the negative consequences that a purchase may create.[40] It has been shown to increase the amount of information that the consumer requires for his decision, and also to affect his processing of available information.[41] The effects of perceived risk on the price-quality relationship have been studied most extensively by Shapiro. He,

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[40] Scott M. Cunningham, "The Major Dimensions of Perceived Risk", in Donald F. Cox (ed.), Risk Taking and Infomation Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967), p.83.

[41] For various research results, see Cox (ed.), ibid.

like the others, tried to establish that each product has an inherent amount of perceived risk associated with it. To gauge the amount, complicated measurement schemes were introduced. Shapiro, for example, collected a set of risk ratings from his subjects, and combined them with a weighting system that "was approved by a panel of experts in consumer behavior".[42] It may be because of these cumbersome measurements that only small correlations have been found between the level of perceived risk and the amount of price reliance.

The definition of perceived risk is applied differently in this study and is tied to the purpose for which the consumer is judging the product. This approach avoids the necessity of constructing complex and somewhat abitrary indices; rather, the subjects are instructed to role play situations, which vary in their degree of risk. The hypothesis to be studied is that a high level of perceived risk causes an increased amount of price reliance. The effect of consonant and dissonant information on quality ratings is analyzed for varying levels of perceived risk.

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[42] Benson P. Shapiro, "Price Reliance: Existence and Sources", Journal of Marketing Research, 10 (August 1973), pp. 286 -294.

Summary of Hypotheses

The following five propositions are the basic hypotheses of this study.

Hypothesis 1.

There is a positive relationship between price and perceived product quality. This relationship is weaker than that between Consumer Reports rating information and perceived quality. (See pp. 42-43.)

Hypothesis 2.

The price-quality relationship is stronger in situations where the available product alternatives are perceived to be similar than where they are perceived to be different. (Pp. 35-36.)

Hypothesis 3.

Price is used more as a cue of quality of products that are difficult to evaluate than of products that are easy to evaluate. (Pp. 35-36.)

Hypothesis 4.

A high level of perceived risk is conducive to reliance on price as a cue of quality. (Pp. 43-44.)

Hypothesis 5.

Consonant price information affects quality perceptions more than dissonant price information. (Pp. 41-42.)

CHAPTER IV

RESEARCH METHOD

Overview

The conceptual model of quality perception and the several hypotheses presented in Chapter III formed the basis of the study designed to determine empirically the salience of price in perception and in evaluation of quality. The design of the empirical study is presented in this chapter.

The experimental design of the study involved a 2 • 2 • 2 • 2 • 2 random factorial design. Data were collected for three product samples with this design. 128 housewives were first presented with three samples of bath towels, and (later) wall-to-wall carpeting in a simulated purchase and consumption setting. The two products were the first treatment. The degree of similarity between the samples, and the level of risk in the purchase situation were the next two treatments. Mock-up prices and Consumer Reports quality ratings of the three samples were then presented to the subjects. These two treatments were arranged to either

correspond to or conflict with the subject's pre-treatment ranking of the samples. Quality ratings as well as ratings of the subject's confidence in her quality judgment were then collected. These data were used to analyze the role of price in the process of quality perception.

Research Approach

An experimental technique, employing a simulated purchase situation was selected as the method best meeting the requirements of this study.

A controlled experiment provides for the isolation of the effects of variables to be measured, a goal which is more difficult to attain in a field study. This study intends to determine whether price plays a role in consumers' quality perception and, specifically, conditions under which price plays an effective role. For this reason unrelated variables were to be isolated, or controlled to the greatest possible extent, and a laboratory experiment was utilized in the study. Product samples, hypothetical purchase situations, prices, and Consumer Reports quality ratings could be freely arranged in the experiment to realize the objectives of the study.

The experimental settings used in the study were created to approximate real purchase situations. The subjects inspected product samples and had explicit product information, viz. prices and Consumer Reports quality

ratings, just as the consumer inspects available brands and has prices and other information such as salesman's opinions. This approach was taken to insure that the participants of the experiment were not subjected to tasks with which they were completely unfamiliar.[43] It was hoped that data collected in this way were less artificial and the results would be applicable to marketing decision making.

Price and the salesman's opinions were originally planned as sources of explicit information. It became apparent, however, that the presence of a "salesman" in the experimental situation would both disturb the subjects' deliberation and possibly cause biases in their responses. The direction of the bias is unknown, and could not be measured. Consumer Reports (C.R.) quality ratings, therefore, were selected as the other source of explicit information. The artificiality created by the presence of the C.R. ratings in a purchase situation could not be avoided. The analysis presented in Chapter III, and the results of the previous studies showed that at least two sources of explicit information must be included to gain meaningful results about the relationship between price and perceived quality.

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[43] Andrews and Valenzi, ibid., and Jacoby et al., ibid., used experiments where the subjects tasted buttered sandwiches and samples of beer, respectively, marked at different prices. Conceivably a person faces a judgment task of this sort only in an experimental situation. This practice, together with the use of student subjects creates such an artificial experimental environment that the results may be less applicable in managerial marketing problems.

Selection of Products

It was hypothesized in Chapter III that limited experience in judging a product's quality is conducive to price reliance. This hypothesis was tested by selecting two products. Informal discussions were first made with several housewives about their methods in evaluating the quality of various products. These sessions indicated that the quality of bath towels was considered relatively easy to assess by judging the towel by its thickness. Further pilot tests showed that 20 out of 21 subjects evaluated the towel samples consistently (see Appendix A). Consequently, bath towels of varying thickness, but of the same color and shade, size, and of approximately the same raw material and type of weaving were selected for the study. Bath towels were selected to represent a product the quality of which the subjects can easily form an opinion by simple inspection.

Discussions with housewives concerning wall-to-wall carpeting revealed that the quality of such products was considered difficult to judge. Type of weaving and carpet construction, density and pulling strength of the material, overall feel, and the material itself were among the proposed attributes that were seen to affect carpets' quality. A pilot test was made with fifteen patches of carpeting that were of the same color but different shade and were made of different materials with different weaving and construction techniques. Remarkable variations in the

evaluations of the carpets by 18 women were found (see Appendix A). Carpeting was selected to represent a product, therefore, whose quality is determined by several attributes which the subjects were not well equipped to judge.

Purchase Situation Treatments

Two purchase situation treatments were used to investigate the hypotheses about the effects of the degree of similarity between product alternatives and the level of purchase risk on price reliance. Four experimental purchase situations were created for each of the two products by controlling two treatments on two levels. The first treatment, A, varied the degree of similarity between product samples. The second treatment, R, varied the level of perceived risk in the purchase situation.

Treatment A

Condition A1 presented the subjects with two identical product samples and a third, which was nearly identical with the first two. In condition A2 the subjects inspected samples which were considerably different in their physical attributes. The selection of the similar and different product samples was made with a series of pilot tests, which are described in Appendix A. Twenty-one subjects of a pilot test could not differentiate the quality of the three similar towels by inspection; twenty of them ranked the quality of the different towels in the predicted order. The pilot

tests for carpets suggested that people are not consistent judges of quality of carpets. This is in keeping with the purpose to select a product whose quality is difficult to judge. The pilot tests, nevertheless, gave enough information to identify two sets of carpet samples to represent the similar and the different conditions.

The product samples used were such that the consumer would judge their quality in real purchase situations. Bath towel samples were all purchased in local stores. Samples of carpeting were standard showcase patches of discontinued carpet lines. All patches were in prime condition despite their use in the store where they were purchased. The brand names of the samples are shown in Appendix A.

The purpose of treatment A was to simulate shopping situations in which the degree of similarity of available product alternatives varies. In order to see if this affected subjects' quality ratings, half of the subjects were set in a judgment situation where their prior knowledge and product inspection did not help them to differentiate among the products (condition A1, similar samples). The other half faced a situation in which they were able to differentiate among the products quite easily (condition A2, different samples).

Treatment R

It was hypothetized in Chapter III that a high level of perceived risk will make the consumer more prone to use price as a cue of product quality. The second situational factor, R, was designed to test this hypothesis.

Perceived risk has been measured most often by elaborate constructs of indices and weighting systems.[44] An alternative method for varying the degree of perceived risk was utilized in this study by letting the subjects role play hypothetical purchase situations in which different levels of risk were present. The purchase situations described purposes for which the product was to be purchased. A series of preliminary tests and pilot tests were made to find out low risk and high risk situations for the two products. The pilot tests are presented and discussed in Appendix B.

Half of the subjects were to role play a situation of low perceived risk, R1; and the other half a situation of high perceived risk, R2. The created situations are summarized in Figure 5.

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[44] Measurements of perceived risk are usually based on the following quantification:

$$\text{Perceived Risk} = \sum_{C} \left[\text{Subjective probability of the occurrence of consequence C.} \right] \cdot \left[\text{Amount of disutility of consequence C.} \right]$$

See , e.g., Shapiro, "Price as a ....."

	TYPE OF PURCHASE SITUATION	
PRODUCT	Low Perceived Risk (R1)	High Perceived Risk (R2)
Towel	Purchased for FAMILY	Purchased for WEDDING PRESENT
Carpeting	Purchased for CHILDREN'S BEDROOM	Purchased for STAIRS AND ENTRYWAY

Figure 5.

The Purchase Situations That Were Used to Create Conditions of Low and High Perceived Risk

The created situations for towels and carpeting are comparable to what is called perceived psychosocial risk and perceived performance risk by the risk theorists.[45] The subjects of the preliminary tests indicated that the social aspects make a wedding gift purchase much more important than a purchase for family. A pilot test also showed that the durability required of a carpet that is placed on stairs and the adjoining entryway makes the purchase more risky than when the carpet is purchased for a child's bedroom.

In summary, the purpose of the two situational factors A and R was to experimentally simulate various purchase situations. These situations were created to analyze the hypotheses that the degree of similarity between available products, and the level of purchase risk mediate the consumer's price reliance. Approximations of purchase situations were used to avoid laboratory situations which have no counterparts in real life. The four experimental purchase situations are represented in Figure 6, which restates the practical objective of the study.

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[45] Donald F. Cox (ed.), Risk Taking and Information Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967), pp. 7 - 8.

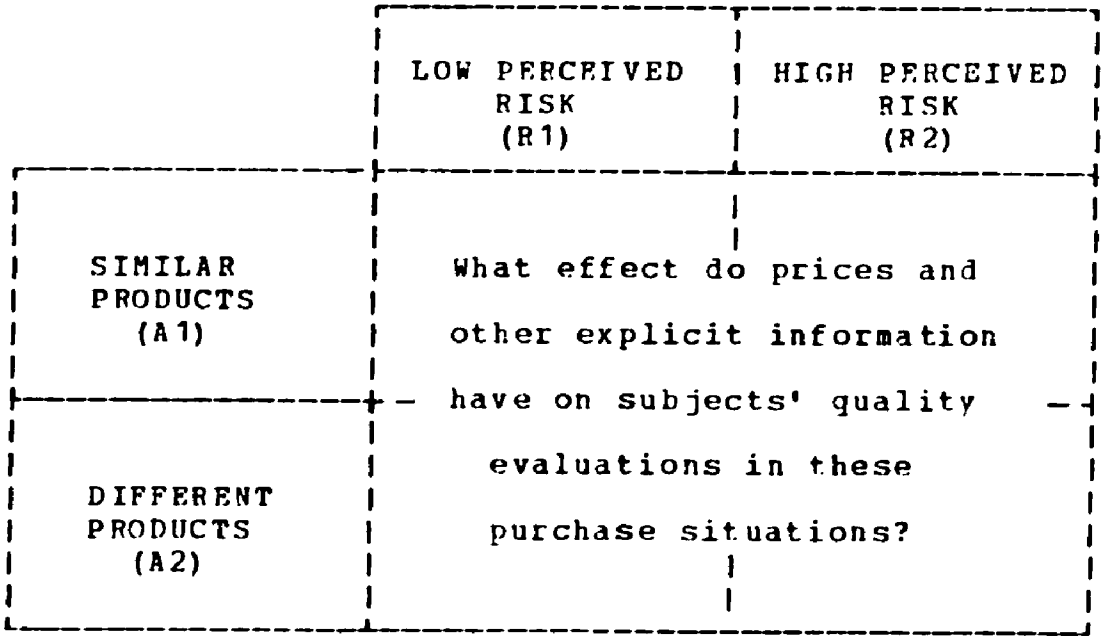


Figure 6.

The Four Experimental Purchase Situations Created by the Factors A and R

Experimental Procedure and the Information Factors

Figure 7 represents the flow of the experimental procedure.

The subjects were interviewed one at a time. Before the subject entered the interviewing room she had been placed randomly in one of the purchase situations described in the previous section. This involved first the selection of appropriate product samples; either three similar, or three different samples. Second, a questionnaire was selected which described the purpose for which the subject was to purchase the product for; either a low risk or a high risk purpose. These arrangements took care of the purchase situation treatments A and B.

When the subject entered the room, she was given the questionnaire to read. It was ascertained that she understood the tasks expected of her. She was then given the three samples for her inspection. Having inspected the samples the subject ranked their quality. This ranking was taken as the indicator of the relative subjective quality of the three samples. The subject determined this on the basis of prior product knowledge and product inspection, i.e., the opinion about the products in absence of explicit information.

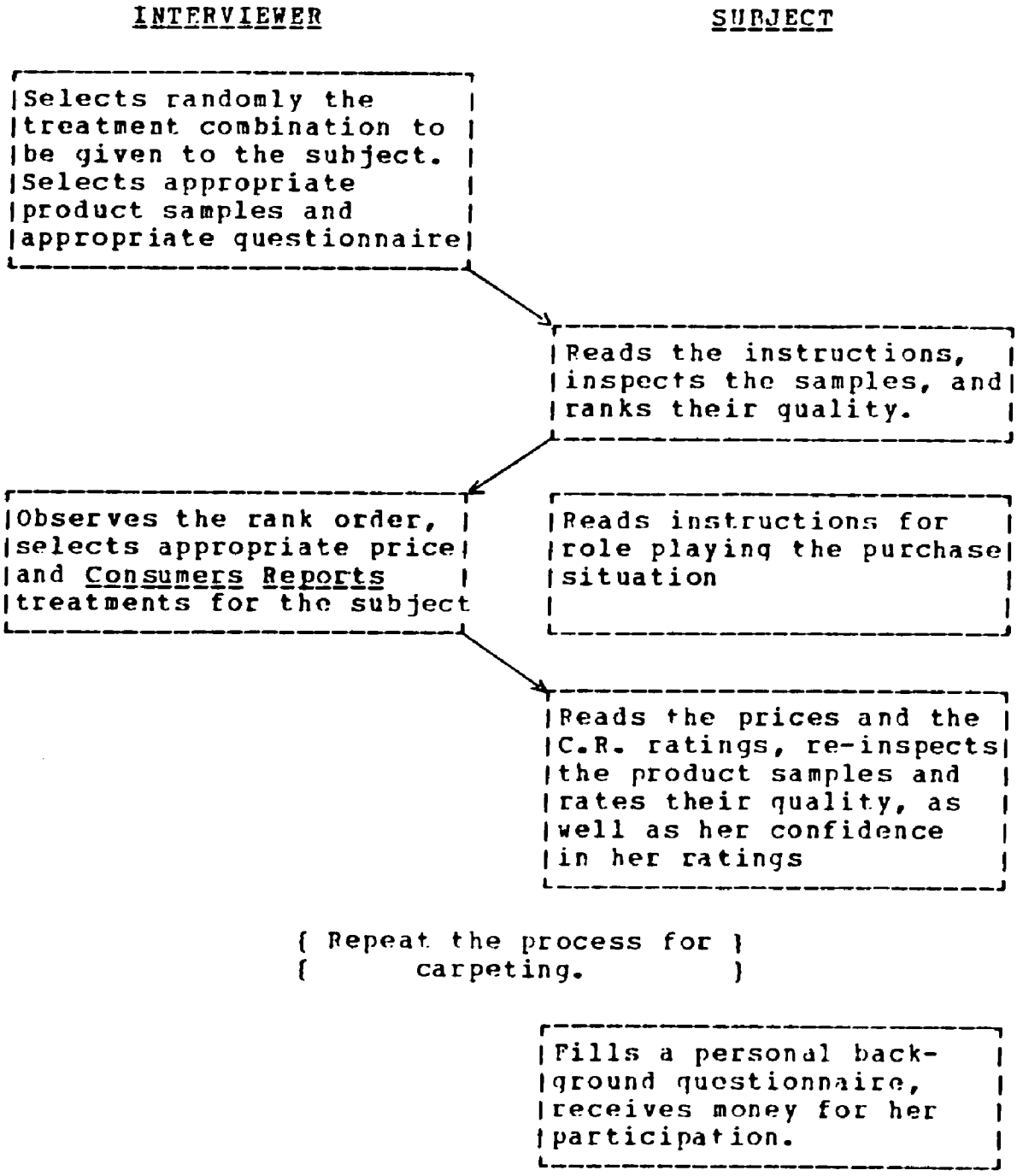


Figure 7.

The Flow of the Experimental Procedure

Two explicit information treatments were used, each representing one source of information. Treatment P varied the prices, and treatment C the Consumer Reports magazine's quality ratings of the product samples. Each of the factors P and C had two levels. Conditions P1 and C1 presented the subject with information that was consonant with the quality judgment that she had made prior to the information treatment. In conditions P2 and C2 the information was dissonant with the pretreatment judgment.

The arrangement of the P and C factors was accomplished by selecting discreetly a price list and a list of Consumer Reports ratings while the subject was reading the role-playing instructions. Figure 8 illustrates the contents of these lists for a subject who is to receive a consonant price treatment and a dissonant Consumer Reports rating treatment.

The lists of price and Consumer Reports rating treatments were given to the subject, who then reinspected the product samples. Her next task was to rate the quality of the samples on a discrete rating scale provided, and also to indicate her confidence in the quality judgment she just made. These ratings are the data of this study.

PRE-TREATMENT QUALITY RANKING	LIST OF PRICES PRESENTED TO THE SUBJECT (TOWELS)	LIST OF CONSUMER REPORTS' QUALITY RATINGS PRESENTED TO THE SUBJECT
K(highest)	K=$3.27	K=Fair-to-good quality
L	L=$2.67	L=Good-to-very good q'ty
M(lowest)	M=$2.19	M=Very good-to-excellent quality

Figure 8.

An Example of the Arrangement of a Consonant Price Treatment and a Dissonant Consumer Reports Quality Rating Treatment.

Each subject went through the above procedure twice, first with the towel samples and then with the carpet samples. Once she had finished rating the carpets she was given a questionnaire which asked for some personal background questions. After having completed this questionnaire she was given a payment of $2.50. Some subjects wanted to discuss the experiment, and the correctness of the information treatments, as well as their performance in rating the products. As it was essential that the subsequent subjects did not have prior knowledge of the experiment, neither the manipulation of the treatments, nor the actual purpose of the experiment was disclosed.

Subjects and Sample

Seventy-two percent of the subjects of this study were women from civic and church organizations in the Washtenaw County area of Michigan. 97 women from four women's groups volunteered to participate in the experiment. Six of these subjects were excluded from the study, because of their apparent misunderstanding of the task required of them. No systematic traits general to these subjects could be discerned. For each subject supplied the organization was paid $2.50.

Thirty-eight University of Michigan students' or faculty members' wives were also paid $2.50 to take part in the experiment. These women lived in a university housing project for married couples. One of these subjects was disqualified due to her unwillingness to complete the experiment.

The subjects were selected on an availability basis without any consideration of attaining a statistically representative sample of some target population. An effort was made to recruit subjects who might be expected to have somewhat different life styles. Appendix C gives a demographic profile of the sample.

For two reasons women were interviewed rather than men. First, pretests had indicated women to be more familiar with the two products, especially so with the bath towels. Women had purchased more of these products, and were thus expected to be less affected by the laboratory-type experimental purchase situation. Second, women were available for interviewing during various times of the day, and it was possible to contact them and schedule the interviews through the womens' organizations.

Summary of the Experiment

In order to analyze the effect of price information on perceived quality, a 2 • 2 • 2 • 2 • 2 random factorial experiment was designed. Quality ratings were collected from subjects for three samples of two products, as well as ratings of each subject's confidence in her quality judgment. 128 housewives were randomly placed on the blocks of the experimental design. The design of the purchase situation and information treatments is shown in Figure 9, and the linear statistical models that were used in the analyses are discussed in Appendix D. Analyses of the quality ratings were based on this design, and they are presented in the next chapter.

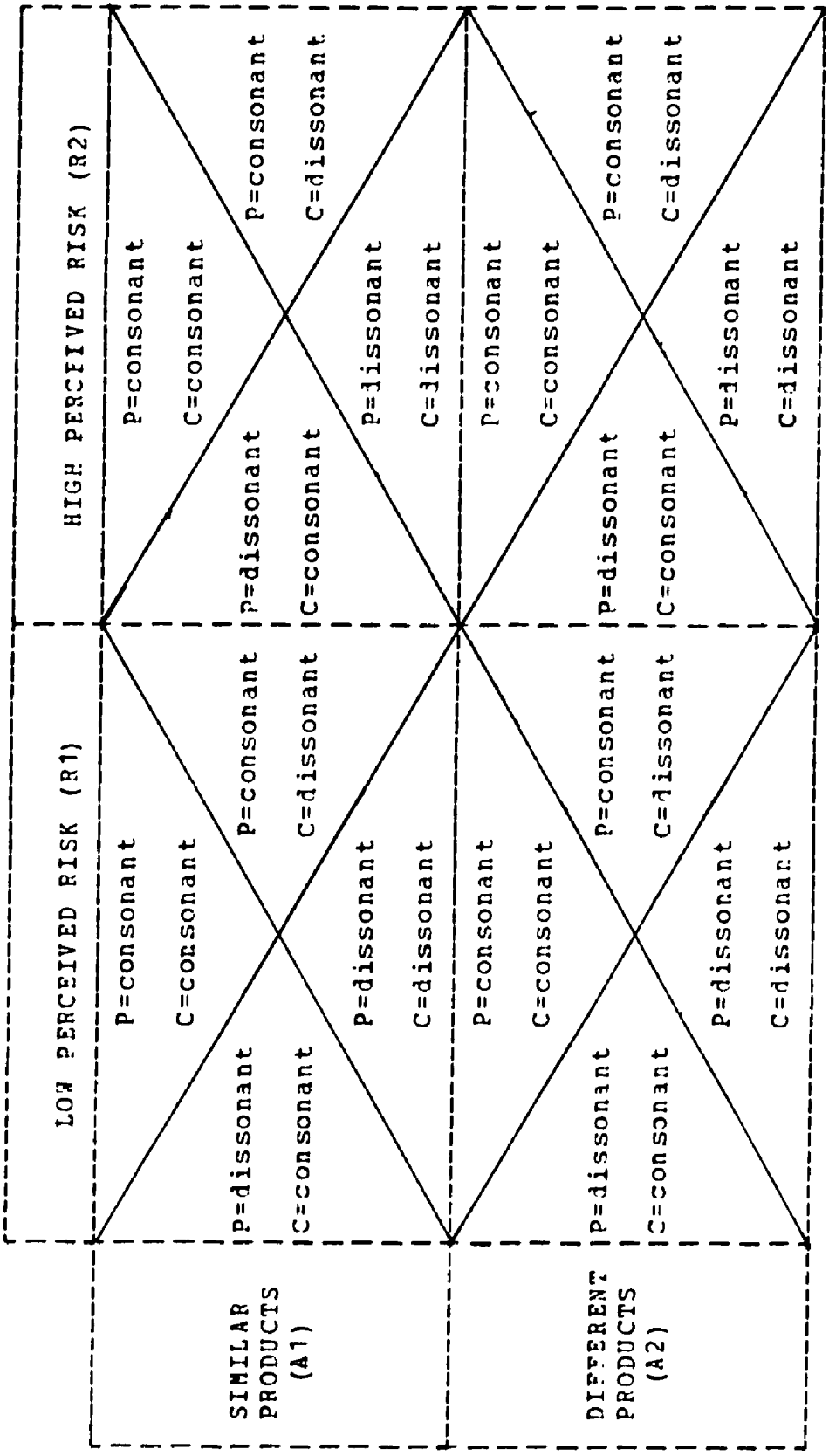


Figure 9. The Basic 2•2•2•2 Factorial Design

(P=Price treatment; C= Consumer Reports treatment)

CHAPTER V

RESULTS

This chapter presents the results of the 2•2•2•2•2 factorial design. The first section presents findings regarding the degree of similarity and dissimilarity within the product sets of the experiment, and results concerning the difficulty in rating the quality of the two products of the experiment. The second section presents the results of the experiment as they relate to each of the five hypotheses.

Analyses Concerning the Similarity Treatment and the Difficulty in Rating the Products

The first two hypotheses study the effects of products' (carpeting and towels) complexity and the degree of similarity on the price-quality relationship. A pilot test was used for the selection of the similar and dissimilar products. Data were collected in the main study to verify

the pilot test findings.

Similarity Between Products

The first hypothesis states that price reliance is more pronounced for a product when it is one of a set of similar, or non-differentiable products, than for a product from a set of different products. Sets of similar and different samples of towels and carpeting had been selected with pilot tests. It was intended that the subjects would be able to differentiate the quality of the different towel samples to a higher degree than they could discriminate the similar towel samples. This was tested by analyzing the rankings of the towel samples which the subjects had made before any information about the samples had been given to them.

Each of the subjects picked the towel of highest perceived quality from the set that she had been given to inspect. Rank orderings were formed from this pick first - pick last data. In forming the rank orderings no ties were allowed. It was assumed that the subjects are transitive in their quality judgments. Table 1 represents the frequencies of the various rank orderings. Tables 2 and 3 show the proportion of times that each of the towel samples was ranked first, second, and last.

RANKING OF TOWELS	SIMILAR TOWELS		DIFFERENT TOWELS	
	Number of Subjects	Percent of Total	Number of Subjects	Percent of Total
K > L > M	4	6.3	15	23.4
K > M > L	8	12.5	1	1.6
L > K > M	17	26.6	42	65.6
L > M > K	21	32.8	1	1.6
M > K > L	11	17.2	4	6.3
M > L > K	3	4.7	1	1.6
Total	64	100.1 %	64	100.1 %

Table 1

Frequencies of Subjects' Ranking of Similar and Different Towel Samples

	Proportion of Subjects Who Ranked Sample		
Sample	First	Second	Third
K	18.8 %	43.8 %	37.5 %
L	59.4	11.0	29.7
M	21.9	45.3	32.9

Table 2

The Proportion of Subjects Who Ranked
the Similar Towel Samples First, Second, or Third

	Proportion of Subjects Who Ranked Sample		
Sample	First	Second	Third
K	25.0 %	71.9 %	3.2 %
L	67.2	25.0	7.9
M	7.9	3.2	89.0

Table 3

The Proportion of Subjects Who Ranked
the Different Towel Samples First, Second, or Third[46]

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[46] Although the code letters of the similar and different towels are the same the products are not the same. The products behind the code letters are shown in Appendix A.

Almost two thirds of the subjects ranked the different towels in the order predicted by the pilot tests. Every fourth subject reversed the order of the first two towels L and K and only 11.1 % ranked the towels in a "mixed" order.

The subjects' ability to differentiate the different towels was tested with the Friedman two-way analysis of variance for rank ordered data.[47] The null hypothesis was that the three towels were drawn from the same population, i.e. the subjects perceived no differences between the towels. A Friedman T value 64.45 indicated that the hypothesis should be rejected, $P < 0.001$.[48] This was seen as sufficient evidence that the subjects did differentiate the different towel samples.

The data of Table 2 indicate that the subjects did not randomly rank the three similar towels. The towel L received more than its proportionate share of first place rankings although it was also ranked last by 30 % of the subjects. A Friedman test gave a T value of 8.66, $P < 0.05$, which showed that the subjects differentiated between the similar towels. Nevertheless, the rank order data and the tests pointed out that the similar towels were less

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[47] This test is explained in Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, (New York: John Wiley & Sons, 1956), pp. 166-172, and Myles Hollander and Douglas A. Wolfe, Nonparametric Statistical Methods, (New York: McGraw-Hill, 1973), pp. 138-146.

[48] Instead of the T values, chi-square values were used, because they are applicable for the T-test and are more conservative for a small number of degrees of freedom.

differentiable than the different towels. The two sets of product samples, therefore, can be used to test the effect of the degree of similarity between available product alternatives on price reliance.

Each subject also rated the quality of three samples of carpeting prior to the experimental manipulation. These data were first subjected to an analysis of variance with the hypothesis that the mean ratings of the carpet samples (of each set) were identical. Tables 4 and 5 represent the results. Again the hypothesis was rejected for both sets. The differences between the similar carpets were significant at a lower level of confidence than those of the different carpets. A test of the ranges of the mean ratings for the similar and different carpets was conducted using an analysis of variance having the range of the pretreatment ratings as a dependent variable and the degree of similarity as the treatment. The results are given in Table 6, and show that the hypothesis that the ranges were identical was rejected, $P < 0.05$. An analysis of the mean ranges indicated that the different carpets were rated less identical.

Based on this analysis, it was concluded that the subjects perceived the similar product samples more similar than the different product samples. Consequently, the similarity treatment manipulation was considered effective for testing the hypothesis 1.

SOURCE	DF	SUM OF SQRS	F-RATIO	SIGNIFIC.
Between Samples	2	23.45	3.21	P < 0.05
Within Samples	189	691.03		
Total	191	714.45		

CARPET SAMPLES	N	MEAN	STD.DEV.
R	64	4.58	3.01
S	64	4.18	4.84
T	64	4.73	3.12

Table 4

An Analysis of Variance of the
Pretreatment Ratings of the Similar Carpets Quality

SOURCE	DF	SUM OF SQRS	F-RATIO	SIGNIFIC.
Between Samples	2	281.26	65.68	P < 0.001
Within Samples	189	404.66		
Total	191	685.92		

CARPET SAMPLES	N	MEAN	STD.DEV.
R	64	5.61	1.38
S	64	2.72	1.24
T	64	4.73	1.73

Table 5

An Analysis of Variance of the
Pretreatment Ratings of the Different Carpets Quality

SOURCE	DF	SUM OF SQRS	F-RATIO	SIGNIFIC.
Between Sets	1	7.56	4.23	P < 0.05
Within Sets	126	223.43		
Total	126	230.99		

PRODUCT SETS	N	MEAN	STD.DEV.
Similar	64	3.76	1.38
Different	64	4.25	1.28

Table 6

An Analysis of Variance of the Range of Pretreatment Ratings of the Different Carpets Quality

Difficulty in Evaluating the Products

In order to test hypothesis 3 bath towels and carpeting had been selected to represent products whose quality is, respectively, easy and difficult to judge. The correctness of the product selection was investigated with data collected in the experiment. The subjects rated the degree of difficulty of evaluating the two products' quality on a five point scale: Very difficult to judge (1): + + + :(5) Very easy to judge. These ratings were subjected to a one-way analysis of variance with the hypothesis that the products were equally difficult to evaluate. Table 7 gives the results of this analysis.

The hypothesis that the two products were equally difficult to evaluate was rejected, $P < 0.001$. The mean scores indicate that the subjects considered towels easier to judge than samples of carpeting. This result was also supported by the pilot tests of the product sets, in which the rankings of the carpet samples were apparently made more in a random way than the rankings of the towels, see Appendix A. Consequently, the selected product samples were suitable for testing the hypothesis 3.

SOURCE	DF	SUM OF SQRS	F-RATIO	SIGNIFIC.
Between Products	1	185.6	157.6	P < 0.001
Within Products	254	299.1		
Total	255	484.7		

PRODUCTS	N	MEAN	STD.DEV.
Towels	128	3.78	1.17
Carpeting	128	2.08	0.99

Table 7

An Analysis Of Variance Of The Difficulty In Evaluating The Quality Of Towels And Carpeting

Data and Analysis Technique

Quality ratings of the three samples of the two products constituted the raw data of the analyses of the price-quality relationship. The ratings were made on a seven point scale; Very poor quality (1): + + + + + :(7) Very high quality. Analyses of the ratings were made with a five-way multivariate analysis of variance having the ratings of the product samples as dependent variables. Four-way analyses of variance with each sample as the sole dependent variable were also made. The linear statistical models behind these analyses are presented in Appendix D.

Tables 8 - 11 represent the four-way variance analyses of the samples of carpeting and towels that were rated first and third by each subject, and Table 12 shows the significant source effects of the five-way MANOVA analysis. The complete listing of the MANOVA analysis is presented in Appendix E.[49]

It should be pointed out that the dependent variables of these analyses are not the quality ratings of a product sample, such as R or S, but ratings of the sample ranked first or third by the subject on the basis of product

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[49] The sample that was ranked second by each subject is not included in the analyses because the information treatments P and C were designed not to affect it at all. A five-way analysis of variance of the sample 2 indicated that the information treatments functioned as was planned. Neither of the treatments P and C had a significant effect on the quality ratings of sample 2.

inspection alone. Consider, for example, a subject who ranked three carpet samples R > S > T prior to receiving the perceived risk and the information treatments. In her case the dependent variables, which are called sample 1, 2, and 3, would be the quality ratings of R, S, and T, respectively. If the subject would have ranked the carpets T > S > R, sample 1 and sample 3 would refer to the ratings of T and R, respectively. When the analysis is restricted to either towels' ratings or carpets' ratings the dependent variables are denoted towel 1, 2, and 3, and carpet 1, 2, and 3.

Organizing the dependent variables in this fashion is consistent with the arrangement of the information treatments, which either confirmed the subject's pretreatment ranking or gave information that was exactly opposite to the ranking. The additional advantage of this approach over analyzing the ratings of each product sample was in its capability to allow for testing hypotheses separately for the product sample that the subject considered best in quality or lowest in quality. It was hoped that the analysis would pinpoint possible differences in the degree of price reliance for the first and the last product.

The drawback of the technique was that a treatment was not always associated with the same product sample because the subjects did not always rate the same samples first and last in quality. This problem is of less importance for the sets of similar samples. A treatment administered to any

product of a set of non-differentiable products will presumably have the same effect on the quality judgment that the subject makes. The effect of a treatment on product S's quality, however, may be different from the effect of the same treatment on product R's rating when the products are different and differentiable.

In this experiment the treatments for the different towel samples did affect the subjects' quality rating of the same products most of the time. Table 3 shows that 67.2 % of the subjects ranked towel L first, and 89 % ranked sample M last. Unfortunately, these numbers for the different samples of carpeting were smaller; R was rated first by 51.7 %, and S last by 48.5 % of the subjects. The approach of analyzing first and last samples as dependent variables was, nevertheless, taken. The assumption was that the results were not affected by the slightly mixed ordering of the different carpet samples.

	DF	SUM OF SQUARES	F-RATIO	SIGNIFICANCE
Anova Error	112	241.88		
C • P • R • A	1	0.20	0.09	
P • R • A	1	0.63	0.29	
C • R • A	1	0.38	0.18	
C • P • A	1	1.32	0.61	
C • P • R	1	3.44	1.60	
R • A	1	14.44	6.69	P < 0.01
P • A	1	0.00	0.00	
P • R	1	13.13	6.08	P < 0.025
C • A	1	2.82	1.30	
C • R	1	0.07	0.03	
C • P	1	0.07	0.03	
Product Similarity (=A)	1	4.88	2.26	
Perceived Risk (=R)	1	0.38	0.18	
Price Information (=P)	1	4.13	1.91	
Cons.Reports' Infor. (=C)	1	8.51	3.94	P < 0.05
Grand Mean	1	4174.67	1933.08	

Table 8

Four-way Analysis of Variance
of the Quality Ratings of Towel 1

	DF	SUM OF SQUARES	F-RATIO	SIGNIFICANCE
Anova Error	112	367.00		
C • P • R • A	1	1.53	0.47	
P • R • A	1	0.78	0.23	
C • R • A	1	1.53	0.47	
C • P • A	1	4.50	1.38	
C • P • R	1	3.78	1.15	
R • A	1	2.53	0.77	
P • A	1	3.12	0.95	
P • R	1	7.03	2.15	
C • A	1	0.13	0.03	
C • R	1	0.03	0.01	
C • P	1	0.50	0.15	
Product Similarity (=A)	1	0.12	0.03	
Perceived Risk (=R)	1	0.28	0.09	
Price Information (=P)	1	15.12	4.62	P < 0.05
Cons.Reports' Infor. (=C)	1	32.00	9.77	P < 0.005
Grand Mean	1	1058.00	322.87	

Table 9

Four-way Analysis of Variance
of the Quality Ratings of Towel 3

	DF	SUM OF SQUARES	F-RATIO	SIGNIFICANCE
Anova Error	112	224.25		
C • P • R • A	1	4.50	2.25	
P • R • A	1	9.03	4.51	P < 0.05
C • R • A	1	0.12	0.06	
C • P • A	1	1.53	0.76	
C • P • R	1	12.50	6.24	P < 0.025
R • A	1	0.78	0.39	
P • A	1	4.50	2.25	
P • R	1	0.78	0.39	
C • A	1	0.78	0.39	
C • R	1	10.12	5.06	P < 0.05
C • P	1	3.78	1.89	
Product Similarity (=A)	1	0.00	0.00	
Perceived Risk (=R)	1	0.03	0.01	
Price Information (=P)	1	21.12	10.56	P < 0.005
Cons.Reports' Infor. (=C)	1	75.03	37.47	P < 0.001
Grand Mean	1	3741.09	1868.46	

Table 10

Four-way Analysis of Variance
of the Quality Ratings of Carpet 1

	DF	SUM OF SQUARES	F-RATIO	SIGNIFICANCE
Anova Error	112	333.00		
C • P • R • A	1	0.78	0.26	
P • R • A	1	2.53	0.85	
C • R • A	1	0.03	0.01	
C • P • A	1	0.12	0.04	
C • P • R	1	9.03	3.04	P < 0.10
R • A	1	0.28	0.09	
P • A	1	8.00	2.69	P < 0.10
P • R	1	0.03	0.01	
C • A	1	0.12	0.04	
C • R	1	11.28	3.79	P < 0.10
C • P	1	4.50	1.51	
Product Similarity (=A)	1	18.00	6.05	P < 0.025
Perceived Risk (=R)	1	5.28	1.78	
Price Information (=P)	1	4.50	1.51	
Cons.Reports' Infor. (=C)	1	72.00	24.21	P < 0.001
Grand Mean	1	1404.49	472.38	

Table 11

Four-way Analysis of Variance
of the Quality Ratings of Carpet 3.

SOURCE OF VARIATION	MULTIPLE F-RATIO	SIGNIFIC.	F-RATIO OF SAMPLE 1	SIGNIFIC.	F-RATIO OF SAMPLE 3	SIGNIFIC.
P • R • A	1.76		3.47	P < 0.10	0.08	
C • P • R	4.29	P < 0.025	6.99	P < 0.01	3.92	P < 0.05
R • A	2.64	P < 0.10	5.27	P < 0.025	0.72	
P • A	1.85		1.17		3.38	P < 0.10
P • R	2.50	P < 0.10	4.88	P < 0.05	0.98	
C • P	4.00	P < 0.025	7.93	P < 0.005	1.28	
C • R	1.89		2.86	P < 0.10	2.00	
Product	2.63	P < 0.10	2.85	P < 0.10	3.92	P < 0.05
Price (P)	6.43	P < 0.005	10.56	P < 0.005	5.78	P < 0.025
C.R. (C)	24.84	P < 0.001	32.21	P < 0.001	32.00	P < 0.001
D.F.	2;223		1;224		1;224	

Table 12

The Significant Source Effects of the Five-way Multivariate Analysis of Variance of the Quality Ratings of Product Samples Ranked First and Last by the Subjects

Testing the Hypotheses

Hypothesis 1

Hypothesis 1 states that the consumer will utilize both price information and Consumer Reports ratings for his quality judgment, the latter being the stronger cue of quality. The results of this experiment supported this hypothesis. Table 12 indicates that the main effects of price and Consumer Reports treatments were both significant beyond the $P < 0.025$ level for both product samples. Due to the consonant/dissonant arrangement of these treatments it was expected that the mean ratings of sample 1 would be higher for the consonant conditions of the two treatments than for the dissonant conditions. The reverse was expected for sample 3 ratings. Table 13 confirmed these expectations.

In addition to the MANOVA results the four-way ANOVAs of the towels and carpets that were rated first and last are analyzed to provide additional insight into the process of quality perception.[50] Tables 8 and 11 revealed that price treatment was not significant for towel 1 and carpet 3 while Consumer Reports treatment was significant for all product samples.

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[50] It was understood that the variance estimates of the five-factor and the four-factor models are not necessarily comparable. Special care was taken not to present results of the four-way analyses which were not confirmed by the full linear model of the complete data.

Mean Quality Rating of	C1: Consonant C.R. Treatment	C2: Dissonant C.R. Treatment
Sample 1	6.07	5.05
Sample 3	2.46	3.72
	P1: Consonant Price Treatment	P2: Dissonant Price Treatment
Sample 1	5.85	5.26
Sample 3	2.92	3.36

Table 13

Mean Quality Ratings of Product Samples 1 and 3

for Treatments P and C

The only other main effect that was significant was that of products. No further analyses of the means of this treatment are presented.

Hypothesis 2

Hypothesis 2 states that the price-quality relationship is stronger in situations where the available product alternatives are perceived to be similar than when they are perceived to be different. This hypothesis was tested by analyzing the P • A and P • R • A interactions in the variance analyses. For the hypothesis 2 to be accepted the P • A interaction should have a significant effect on the quality ratings.

Table 12 indicates that the interactive effect of the price treatment and the similarity treatment, P • A , is significant beyond the $P < 0.10$ level for sample 3. For hypothesis 2 to be supported a dissonant price treatment should improve the quality rating of sample 3 more when it is presented in the set of similar products than when it belongs to the set of different product samples. This was indeed the case. When sample 3 was presented as one of the different products price information had practically no effect on the rated quality. When sample 3 was one of the similar products, however, the price treatment had a definite effect on its ratings. In this condition the mean quality rating of sample 3 was 2.82 when consonant price information was presented. Dissonant price information gave a

message that sample 3 was the best of the three similar products, which cue improved the mean rating to 3.76. A graphical representation of the two-way interaction P • A for sample 3 is shown in Figure 10.

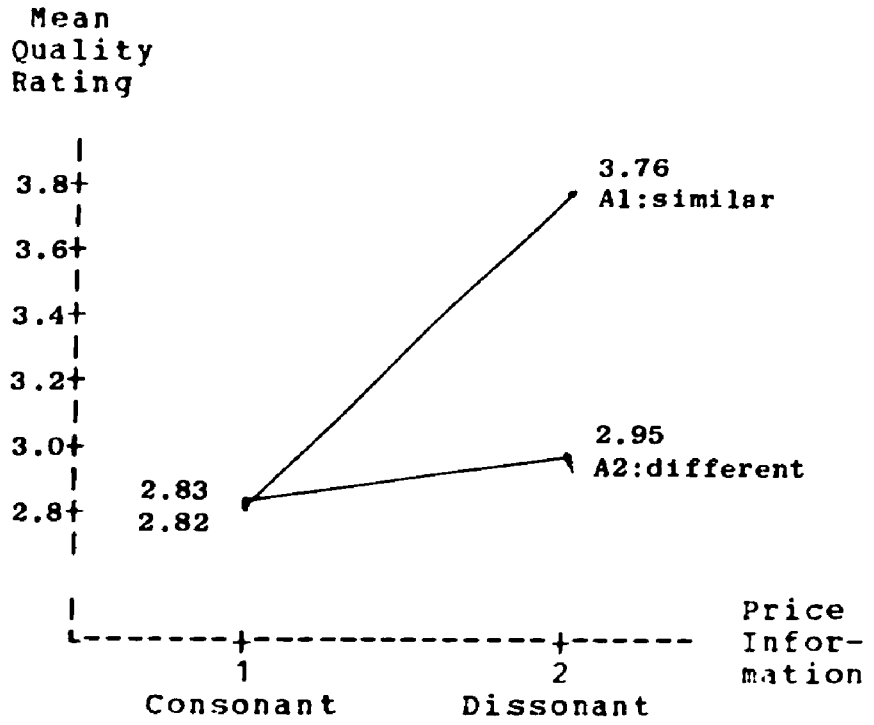


Figure 10.

The Effect of Price Information on the Quality Rating of Product Sample 3 for the Similar and Different Conditions

Prior to receiving the price treatment the subject had ranked sample 2 better in quality than sample 3. Another measure of the effect of the treatment is the number of subjects who reversed this ordering because of the price information. Less than 18 % of the subjects who received a consonant price treatment or who inspected different product samples reversed their earlier ordering. This compared with 38 % for the subjects who evaluated similar products and received a dissonant price treatment. The effect of dissonant price information for the subjects in this treatment cell was also visible in the sizable standard deviation of the treatment combination A1 • P2, 2.25 as compared with a range of 1.63 - 1.77 for the other three cells. Altogether the evidence pointed out that hypothesis 2 should be accepted for product sample 3 even though the significance of the P • A effect was only 0.10.

The similarity treatment did not directly mediate the effect of price information on the quality perceived in product sample 1. Table 12 indicates, however, that the relationship between price information and the rated quality of sample 1 is mediated by the joint effect of the degree of similarity between products and perceived risk. The P • R • A effect for sample 1 is significant beyond the level $P < 0.10$. Further, the four-way analyses of variance show that the P • R • A effect was significant only for carpet sample 1. Figures 11 and 12 represent the P • R • A interaction for carpet 1.

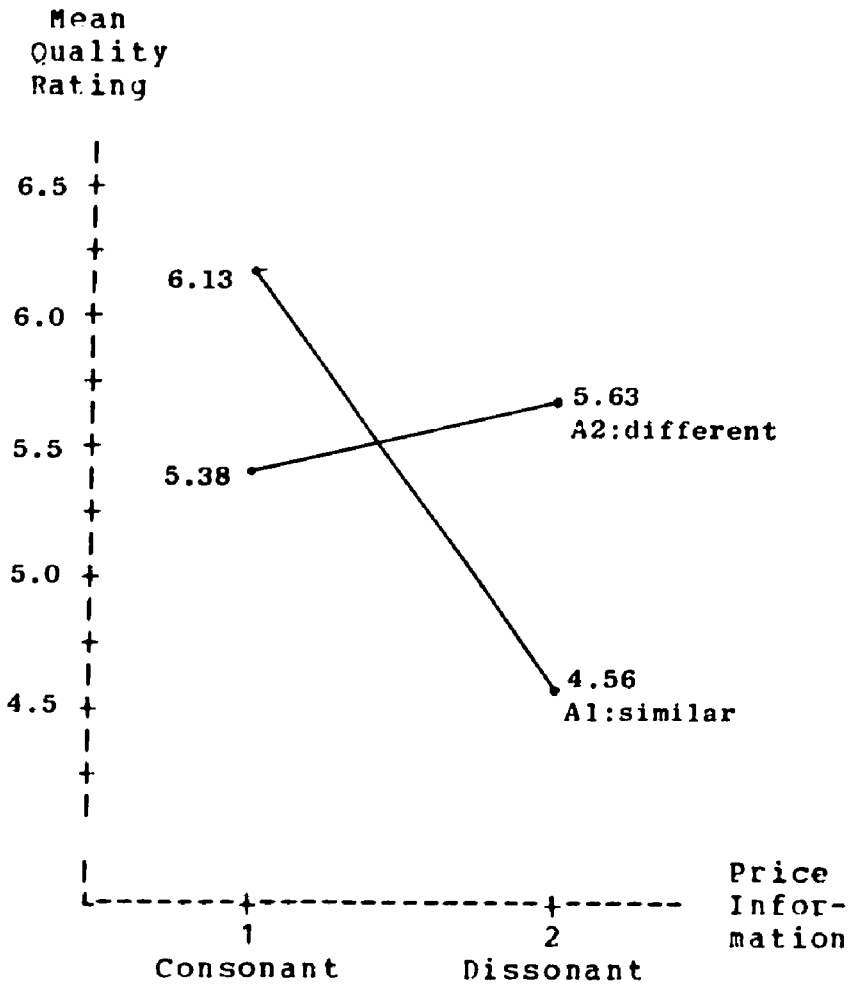


Figure 11.

The Effect of Price Information on the Quality Rating of Carpet Sample 1 In the Condition of Low Perceived Risk for Similar and Different Conditions

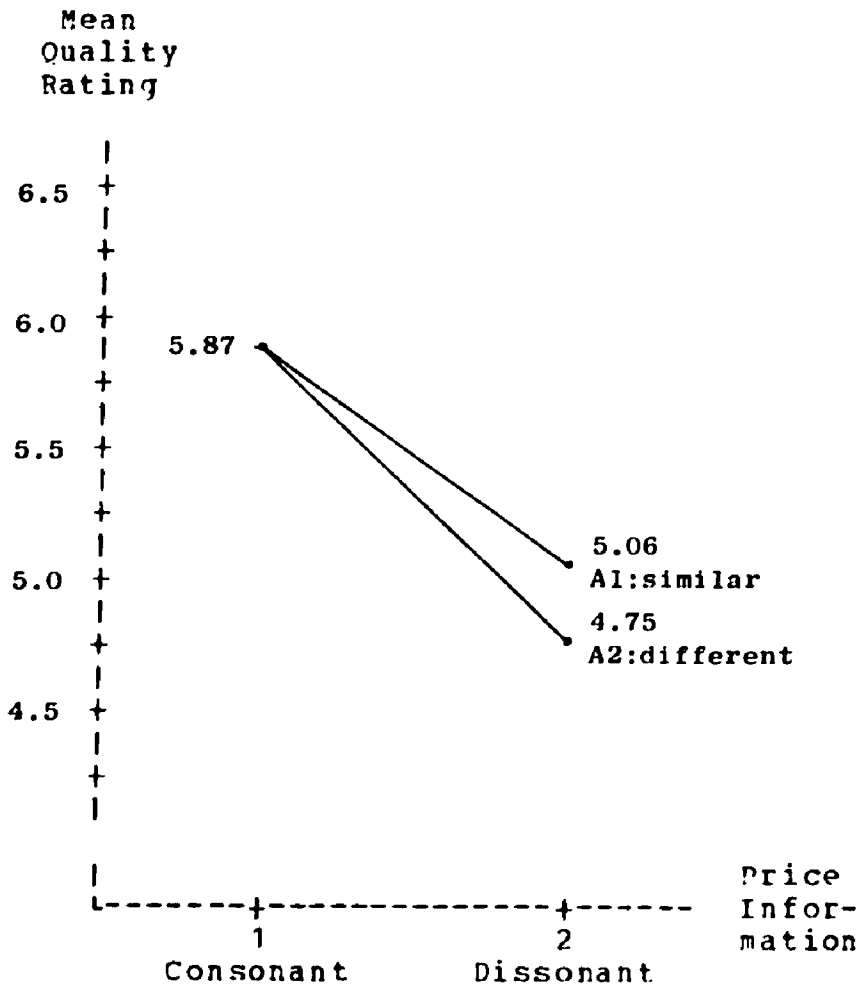


Figure 12.

The Effect of Price Information on the Quality Rating of Carpet Sample 1 In the Condition of High Perceived Risk for Similar and Different Conditions

Figure 12 reveals that hypothesis 2 was not supported for the condition of high perceived risk. Dissonant price information decreased the quality rating of carpet 1 for about a constant amount regardless of its belonging to the set of similar or different carpets.[51] In the case of low risk hypothesis 1 was confirmed (see Figure 11). Dissonant price information decreased the quality rating of carpet 1 considerably when it was one of the similar carpets, and increased the rating slightly in the condition A2.[52]

In summary, hypothesis 2 was supported by the results although not with high levels of significance for sample 3, and only in the condition of low perceived risk for product sample 1. For sample 1 the P • R • A interaction was largely due to the effect of price treatment on the rated quality of carpet 1; the quality perceived in towel 1 was not affected differentially by the price treatment in the two conditions of the R • A interaction.

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[51] Contrary to hypothesis 2 the decrease was smaller in the condition A1 (=similar) than in the condition A2. The difference between the decreases was not significant. A t-test gives (5.06 - 4.75)/1.75 = 0.177 with N=128.

[52] The increase was not significant: (5.87 - 5.53)/1.97 = 0.173, N=64, t-test.

Hypothesis 3

Hypothesis 3 states that the effect of price information on perceived quality is greater for a product that is difficult to evaluate than for a product which is easy to evaluate. The Price • Product interaction, then, should have a significant effect on the ratings. The previous analyses showed that the subjects considered the quality of towels significantly easier to assess than that of carpeting. The results of the MANOVA analysis do not support hypothesis 3. The interaction between price treatment and the two products had no effect on the quality ratings. This finding contradicted the theoretical considerations presented in Chapter III, as well as some of the earlier research results.[53]

Hypothesis 3 was based on the observation that the subjects would experience less cognitive uncertainty when judging the quality of an easy to evaluate product (Figure 4 in Chapter III). To verify the correctness of this reasoning the subjects' ratings of confidence in their quality ratings of the two products were analyzed. An analysis of variance was performed with the two products as the sole treatment with the hypothesis that the subjects were equally confident in judging the two products. Table 14 shows the results.

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[53] Lambert, ibid., had found that price reliance increases directly with the subject's ability to evaluate product's quality.

SOURCE	DF	SUM OF SQRS	F-RATIO	SIGNIFIC.
Between Products	1	17.5	10.5	P < 0.005
Within Products	254	422.3		
Total	255	439.8		

PRODUCTS	N	MEAN	STD.DEV.
Towels	128	2.44	1.30
Carpeting	128	2.96	1.28

Table 14

An Analysis of Variance of the
Subject's Confidence in Her Quality Ratings of
Towels and Carpeting

The analysis indicates that subjects were significantly, $P < 0.025$, more confident in their ratings of towels' quality than carpets' quality. It is likely, therefore, that the subjects experienced more cognitive uncertainty when judging carpeting than when evaluating towels. Hypothesis 3, though, was not supported by the results.[54]

The theoretical considerations behind hypothesis 3 showed that, in general, the consumer uses more explicit information for his quality judgments when he is judging a complex product than when the product is easy to evaluate. This more general hypothesis was supported by the highly significant, $P < 0.005$, interactive effect of the Consumer Reports treatment and the two products on the quality rating of sample 1. The C • T effect was not significant for sample 3. A graphical presentation of this interaction is shown in Figure 13.[55]

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[54] A significant P • T effect was found for sample 2, $P < 0.05$, see Appendix E. An analysis of the mean ratings showed that dissonant price information improved the mean quality rating of the towel sample 2 from 3.9 to 4.4, and decreased the mean rating of the carpet sample 2 from 4.7 to 4.5. This was the only unexpected significant source effect for the sample 2. Even extensive analyses failed to give an explanation for this finding.

[55] An analysis of variance of the subjects' confidence ratings were also made to see if the theoretical base of the hypothesis with respect to the Consumer Reports information was as predicted. Highly significant ($P < 0.001$) differences between the effects of consonant and dissonant conditions were found for both products. Consonant information was associated with higher levels of confidence than dissonant information.

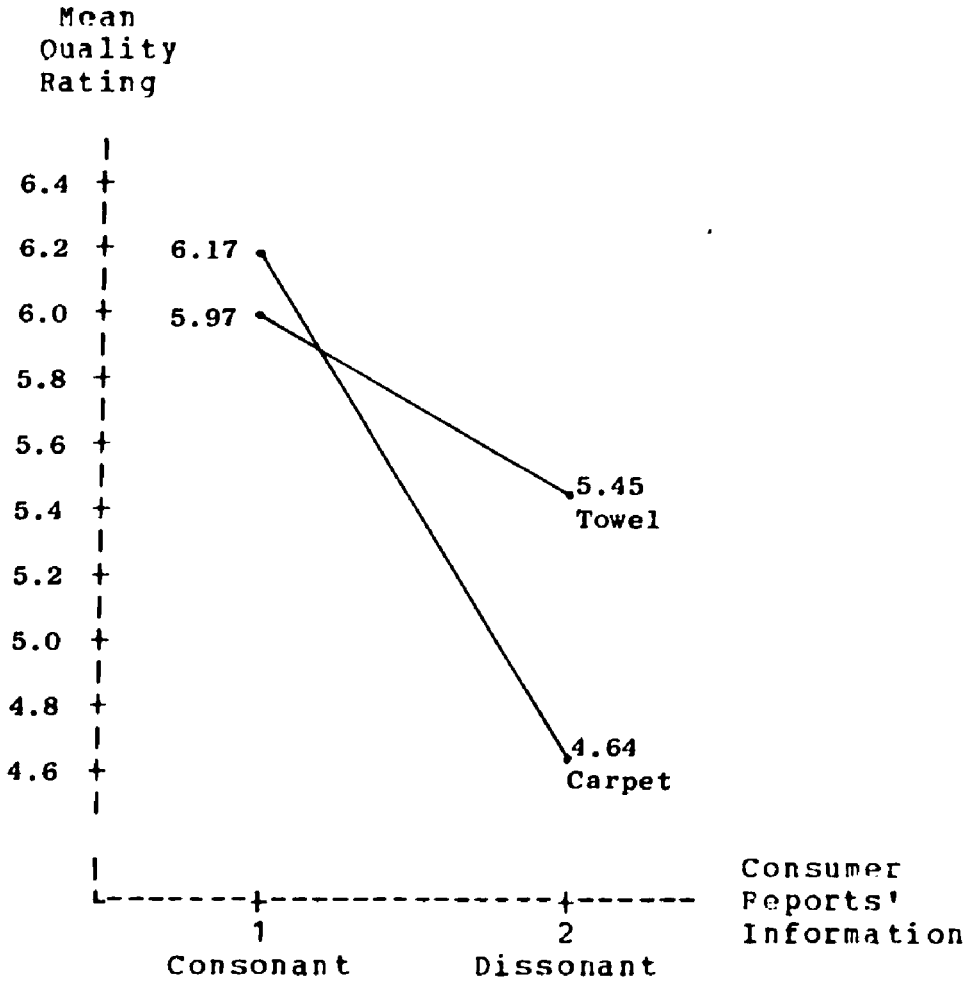


Figure 13

The Effect of Consumer Reports' Information on the Quality Ratings of Product Sample 1 for the Two Products

The magnitudes of the two products' mean quality ratings with which the consonant and dissonant Consumer Reports treatment conditions were associated support the more general hypothesis 3. Dissonant information decreased the quality perceived in towel 1 considerably less than that of carpet 1. An analysis of the rankings showed that only 18 of the possible 64 subjects reversed their pretreatment ranking of the towels 1 and 2, while every other subject reversed her ranking of the carpets 1 and 2. The increased tendency to reverse the pretreatment ranking of carpets 1 and 2 was also visible in the mean quality ratings of towels 1 and 2 and carpets 1 and 2 in the condition C2 (=dissonant). For carpets 1 and 2 the means were 4.64 and 4.59, respectively; for the towels 1 and 2 5.45 and 4.68, respectively. In conclusion, it appears that the Consumer Reports treatment did not exercise much influence on the subjects' evaluations of quality in towels. It, however, did affect their perception of the quality of carpeting.

Hypothesis 4

Hypothesis 4 states that when the consumer perceives a high level of risk in the purpose for which he is evaluating the product he is more prone to use price information and Consumer Reports information as cues of quality. In terms of the variance analyses the source effects which have a P • R interaction should be significant for this hypothesis to be supported. Analyses of the data revealed that this hy-

pothesis is supported in a convincing manner.

First, the five-way MANOVA analysis indicates that the interactive effect of price treatment and perceived risk treatment was significant beyond the $P < 0.10$ level. This effect was significant for product sample 1, $P < 0.05$, but was not significant for sample 3. The effect of Consumer Reports treatment on the quality ratings of sample 1 was also mediated by the risk treatment; C • R was significant beyond the $P < 0.10$ level for sample 1.

The hypothesis predicted that dissonant explicit information will decrease the quality ratings of sample 1 more in the condition of high risk than in the low risk condition. Figures 14 and 15 represent the mean ratings of sample 1. They show that the effects predicted by the hypothesis were found. An investigation of the four-way analysis of variance tables indicates that the P • R interaction was significant only for towel 1 and the C • R interaction only for carpet 1.[56]

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[56] The differences in the effects of P • R and C • R for the two products may be the result of the differing role-play situations that were used to create the risk treatments.

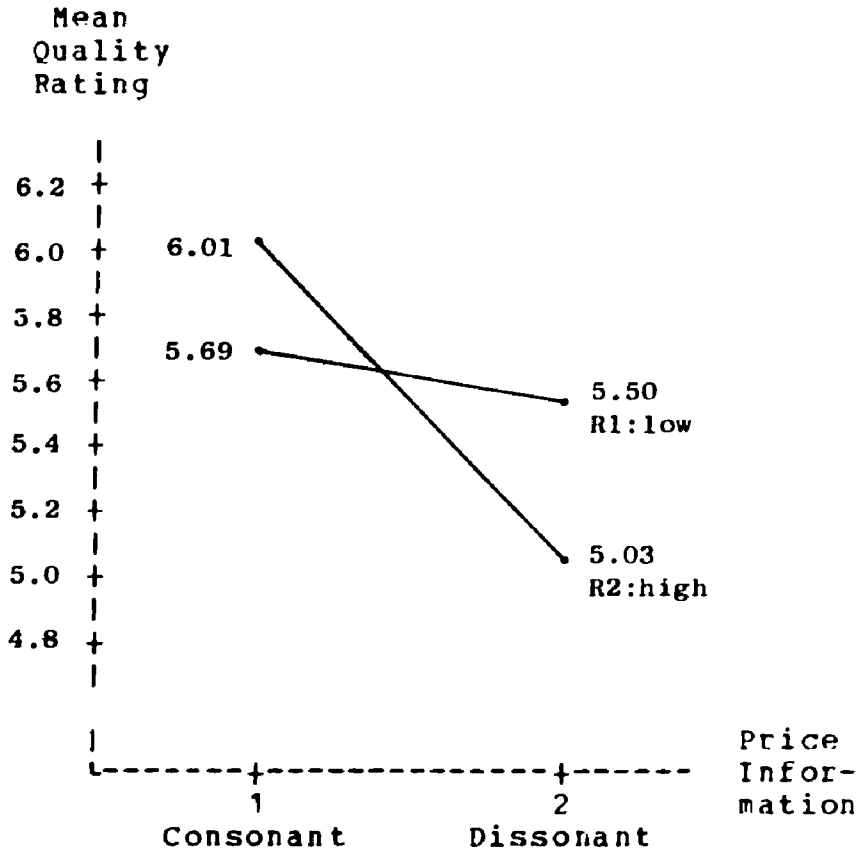


Figure 14.

The Effect of Price Information on the Quality Rating of Product Sample 1 in Conditions of Low and High Perceived Risk

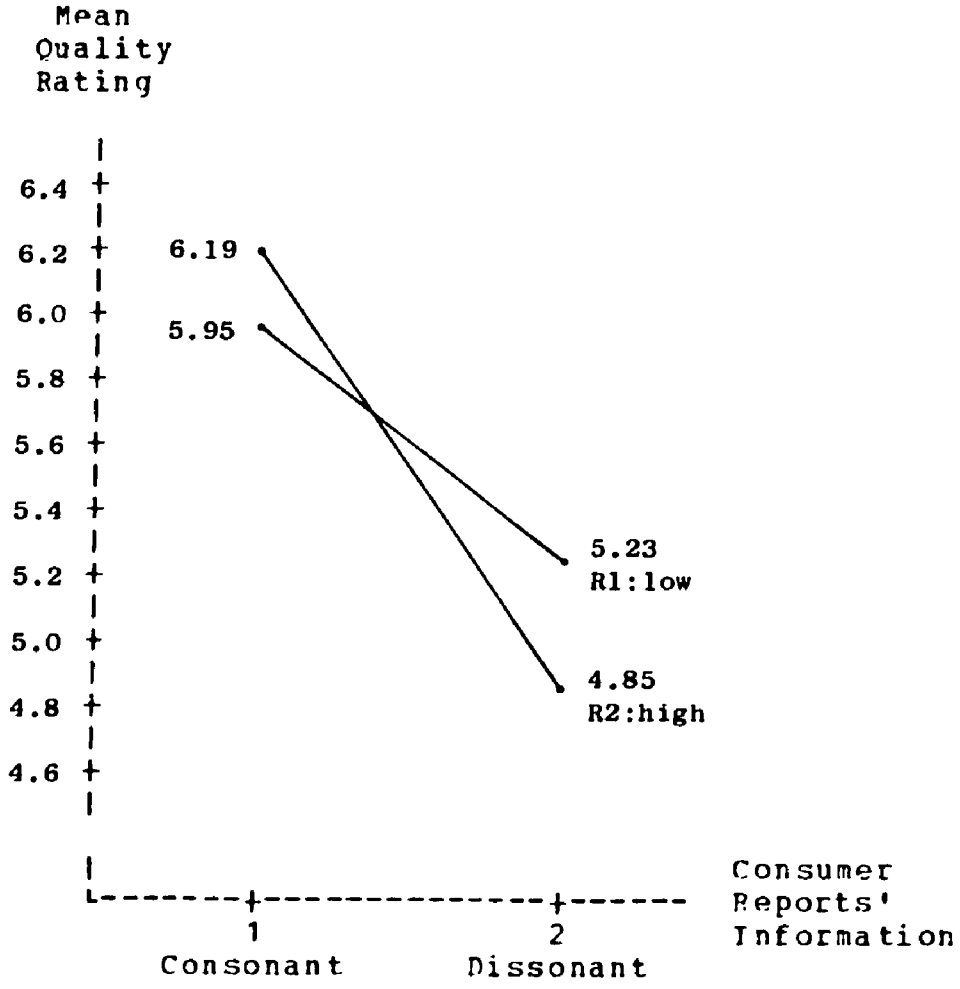


Figure 15.

The Effect of Consumer Reports Information on the Quality Perceived in Product Sample 1 in Conditions of Low and High Risk

Second, the P • R • A effect was significant for sample 1, $P < 0.10$. This interaction has been discussed above, and presented graphically in Figures 11 and 12.

Third, the three-way interaction of price, Consumer Reports information, and perceived risk treatments had a significant effect on the quality ratings of both product samples 1 and 3 at the levels of $P < 0.01$ and $P < 0.05$, respectively. The separate analyses of the carpet and the towel samples showed that the C • P • R effect was significant only for carpets 1 and 3. Figures 16 and 17 represent the mean ratings of carpet 1 and Figures 18 and 19 the mean ratings of carpet 3 for the treatment combinations of the C • P • R interaction.

The interaction figures reveal a consistent pattern of the combined effect of dissonant messages from the two sources of explicit information. In the low risk condition dissonant price treatment decreased the rated quality of carpet sample 1. This decrease did not vary noticeably across the two conditions of the Consumer Reports treatment. In other words, the subjects of the low risk situation rated the quality of carpet 1 down if either the price treatment or Consumer Reports treatment were dissonant with the quality judgment that they had made. They did no further downrating, though if both of the explicit information treatments were dissonant with their pretreatment product evaluation. Figure 18 reveals a similar finding for carpet 3 in the condition of low perceived risk.

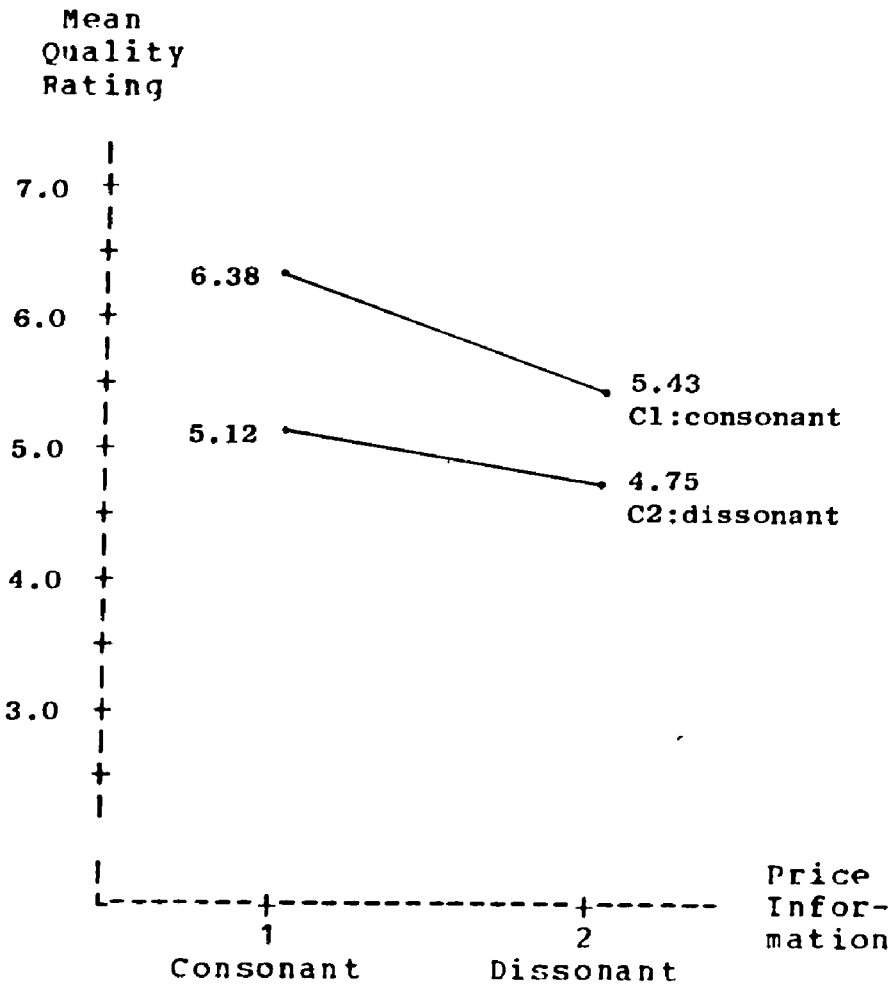


Figure 16.

The Effect of Price Information on the Quality Rating of Carpet Sample 1 in the Condition of Low Perceived Risk for the Consonant and Dissonant Consumer Reports Treatments

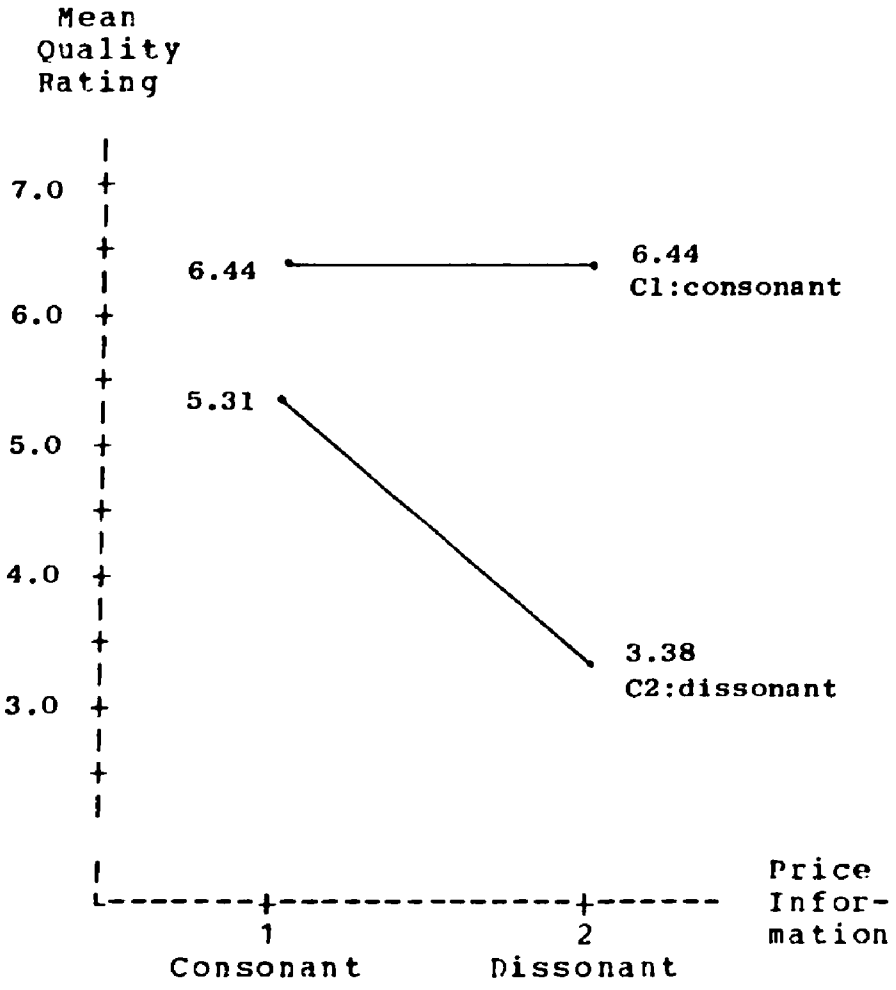


Figure 17.

The Effect of Price Information on the Quality Rating of Carpet Sample 1 in the Condition of High Perceived Risk for the Consonant and Dissonant Consumer Reports Treatments

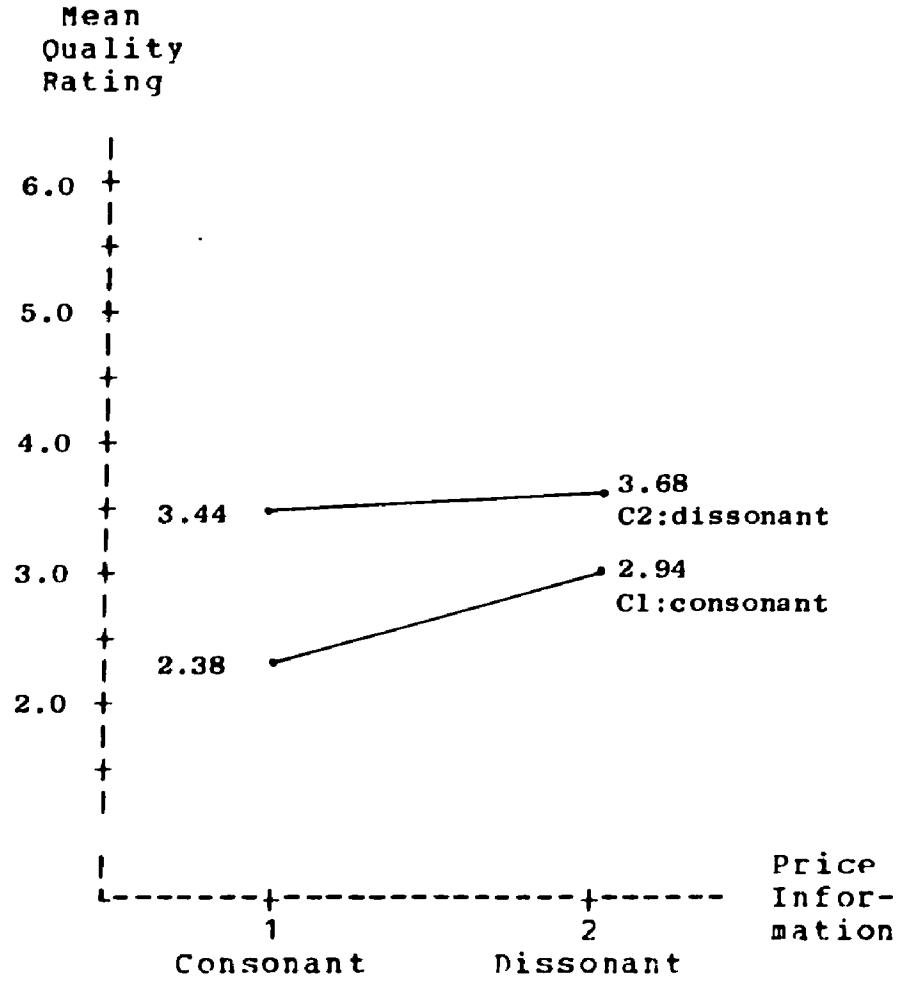


Figure 18.

The Effect of Price Information on the Quality Rating of Carpet Sample 3 in the Condition of Low Perceived Risk for the Consonant and Dissonant Consumer Reports Treatments

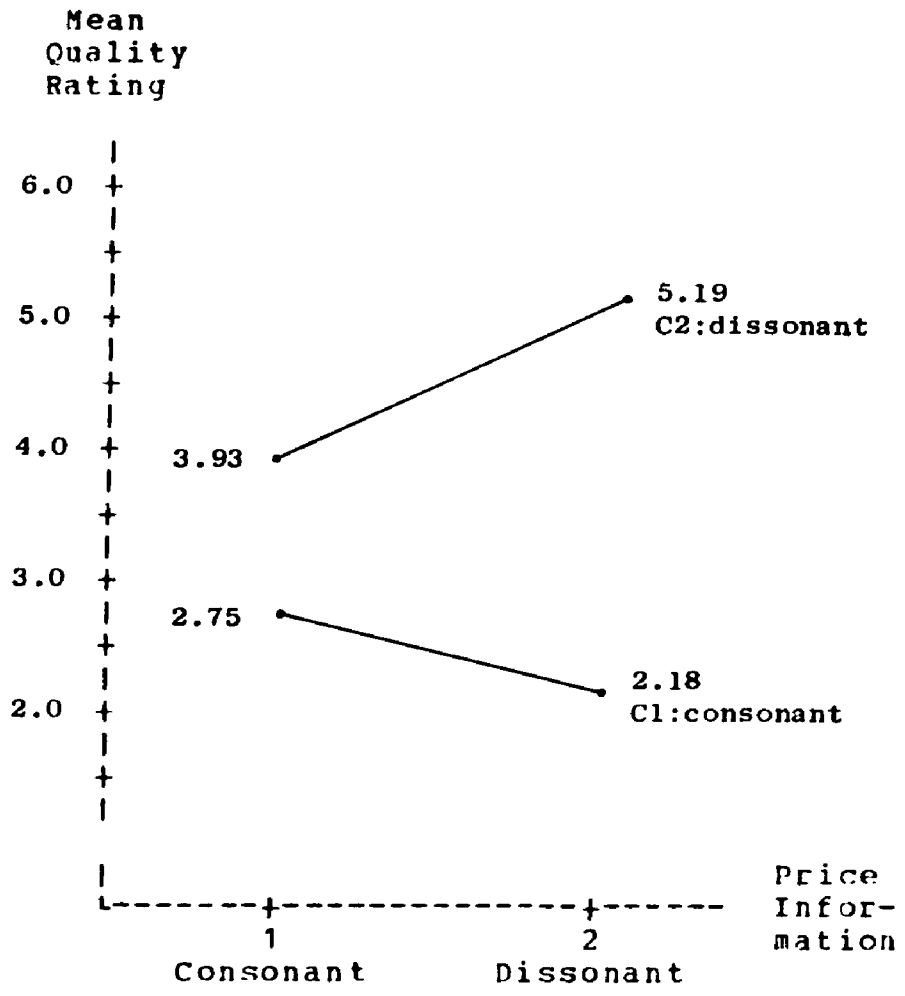


Figure 19.

The Effect of Price Information on the Quality Rating of Carpet Sample 3 in the Condition of High Perceived Risk for the Consonant and Dissonant Consumer Reports Treatments

The quality of carpet 3 was rated higher when either price or Consumer Reports information suggested that carpet 3 was the best of the three carpets, but not any higher when both P and C treatments were dissonant.

In the high risk condition dissonant price treatment did not decrease the mean rating of carpet 1 much when Consumer Reports treatment was consonant. The decrease caused by by a dissonant C treatment was also small. But when both treatments were dissonant the mean rating of carpet 1 decreased markedly, from 5.31 to 3.88. Figure 20 indicates a similar finding for carpet 3. The combined effect of dissonant price treatment and dissonant Consumer Reports treatment caused a remarkable increase in its mean quality rating.

The C • P • R interaction can be summarized by saying that in the high risk condition the combined effect of dissonant price and Consumer Reports treatments caused a substantial change in the subjects' perceptions of quality in carpet 1 and carpet 3, which was not the case in the low risk condition. This finding supports hypothesis 4 over and above the two-way interaction P • R and C • R. It shows that the combined effect of dissonant explicit information cues has an effect on the quality ratings only in the case when the subjects face a high risk situation.

In summary, the hypothesis about the mediating effect of perceived risk on price reliance was strongly supported by the results. Further, the level of risk also seemed to affect the utilization of Consumer Reports information as a cue of quality.

Hypothesis 5

This hypothesis states that dissonant price information has less effect on the subjects' quality judgments than does consonant price information. The hypothesis was investigated only with the samples of carpeting. The subjects rated the quality of the carpet samples before and after the risk and the information treatments. It was possible, then, to investigate if consonant prices caused more change in the ratings than dissonant prices.

A five-way multivariate analysis of variance was performed using the absolute differences between the after treatment and the pretreatment ratings of carpet samples 1 and 3 as dependent variables. The linear statistical model of this analysis is identical with that of the MANOVA analysis presented in Table 12. Table 15 summarizes the significant source effects of the analysis and Table 16 presents the means of the differences 1 and 2 for the conditions of A, R, P, and C.

SOURCE OF VARIATION	MULTIPLE F-RATIO	SIGNIFIC.	F-RATIO OF DIFFER. 1	SIGNIFIC.	F-RATIO OF DIFFER. 3	SIGNIFIC.
P • A	3.07	P < 0.05	3.70	P < 0.10	3.89	P < 0.10
C • R	4.29	P < 0.025	3.73	P < 0.10	6.80	P < 0.025
C • P	1.62		3.24	P < 0.10	0.33	
A	3.14	P < 0.05	1.00		6.15	P < 0.025
R	3.05	P < 0.10	0.22		6.15	P < 0.025
P	4.59	P < 0.025	8.99	P < 0.005	1.46	
C	25.94	P < 0.001	35.16	P < 0.001	29.22	P < 0.001
D.F.	2;111		1;112		1;112	

Table 15

Five-way Multivariate Analysis of Variance of the Absolute Differences Between Posttreatment and Pretreatment Quality Ratings for Carpets Ranked First and Last in the Pretreatment Rating

Treatment	Carpet 1			Carpet 3		
	Condition of Treat.		Differ.	Condition of Treat.		Differ.
	(1)	(2)	(2)-(1)	(1)	(2)	(2)-(1)
A (1=similar)	1.36	1.12	-0.24	1.73	1.12	-0.61
R (1=low)	1.20	1.29	0.09	1.13	1.73	0.60
P (1=consonant)	0.55	1.94	1.39	0.77	2.09	1.32
C (1=consonant)	0.89	1.60	0.71	1.28	1.58	0.30

Table 16

The Means of the Absolute Differences Between Posttreatment and Pretreatment Quality Ratings for Carpets 1 and 3 for the Four Treatments A, R, P, and C

Table 15 indicates that consonant and dissonant price information and Consumer Reports information had significantly differing effects on the subjects' quality perceptions. Price treatment was significant only for carpet 3, $P < 0.05$. At the same time Consumer Reports treatment was significant beyond the $P < 0.001$ level for both carpet 1 and 3.[57] These results mean that either consonant or dissonant information changed the subjects' ratings more. The means of the absolute differences between the posttreatment and pretreatment ratings show that dissonant information consistently changed the ratings more than did consonant information. Therefore, hypothesis 5 is rejected and should be replaced with a hypothesis that dissonant product information has more effect on consumers' quality perceptions than consonant information.

The directions of the changes between the post- and pretreatment ratings were as expected for the dissonant treatment conditions: the rating of carpet 3 improved and the rating of carpet 1 decreased. A consonant price treatment, however, caused an average decrease of 0.45 in the ratings of carpet 1, and a consonant Consumer Reports treatment decreased the ratings of carpet 1 by 0.08. This

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[57] It should be noted that significance levels of $P < 0.05$ or even higher should be taken with caution because the dependent variables here measure change in an attitude as a function of the treatments. For a discussion of the likely upward bias in the confidence levels of change or gain variables see Lee J. Cronbach and Lita Furby, "How We Should Measure 'Change'- or Should We", Psychological Bulletin, 74 (July 1970), pp. 68 - 80.

unexpected finding is probably due to a problem in using the discrete rating scales. If a subject rated the carpet 1 as "7" on the scale she could not change her rating for the better even if both Consumer Reports and price treatment were consonant. A subject who behaved against expectations, i.e., who decreased her rating in spite of information that confirmed her judgment, therefore, had a dominant effect on the average.

In summary, the results showed that hypothesis 5 should be rejected. The subjects followed the cue given by dissonant price information and dissonant Consumer Reports information more readily than consonant information.

Summary of Results

In conclusion, the results of this 2 • 2 • 2 • 2 • 2 factorial experiment supported the following hypotheses:

1. Price is a cue of quality but a weaker cue than Consumer Reports quality ratings.
2. Price is relied on more as a cue of quality in situations where the products are similar than when they are different.
4. A high level of perceived risk is conducive to reliance on price as a cue of quality.

The results did not support the following hypotheses:

3. Price will have more effect on the quality perception in a product that is difficult to

evaluate than in a product that is easy to evaluate.

5. Consonant price information is more effective in changing the consumers' quality perceptions than dissonant price information.

Concerning hypothesis 5 it was found that the reverse prevailed. Dissonant price information had more effect on the subjects' quality ratings than consonant price information.

CHAPTER VI

DISCUSSION

The purpose of this chapter is to analyze the findings presented in Chapter V in more detail; to relate the findings to previous research on the price-quality relationship; to discuss the limitations of this study; and, to suggest possible topics for future research on the price-quality relationship.

It should be pointed out that even low significances in the analyses of the posttreatment ratings, i.e. $P < 0.10$, will be considered as indicative of a relationship. The reason for this position is that each hypothesis was based on accepted theoretical concepts and previous empirical results. Consequently, a hypothesis is accepted at the 0.10 level provided, of course, that the magnitudes of the mean ratings and other such analyses gave results that were prescribed by the hypothesis and the theoretical analysis.

The Effect of Price Information on Perceived Quality

There is no doubt that the results of this study confirmed the possibility of the existence of a relationship between price and perceived quality. The price treatment was significant for both the product sample that was ranked first in quality prior to the treatment, and for the sample that was ranked last (Table 12). The relationship found was positive. A high price communicated an impression of high quality and a low price was used as a cue of poor quality.

This finding contradicts the results of most earlier multicue studies on the price-quality relationship. Of the several studies shown in Figure 2 only that by Enis and Stafford reports significant positive relationships between price and quality,[58] while others found price to influence quality perceptions little or not at all.[59]

The discrepancy between the findings of this study and the results of the earlier multicue studies might be caused by the difference in the experimental techniques that were used. Specifically, this study was the first one to arrange the information treatments into consonant and dissonant conditions. A treatment of this kind is claimed more accurate

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[58] Enis and Stafford, "Consumers' ....", and, "The Price-Quality ....".

[59] Gardner, "An Experimental ....", found a price-quality relationship with a low significance for men's shirts but not for toothpaste or men's suits. Neither Jacoby et al., "Price, Brand Name, ...", nor Rao, "The Salience of ....", report a significant relationship between price and perceived quality.

in its measurement of a possible price-quality relationship, than a treatment which does not control the relationships between product inspection information and explicit information.

Tables 8 and 11 show that the price treatment did not significantly influence the quality that the subjects perceived in towel 1 and in carpet 1. This finding, together with the negative research results of earlier studies suggests that price may not be a strong universal cue of quality after all. A prevailing price-quality relationship, therefore, may be easily lost into the experimental error in an empirical measurement.

The experimental approach used in the earlier studies was to analyze the ratings of each product separately without controlling the price treatment to be either consonant or dissonant with the subjects' pretreatment quality judgment. If this technique is to retain its accuracy it is necessary that consonant and dissonant price messages (and other product related messages) affect subjects' quality perceptions with equal influence. Otherwise the measured effect of a price treatment would be dependent on the order in which the subjects would rank the product samples in the

absence of price information.[60]

It was shown above that a dissonant price treatment has much more influence on subjects' perceptions of quality than a consonant price treatment (Tables 15 and 16). Consequently, the measurements of the earlier studies may lose in accuracy as their data is affected by the uncontrolled relationship between product inspection information and price information. It is, therefore, possible that this study found price-quality relationships which would not have been detected with the techniques used in the earlier studies.

The price treatment was not significant for towel 1 and carpet 3.[61] At the same time the Consumer Reports treatment influenced the ratings of all product samples, often with

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[60] Suppose that consonant and dissonant prices make the subject to change her quality rating by 0.6 and 2.0 units, respectively, on a seven point scale. (These figures are close to the actual numbers presented in Table 16.) If the subject rates product R = 6 (=best), a price treatment R < < < would change her rating by 0.6 to 6.6. This effect would probably lead the analyst to the conclusion that price has no effect on perceived quality. But, if the subject had rated R = 2 (=last), her rating would change by 2.0 units to 4.0, which would show up in an analysis of variance as a significant effect.

Thus, the strength of a price-quality relationship that is found depends on the order into which the subjects (would) rank the product samples prior to receiving the information treatments. Most previous research use identical product samples which, in the above example, would make the mean difference of the treatment conditions to 1.3, half of the 2.6 which is realized when the information treatments are controlled to be either consonant or dissonant.

[61] This result serves as a reminder that the consonant and dissonant treatments of this study were not causing the subject to respond "automatically".

higher levels of significance than the price treatment. The differences between the mean ratings of consonant and dissonant conditions also were larger for the Consumer Reports treatment than for the price treatment (Table 13). From these results one can venture the interpretation that price is a less effective cue of quality than is the Consumer Reports information. This interpretation is in line with previous research findings.[62]

A subsequent analysis was made to investigate how consonant and dissonant prices (and Consumer Reports ratings) changed the quality ratings that the subjects had made prior to receiving these treatments. A hypothesis that was developed from Festinger's theory of cognitive dissonance predicted that the subjects will utilize information from a source more when the message is consonant with their pre-treatment product evaluation than when the information is dissonant with their judgment.[63] This hypothesis was flatly rejected by the results. Both the dissonant price treatment and the dissonant Consumer Reports treatment caused significantly more change, $P < 0.05$ or lower, in the subjects' quality ratings of carpet 1 than did their consonant counterparts (Tables 13 and 15). The same applied to carpet sample 3 with respect to the Consumer Reports treat-

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[62] Rao, ibid., for example, arrives at this very conclusion though his analysis showed that price will exercise hardly any effect on perceived quality; and Gardner, ibid., found price to be a weaker index of quality than brand name.

[63] Leon Festinger, 1964, ibid.

ment, while consonant and dissonant prices caused changes of about the same magnitude.

This finding could be explained with the concepts used in experimental research on selective exposure conducted by Freedman and his associates.[64] Their findings suggest that a message that is perceived more useful is always preferred to a message that is less useful, regardless of the message's actually being consonant or dissonant. A dissonant message was probably more useful to the subject in the present experiment because it warned her that the carpet which she thought was the best in quality was the cheapest or was rated as poor by the Consumer Reports magazine. The consonant information only told her something that she already knew: the carpet that she had rated best in quality was the best.

To the extent that the above findings can be generalized outside this experiment, they imply that price is an important variable in the marketing mix. Positive price - quality relationships were shown to exist, which may make it possible to raise a product's price without incurring a loss in volume. The results also point out that a producer should be more wary of lowering the price of his product if

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[64] J.L. Freedman, "Confidence, Utility, and Selective Exposure to Information: A Partial Replication", Journal of Personality and Social Psychology, 2 (October 1965), pp. 778-780; and J.L. Freedman and D.O. Sears, "Selective Exposure", in Leonard Berkowitz (ed.), Advances in Experimental Social Psychology, Vol. 2, (New York, Academic Press, 1965), pp. 57-59.

it is considered as the best one on the market by his present and potential customers.

Effect of the Amount and Type of Product Inspection Information on Price Reliance

The effect of the amount of product inspection information on price reliance was studied with two hypotheses. Hypothesis 2 predicted that when a product has close substitutes, price information and Consumer Reports information will have more influence on the quality perceived in it than if the alternative products were perceived to be different. This hypothesis was supported only for sample 3 and for carpet 3, for both of which the P • A effect was significant beyond the $P < 0.10$ level (Tables 11 and 12). Although the significance levels were rather low the magnitudes of the mean ratings in the cells were clearly as was expected, which speaks in favor of accepting the hypothesis (Figure 10).

An equally weak but more complicated result was observed for sample 1 and for carpet 1, for both of which the P • R • A effect was significant beyond the $P < 0.10$ level. Analyses of the mean quality ratings for the eight cells of the interaction showed that the price treatment influenced the quality of the similar carpet 1 more than that of the different carpet 1 only when the level of perceived risk was low. The hypothesis 2 thus was confirmed only for the condition of low perceived risk for sample 1 and carpet 1.

Hypothesis 3 stated that price reliance increases with the increase in perceived difficulty in evaluating a product. Table 7 shows that the subjects considered towels easier to evaluate than carpeting, while Table 12 shows no significant Price • Product effect. Taken together, these results mean that hypothesis 3 should be rejected, regardless of the finding that the subjects felt significantly more confident with their judgment of towels' quality than of carpets' quality.

It was mentioned above that this conclusion contradicts the results obtained by Lambert. Besides, Gardner's experiment confirmed that the level of price reliance can vary by products.[65] It appears unlikely, therefore, that the interactive Price • Product effect should not be significant.

It might be possible that the interviewing procedure used in this experiment caused the finding. The subjects rated the quality of towels always before that of carpeting. If the subjects learned a pattern of responding to the rating questions, and if they used the pattern for their judgments of carpeting there would not be a difference between the levels of price reliance for the two products.

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[65] Gardner, ibid., p. 243.

If there were a pattern, however, it is difficult to explain why the effect of the Consumer Reports treatment was significant for sample 1 (Table 12). Figure 14 shows that Consumer Reports information had more effect on the ratings of towel 1 than on carpet 1, exactly as prescribed by hypothesis 3. The more likely and more counter-intuitive explanation of the results, therefore, is that the effect of price information on perceived quality does not vary as a function of difficulty in judging a product's quality, or at least varies noticeably less than the effect of Consumer Reports information.

The Effect of Perceived Risk on Price Reliance

The most striking findings of this study were those that were concerned with the effect of perceived risk on the price-quality relationship. Shapiro reported correlations around or below 0.20 between various indices of risk perceived in a product and the level of price reliance.[66] This study defined the level of risk in terms of the purchase situation, i.e.,in terms of the purpose for which the product was being evaluated. The results of the analyses indicate that risk, defined in this way, was a most influential factor in the process of quality perception.

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[66] Shapiro, "Price, ...".

The general hypothesis was that the consumer will pay more attention to explicit information cues, such as prices and Consumer Reports ratings in a situation of high perceived risk. The results support this hypothesis for both information treatments used in this experiment. P • R is significant beyond the $P < 0.05$ level and C • R beyond the $P < 0.10$ level for product sample 1, while neither of these interactions had a significant effect on the quality ratings of sample 3 (Table 12). Analyses of the mean ratings of sample 1 in the four cells of each significant interaction, presented in Figures 14 and 15 showed that the high risk condition indeed was conducive to increased information utilization.

Separate analyses of the towel and carpet samples' ratings indicated that P • R was significant for towel 1, $P < 0.025$, and C • R for carpet 1, $P < 0.05$. These findings can be interpreted as resulting from the roleplaying situations that were used to create the risk treatments. For towels, the risk treatment varied the level of psychosocial risk.[67] A high risk condition involved a role-playing "purchase as a wedding present". It is conceivable that the amount of psychosocial risk in this situation is so

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[67] The concepts of perceived psychosocial risk and perceived purchase risk are explained in Scott M. Cunningham, "The Major Dimensions of Perceived Risk", in Donald F. Cox, Risk Taking and Information Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967), pp. 82 - 108.

high that a consumer would buy only the best, and preferably also the most expensive product. If this is true, price cues would have a pronounced effect on the quality rating of the towel that was ranked first by the subject prior to the price treatment. This interpretation is compatible with the results. The P • R effect is significant only for towel 1.

For carpeting, the risk treatment varied the level of product performance risk. The high risk condition was described as, "purchasing carpeting for stairs and adjoining entryroom". The objective of a consumer in this situation might be to avoid carpeting that would not last long enough, rather than getting a carpet which is socially impressive, or one that will last forever. Consequently, the subjects would pay more attention to the samples of carpeting which they ranked second and, especially, last after having inspected the samples. This interpretation is in line with the results. The effect of Consumer Reports information was significant only for carpet sample 3.

A natural corollary of the above explanations is that price information and Consumer Reports information are utilized for different purposes in the process of quality judgment. Price is used more as a cue of quality than Consumer Reports information when there is a higher need for conspicuous consumption, while Consumer Reports ratings have more weight when the evaluation centers on the dimension of durability. This points out again (see Chapter III) the need for accurate definitions of what is meant with the word

quality and how is it measured.

The three-way interaction C • P • R affected the quality ratings of both samples 1 and 3 at high levels of significance (Table 12). This interaction influenced the subjects' quality ratings of carpet samples 1 and 3, $P < 0.025$ and $P < 0.10$ respectively, but not the ratings of the towels.

The above interpretation of the two-way interactions P • R and C • P has to be recalled for explaining the C • P • R effect. First, the three-way interaction measures effects on the ratings of carpet 1 and carpet 3 over and above the two-way interactions and the main effects. The lower level effects are removed before the significance of the C • P • R interaction is calculated.[68] Second, it was also explained that the price information was not used as a cue of quality in carpeting because price alone does not necessarily connote durability. The following analysis is concerned with the combined effect of price information and Consumer Reports information on quality ratings in the two conditions of risk.

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[68] The standard nominal contrasts used in the variance analyses provide this property because of the dichotomous treatments.

Figures 16 and 18 show clearly that in the condition of low risk price treatment had only a small effect on the quality ratings of carpet 1 and carpet 3. This effect was about the same for both conditions of the Consumer Reports treatment. In the high risk situation, though, price was utilized as a cue of quality when both price treatment and the Consumer Reports treatment were dissonant. That is to say that the subjects neglected price as a cue of the carpets' quality as long as a dissonant price was not teamed with a dissonant Consumer Reports rating in the high risk situation. In that case the price information apparently was taken as an index of the durability of the carpets.

In summary, the results showed that perceived risk is a major situational component that strongly affects the consumers' selection and utilization of price information for their quality judgment.

Conclusions

Besides testing the set of hypotheses concerning the effect of price information on perceived quality this study intended to bring some order to the current confusion regarding the existence of price - quality relationships. Two reasons for the contradictions in the past research results have already been discussed. First, it was proposed that subjects in an experiment should not receive different amounts of information if the objective is to analyze the effect of price on quality judgments. Second, it was

suggested that some accuracy in the measurements of the past studies was lost when the price treatment was not controlled with respect to the product inspection information.

Most previous studies on the price-quality relationship set out to investigate with simple experiments whether price is used as a cue of quality. This approach implicitly assumes that the relationship is invariant over all possible judgment situations. This study concentrated on answering the question: "When is price used as a cue of quality?" The "when" was analyzed with two factors, evaluation situation and the content of the price message. The results show clearly that the price-quality relationship is a complex relationship which can not be generalized without several intervening variables.

First, although the main effect of price on the quality ratings was significant in the analysis of the complete data, price did not affect the ratings of all product samples. The interactive effects between price and the situational treatments, therefore, should be consulted to gain a better understanding of the generalizability of the price-quality relationship. A most consistent finding was that the level of perceived risk mediated the price-quality relationship. This finding may or may not resolve some of the contradictions between earlier findings, depending on the assumption one makes about the level of risk that the subjects of the earlier experiments perceived. In any case, this result shows that the relationship is tied to the need

that the consumer intends to satisfy with the product he is evaluating. Consequently, generalization of the relationship is difficult because it is not easy to classify consumers' needs.

The effect of the second situational treatment, products' similarity, on price reliance has implications for pricing policy. The interactive effect of this treatment and price treatment was not confirmed at a high level of significance. Tables 15 and 16 showed, however, that the subjects changed their opinion of the similar products more easily, and price caused more change in the similar products' ratings. (Average absolute change due to the effect of price was 0.22 for the similar products and 1.5 for the dissonant products.) If the hypothesis that price reliance is higher for similar products is believed, the strength of the price-quality relationship depends also on the competitive market situation of each product.

Third, it was found that dissonant price messages had more effect on the subjects' quality perceptions than consonant prices. This finding has direct implications for a pricing situation where the majority of potential customers rank available products in the same order. For example, if a product is ranked first and priced highest, a price decrease may substantially alter consumers' perception of quality in the product.

In conclusion, the findings of this study point out that the price-quality relationship is more complex than has been accounted for in past research. Situational factors and contents of the price messages with respect to other product information mediate the role of price in the perceptual process of quality evaluation.

Limitations

As with all experimental research, certain limitations are inherent in this study. The use of the experimental technique itself is a limitation. The results that were found can not necessarily be projected to real world environments. More information cues and product samples would be needed to close the gap between the environment of this experiment and the real world. The number of product samples, especially may have affected the results in an unknown way. Taylor, for example, reports findings which show that as the number of items involved in a decision increases the consumer becomes less sensitive to changes in these items.[69] The effect of a price cue on the quality perceived in a product may thus depend on the number of products that are present in the evaluative situation.

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[69] Lee K. Anderson, James R. Taylor, and Robert J. Holloway, "The Consumer and His Alternatives: An Experimental Approach", Journal of Marketing Research, 3 (February 1966), pp. 62 - 67.

The techniques used to collect the data were also limited to an extent. First, the sample of subjects is a convenience sample which is not representative of a larger population. Second, the the interviewing environment was not constant because interviews were made in several places. Care was taken though to minimize changes in the environment which could affect the results. Third, the information treatments were administered by giving the subjects price lists and Consumer Reports rating lists. This approach may have caused an overestimation of the effects of price on quality. Finally, the data collection instrument is admittedly crude. Particularly problematic is the question of the rating scales, which may reflect very poorly the subjects' perceptions of the products.

It is to be remembered that this study was exploratory in nature, designed to analyze the price-quality relationship in an experimental setting. This objective was achieved. Many of the limitations noted above offer opportunities for future research, in which the relationship would be analyzed with more accuracy.

Future Research

Data collected in this experiment are already being analyzed for continuation research. The basic question in this research is: How do consumers select and utilize consonant and dissonant information cues for their quality judgments? The research is closely related to the present

study but tends to concentrate more on the confirmation of the principle of selective exposure in the context of product evaluation.

The findings of this study point out that further research on the price-quality relationship could be profitably conducted on three fronts. First, an extended analysis, designed to establish the effect of situational factors which influence the price-quality relationship would offer further insights into the process of quality perception. Second, empirical studies of the relationship to date have adopted the black box approach, in which information is fed to the process of quality judgment and the results are analyzed. It would be more constructive (and more difficult) to try to find out what is inside the black box, i.e., to develop models of quality perception. Finally, the awkwardness of the quality rating scales suggests that a non-metric approach could be used in analyzing the relationship. The non-metric techniques would not require the use of the rating scales but would require only that the subjects make ordered relations between the products under analysis.

CHAPTER VII

SUMMARY

The purpose of this study was to analyze empirically the role of price in perception of product quality. A model of the process of quality perception was developed, and various factors pertaining to this model were analyzed theoretically. This led to investigation of four general research questions:

1. Do consumers use price as a cue of quality?

2. Does the relationship between price information and perceived quality vary in different purchase situations?

3. How strong a cue of quality is price in comparison with other explicit product information?

4. Do prices which differ in their message content with respect to quality judgment that the consumer makes by inspecting available products have different effects on his quality perception.

A 2 • 2 • 2 • 2 random factorial design was utilized in the experiment. Data were collected for three product samples with this design. Two of the treatments were concerned with the situation in which the quality judgment takes place. Treatment A varied the degree of similarity between presented product samples, and treatment R varied the level of perceived risk in the purpose for which the products were evaluated. The other two were information treatments which presented the subjects with price information (treatment P) and Consumer Reports product ratings (treatment C) that were either consonant or dissonant with their pretreatment quality judgments. The experiment was conducted with 128 local area housewives as subjects.

Five hypotheses were tested with the following results:

1. There is a positive relationship between price and perceived product quality. This relationship is weaker than that between Consumer Reports rating information and perceived quality.

This hypothesis was supported by the analysis of the complete data with the full design; but, separate analyses of the product samples showed that price information did not influence the subjects' quality ratings of all samples.

2. The price-quality relationship is stronger in situations where the available product alternatives are perceived to be similar than when they

are perceived to be different.

The results supported this hypothesis only partially. It was rejected for the product sample that the subjects ranked first on the basis of product inspection information alone, but was not rejected for the product ranked last.

3. Price is used more as a cue of quality of products that are difficult to evaluate than of products that are easy to evaluate.

Although the theoretical structure which led to this hypothesis was accepted after analyses, the hypothesis was rejected.

4. A high level of perceived risk is conducive to price reliance.

This hypothesis was supported by the analyses. High risk increased price reliance. It also increased the combined effect of price and Consumer Reports information on quality perceptions, and the combined effect of price and the degree of similarity between product samples on rated quality.

5. Consonant price information affects quality perceptions more than dissonant price information.

This hypothesis was studied only for one of the products, and it was rejected. It was found that dissonant information affected the subjects' perceptions of quality more that consonant information.

In addition to the testing of the hypotheses, several findings can be drawn from the analyses of this study. First, the relationship between price (and Consumer Reports rating information) an perceived quality is not a universal relationship that would hold over all situations. Rather, it is very likely that the degree of price reliance varies from one evaluative situation to another. This experiment confirmed that two situational factors, product similarity and perceived risk, decisively mediated the strength of the price-quality relationship. Second, the study indicated that some experimental techniques that have been widely used in research on the price-quality relationship are not well suited for analyzing the relationship. Two of these techniques were the use of discrete rating scales, and price treatments that were not controlled with respect to subjects' product evaluation on the basis of product inspection alone.

APPENDIX A

PILOT TESTS

Selection of Product Samples

Towels

The selection of towel samples was made from a dozen of bath towels of that were purchased. All towels were of the same color, and of the approximately same shade and size. In the first phase, sets of three similar towels, or three different towels were picked out of the dozen. These sets were shown to several housewives, after the brand labels had been removed. Two of these sets were selected for a pilot test:

Condition A1: Similar Towels

Code	Brand Name	Purchase Price
K	St.Mary's A	$2.67
L	J.C. Penney's MH	$2.97
M	St.Mary's A	$2.67

Condition A2: Different Towels

Code	Brand Name	Purchase Price
K	St.Mary's A	$2.67
L	Cannon Monticello	$3.27
M	St.Mary's B	$1.81

In the pilot tests twenty one female subjects ranked the quality of the three similar towels followingly:

Rank of Towels	Number of Subjects
L > K > M	6
L > M > K	3
L > K = M	5
K > M > L	1
M > K > L	3
K = M > L	2
K > L > M	1

It appears that the subjects were not able to differentiate the quality of the similar towels but ranked them randomly. These three towels were used in the experiment. Many of the subjects of the pilot test appraised the quality of the identical towels, K and M, equal. This happened because many of them had also participated in the preliminary pilot tests, and were aware of the fact that some towels actually were identical.

Twenty of the twenty one subjects ranked the quality of the different towels L > K > M and one subject ranked them K > L > M. The subjects, thus, were able to differentiate the quality of these product samples well. These three samples were, consequently, used in the experiment.

Carpeting

The selection of carpet samples was more difficult than the selection of towels. Twenty nine green show-case patches of discontinued carpet lines were first purchased from local stores. Fifteen of them were selected for further work using similarity in te shade of color and type of weaving as selection criteria. Sets of three were again formed and presented to female subjects for ranking. The results concerning the similar sets were consistent: the subjects could not differentiate the carpets, and ranked them randomly.

The subjects also ranked quite randomly sets of carpets which were markedly different in their physical characteristics. Therefore, the fifteen patches were all presented to 18 subjects, who were asked to sort them into three piles of five carpets: low quality --- medium quality --- high quality. The results were as follows:

Label Used for the Carpet	Number of Subjects Who Rated the Carpet Sample To Be Of		
	Low Quality	Medium Quality	High Quality
K08	14	4	0
K19	4	5	9
K23	6	12	0
K31	4	7	7
K37	2	2	14
K71	4	9	5
K85	0	6	12
L17	1	11	6
L18	0	2	16
L24	4	7	7
L53	2	10	6
L89	2	10	6
L95	5	2	11
N28	0	7	11
N78	3	9	4

It is apparent that the subjects did not differentiate the quality of the carpets too well. Five carpets were, nevertheless, singled out for the experiment:

Condition A1: Similar Carpets

Code	Brand Name
L17	Karastan Beau Chateau
L53	Karastan Braveau
L17	Karastan Beau Chateau

Condition A2: Different Carpets

Code	Brand Name
L18	Karastan Domineau
K08	Ultimate
L53	Karastan Braveau

Carpets L17 and L53 were selected, rather than carpets K23 and L89, because of the almost identical coloring of the Karastan-brand carpets L17, L18 and L53. The selected carpets are all plush carpets. The Beau Chateau and the Domineau are all-wool wowen carpets. The Braveau is not wowen and is made of acrylic material. The Ultimate is made of nylon with a glued-on backing. The two sets of carpets were used in the experiment, regardless of the fact that the subject could not rank their quality in a consistent manner. Carpets were to represent a product, whose quality is difficult to judge, and the pilot tests showed that they indeed are difficult to evaluate.

Tests of the Risk Conditions

Preliminary discussions wiht a group of women had indicated that purchasing towels as a wedding present was considered much riskier than purchasing towels for the family. The responses of these women were consistent enough so that no formal pilot test was conducted to see which of the conditions was riskier.

For carpeting it was hypothesized that the level of perceived risk would wary as a function of the room of the house for which the carpeting was intended. To test this the following four questions were presented to 14 females, all secretaries at the University of Michigan School of Business:

1. How risky is purchasing carpeting for a family room?

   Not at all risky :---:---:---:---:---: Highly risky

2. .... for stairs and adjoining entryway?
3. .... for a child's bedroom?
4. .... for living room?

Two of the fourteen subjects were not included in the analysis of this data as they did not seem to understand the questions. The data of he remaining 12 subjects yielded the following table:

	Not at all risky 1	2	3	4	Highly risky 5
Family room	2	0	2	5	3
Stairs & adj. entry	0	1	0	4	7
Child's bedroom	2	7	2	1	0

On the basis of this table the two role playing situations were described to the subjects of the experiment in the following way:

> Low risk: "Assume that you are purchasing carpeting for a child's bedroom".
> High risk: "Assume that you are purchasing carpeting for stairs and adjoining entryway".

Judging from the data of the table these descriptions are sufficient for creating the risk conditions of this study.

APPENDIX B

THE QUESTIONNAIRE

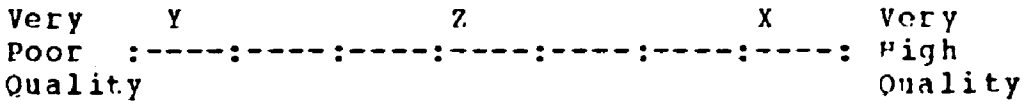
Product Evaluation Survey

The sponsors of the survey wish to take this opportunity to thank you for your willingness to participate in this study. As you may have been informed when contacted by your group representative, you will receive $2.50 for participating in this study. This money will be given either to you, or to your organization, depending upon your agreement with your group representative.

The purpose of this survey is to learn more about how consumers evaluate and select different products. Through a better understanding of purchasing problems, the sponsors hope to improve service to you, the consumer, by providing better goods and services.

INSTRUCTIONS

You will be given a questionnaire, and you will be asked to evaluate several products on a scale. This evaluation is done by placing lettered arrows on appropriate positions on the scale. For example, if you were presented three products X, Y, and Z, and you considered X to be of very high quality, Z to be of medium quality, and Y to be of very low quality, you would place three arrows as below:



To familiarize you with the task of evaluating products, the interviewer will present you three towels made by three U.S. manufacturers. Please inspect the towels, and indicate which of them you consider highest and lowest in quality based upon this preliminary evaluation

The towel highest in quality is: K L M (circle one)

The towel lowest in quality is:: K L M

Below you will be shown some Consumer Reports magazine's test information. As you may know, Consumer Reports is a consumer funded organization which tests and evaluates various products and publishes the tests in a monthly magazine. The interviewer will show you a recents copy of the Consumer Reports magazine. The magazine usually rates the quality of each product on the following scale:

Poor - to fair quality

Pair - to - good quality

Good - to - very good quality

Very good - to - excellent quality

PURCHASING TOWELS AS A WEDDING PRESENT

The interviewer will now show you the Consumer Reports' ratings of the three towels, and their prices in a store in Ann Arbor.

Assume that you are in a store trying to decide which of these three towels to buy as a wedding present.[70] Please inspect each towel carefully before answering the following questions.

1. Rate the quality of each towel at this point by placing three lettered arrows on the scale below:

Very Poor Quality	:----:----:----:----:----:----:----:	Very High Quality

2. How confident are you in your quality judgments above?

Very confident	:----:----:----:----:----:	Not at all confident

PURCHASING CARPETING

The interviewer will show you three pieces of wall-to-wall carpeting which are made by three U.S. Manufacturers. Please inspect the pieces and rate the quality of the three carpets based upon this preliminary evaluation:

---

[70] The words "as a wedding present" were replaced by "for the family" in the condition of low perceived risk.

Very Poor Quality	:	:	:	:	:	:	: Very High Quality

3. Have you ever been actively involved in shopping for wall-to-wall carpeting?

___ Yes
___ No

4. How difficult is it to judge the quality of a carpet?

Very difficult	:	:	:	:	:	: Very easy

5. How difficult is it to judge the quality of a towel?

Very difficult	:	:	:	:	:	: Very easy

The interviewer will now show you manufacturers' suggested retail prices of the three carpets, as well as their quality ratings as given in a recent issue of the Consumer Reports magazine.

Assume that you are purchasing carpeting for stairs and adjoining entryway.[71] Please inspect the three pieces of carpeting, the prices and the Consumer Reports' ratings before answering the following questions. While the color of these pieces varies only slightly, assume that you would get each of these carpets in the color you want for the stairs and adjoining entryway.

6. Rate the quality of each of the carpets by placing

---

[71] In the condition of low perceived risk the underlined words were replaced by "a child's bedroom".

three lettered arrows on the scale below.

```
Very                                          Very
Poor  :----:----:----:----:----:----:----:    High
Quality                                       Quality
```

7. How confident are you in the quality judgments about carpets you made above?

```
Very                                    Not at all
confident :----:----:----:----:----:    confident
```

Now we would like to as you some qestions about you and your household.

8. How many adults (20 years or older are there in your Household? _____

9. How many teen-agers (13 - 19 years old) are there in your Household? _____

10. How many children (0 - 12 years old) are there in your Household? _____

11. How many years of school have you completed?

___ Less than 11 grades
___ High school graduate
___ 1 - 3 years of college
___ College graduate
___ Graduate degree

12. Your age group is

___ 18 - 25 years
___ 26 - 35 years
___ 36 - 45 years
___ 46 - 55 years
___ Over 55 years

APPENDIX C

DEMOGRAPHIC PROFILE OF THE SAMPLE

The questionnaire (Appendix B) originally had nine questions about demographic characteristics. Three of these questions dealt with the subject's income and the type of housing she lived in. Many subjects of a pilot test were offended by these questions, or did not understand why they were asked. Therefore they were dropped.

The following data were gathered from the questionnaire.

1. Number of Adults (20 years or older) in the Household

Number of Adults	Number of Subjects Reporting	Percent of Sample
1	15	11.8
2	103	81.1
3	8	6.3
4	1	0.8
Total	127	100.0 %

2. Number of Teenagers (13 - 19 years old) in the Household

Number of Teens	Number of Subjects Reporting	Percent of Sample
0	78	71.6
1	22	20.2
2	8	7.3
3	1	0.9
Total	109	100.0 %

3. Number of Children (0 - 12 years) in the Household

Number of Children	Number of Subjects Reporting	Percent of Sample
0	41	37.0
1	39	35.1
2	29	26.1
3	2	1.8
Total	111	100.0 %

4. Respondent's Education

Education Level	Number of Subjects Reporting	Percent of Sample
Less than 11 gr.	2	1.6
High school grad.	58	45.3
1-3 years college	31	24.2
College graduate	25	19.5
Graduate degree	12	9.4
Total	128	100.0 %

5. Respondent's Age

Age	Number of Subjects Reporting	Percent of Sample
18 - 25 years	14	12.0
26 - 35 years	41	35.0
36 - 45 years	26	22.2
46 - 55 years	22	18.8
Over 55 years	14	12.0
Total	117	100.0 %

APPENDIX D

THE LINEAR STATISTICAL MODEL

Two linear statistical models were used in this study. The five-treatment model was analyzed with multiple dependent variable analysis of variance using the quality of the product samples 1 and 2 as dependent variables. The linear model behind this analysis is:

$$PQ = \underline{PQ} + C + P + R + A + T$$
$$+ C \cdot P + C \cdot R + C \cdot A + C \cdot T + P \cdot R +$$
$$P \cdot A + P \cdot T + R \cdot A + R \cdot T + A \cdot T +$$
$$C \cdot P \cdot R + C \cdot P \cdot A + C \cdot P \cdot T + C \cdot R \cdot A +$$
$$C \cdot R \cdot T + C \cdot A \cdot T + P \cdot R \cdot A + P \cdot R \cdot T +$$
$$P \cdot A \cdot T + R \cdot A \cdot T +$$
$$C \cdot P \cdot R \cdot A + C \cdot P \cdot R \cdot T + C \cdot P \cdot A \cdot T +$$
$$C \cdot R \cdot A \cdot T + P \cdot R \cdot A \cdot T +$$
$$C \cdot P \cdot R \cdot A \cdot T + E$$

where:

PQ = The quality perceived (rated) in a product sample

$\underline{PQ}$ = The grand mean

A = The treatment which varies the degree of similarity between the product samples that are presented to the subjects.

R = The treatment which varies the degree of risk in the purpose for which the product is evaluated, i.e. the degree of perceived risk.

P = The treatment which varies the prices of the product samples to be either consonant or dissonant with each subject's pretreatment ranking of the samples.

C = The treatment which varies the <u>Consumer Reports</u> quality ratings of the product samples to be either consonant

or dissonant with the subject's pretreatment ranking of the samples.

T = The two products, towels and carpeting.

E = The error term.

The statistical design of the four-way analyses that are presented in Tables 6 - 9 is similar to that above, with the exception that none of the terms containing the effect of the two products, i.e. the term T are present.

The variance analyses that were made had only dichotomous treatments. It was, therefore, sufficient to use nominal contrasts. In consequence, the effects of the terms are all calculated with a standard $\pm$ 1 source effect matrix.

APPENDIX E

RESULTS OF THE VARIANCE ANALYSES

The table below represents the MANOVA analyses of the two products rated first and last prior to the treatments. The significant source effects of this analysis have been presented as Table 12 in Chapter V.

SOURCE EFFECT	MULTIPLE F-RATIO	F-RATIO OF PRODUCT SAMPLE 1	F-RATIO OF PRODUCT SAMPLE 3
C • P • R • A • T	0.41	0.67	0.02
P • R • A • T	0.83	1.17	0.98
C • R • A • T	0.21	0.22	0.32
C • P • A • T	0.28	0.00	0.50
C • P • R • T	0.36	0.68	0.18
C • P • R • A	0.92	1.58	0.72
R • A • T	1.02	2.04	0.18
P • A • T	0.50	0.99	0.18
P • R • T	1.20	1.81	1.28
P • R • A	1.76	3.47	0.08
C • A • T	0.08	0.15	0.00
C • R • T	1.42	2.04	1.62
C • R • A	0.09	0.02	0.19
C • P • T	0.40	0.68	0.32
C • P • A	0.91	1.37	0.98
C • P • R	4.29	6.99	3.92
A • T	1.42	1.17	2.42
R • T	0.34	0.05	0.69
R • A	2.64	5.27	0.72
P • T	1.41	1.58	0.50
P • A	1.85	1.17	3.38
P • R	2.50	4.88	0.98
C • T	4.00	7.93	1.28
C • A	0.79	1.58	0.00
C • R	1.89	2.86	2.00
C • P	0.95	1.17	1.28
Product (=T)	2.63	2.85	3.92
Similarity (=A)	3.09	1.17	3.38
Risk (=R)	0.64	0.15	1.28
Price (=P)	6.43	10.56	5.78
Cons.Rep. (=C)	24.84	32.21	32.00
Grand Mean	3023.50	3801.12	784.07

The following table presents the analysis of variance of the product sample 2.

SOURCE EFFECT	SUM OF SQUARES	F-RATIO	SIGNIFICANCE
ANCVA ERROR	449.75		
C • P • R • A • T	0.56	0.28	
P • R • A • T	3.51	1.75	
C • R • A • T	2.24	1.12	
C • P • A • T	0.25	0.12	
C • P • R • T	2.24	1.12	
C • P • R • A	1.26	0.63	
R • A • T	4.52	2.25	
P • A • T	0.39	0.19	
P • R • T	0.14	0.07	
P • R • A	0.06	0.03	
C • A • T	0.06	0.03	
C • R • T	0.56	0.28	
C • R • A	0.39	0.19	
C • P • T	1.56	0.78	
C • P • A	0.01	0.01	
C • P • R	0.76	0.38	
A • T	3.51	1.75	
R • T	0.39	0.19	
R • A	0.56	0.28	
P • T	8.27	4.12	$P < 0.05$
P • A	0.00	0.00	
P • R	2.25	1.12	
C • T	2.25	1.12	
C • A	0.01	0.00	
C • R	2.64	1.32	
C • P	0.01	0.01	
Product (=T)	11.39	5.67	$P < 0.05$
Similarity (=A)	4.00	1.99	
Risk (=R)	0.24	0.12	
Price (=P)	1.56	0.78	
Cons.Rep. (=C)	3.51	1.75	
Grand Mean	4865.00		

The following table presents the MANOVA of the changes between the posttreatment and pretreatment ratings of carpet samples 1 and 3.

SOURCE EFFECT	MULTIPLE F-RATIO	F-RATIO OF PRODUCT SAMPLE 1	F-RATIO OF PRODUCT SAMPLE 3
C • P • R • A	0.98	1.95	0.20
P • R • A	1.44	2.34	1.16
C • R • A	0.84	0.21	1.16
C • P • A	0.33	0.54	0.03
C • P • R	1.66	2.34	1.78
R • A	0.05	0.11	0.00
P • A	3.07	3.70	3.89
P • R	0.13	0.10	0.11
C • A	0.74	1.28	0.03
C • R	4.29	3.73	6.80
C • P	1.61	3.24	0.33
Similarity (=A)	3.14	1.00	6.15
Risk (=R)	3.05	0.22	6.15
Price (=P)	4.59	8.99	1.46
Cons.Rep. (=C)	25.94	35.16	29.22
Grand Mean	135.42	112.21	135.42

BIBLIOGRAPHY

Books

Alchian, Armen A. and William R. Allen, University Economics, (Belmont, Cal.: Wadsworth Publishing Co., 1965).

Brehm, J.W. and A.R. Cohen, Explorations in Cognitive Dissonance, (New York: Wiley, 1962).

Cox, Donald F. (ed.), Risk Taking and Information Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967).

Dean, Joel, Managerial Economics, (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1951).

Festinger, Leon, A Theory of Cognitive Dissonance, (Evanston, Ill.: Row, Peterson & Co., 1957).

Festinger, Leon (ed.), Conflict, Decision and Dissonance, (Stanford, Cal.: Stanford University Press, 1964).

Hansen, F., Consumer Choice Behavior - A Cognitive Theory, (New York: The Free Press, 1972).

Hirschleifer, Jack, Price Theory and Applications, (Englewood Cliffs, N.J.: Prentice-Hall, 1976).

Hollander, Myles and Douglas A. Wolfe, Nonparametric Statistical Methods, (New York: McGraw-Hill, 1973).

Hovland, C.I., I.L. Janis, and H.H. Kelley, Communication and Persuation: Psychological Studies of Opinion Change (New Haven, Conn.: Yale University Press, 1953).

Howard, John A. and Jagdish N. Sheth, The Theory of Buyer Behavior, (New York: Wiley, 1969).

Kempthorne, Oscar, The Design and Analysis of Experiments, (New York: John Wiley & Sons, Inc., 1952).

Newell, Allen and Herbert A. Simon, Human Problem Solving, (Englewood Cliffs, N.J.: Prentice-Hall, 1972).

Sherif, C.W., M. Sherif and R.E. Nebergall, Attitude and Attitude Change: The Social Judgment - Involved Approach, (Philadelphia: Saunders, 1965).

Siegel, Sidney, Nonparametric Statistics for the Behavioral Sciences, (New York: John Wiley & & Sons, 1956).

Veblen, Thorstein, The Theory of the Leisure Class, (New York: The Macmillan Company, 1899).

Articles

Anderson, Lee K., James R. Taylor and Robert J. Holloway, "The Consumer and His Alternatives: An Experimental Approach", Journal of Marketing Research, 3 (February 1966), pp. 62 - 67.

Andrews, I. Robert and Enzo R. Valenzi, "The Relationship Between Price and Blind-Rated Quality for Margarines and Butters", Journal of Marketing Research, 7 (August 1970), pp. 393 - 395.

Calder, Bobby J., "Cognitive Consistency and Consumer Behavior", in Harold H. Kassarjian and Thomas S. Robertson (eds.), Perspectives in Consumer Behavior, Revised Edition, (Glenview, Ill.: Scott, Foresman and Co., 1973), pp. 247 - 263.

Canon, Lance K., "Self-Confidence and Selective Exposure", in Leon Festinger (ed.), Conflict, Decision and Dissonance, (Stanford, Cal.: Stanford University Press, 1964), pp. 83 - 95.

Cronbach, Lee J. and Lita Furby, "How We Should Measure 'Change' - or Should We?", Psychological Bulletin, (July 1970), pp. 68 - 80.

Cunningham, Scott M., "The Major Dimensions of Perceived Risk", in Donald F. Cox (ed.), Risk Taking and Information Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967), pp. 82 - 108.

Cunningham, Scott M., "Perceived Risk as a Factor in Informal Consumer Communication", in Donald F. Cox (ed.), Risk Taking and Information Handling in Consumer Behavior, (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967), pp. 265 - 288.

Enis, Ben M. and James E. Stafford, "Consumers' Perception of Product Quality as a Function of Various Informational Inputs", Proceedings of the 1969 Fall Conference, American Marketing Association, (Cincinnati, Ohio, 1969), pp. 340 - 344.

Enis, Ben M. and James E. Stafford, "The Price - Quality Relationship: An Extension", Journal of Marketing Research, 6 (November 1969), pp. 256 - 258.

Feather, N.T., "A Structural Balance Approach to the Analysis of Communication Effects", in Leonard Berkowitz (ed.), Advances in Experimental Social Psychology, Vol. 3 (New York: Academic Press, 1967).

Feather, N.T., "An Expectancy Value Model of Information Seeking Behavior", Psychological Review, 74 (September 1967), pp. 342 - 360.

Gabor, A. and C.W.J. Granger, "Price as an Indicator of Quality: Report on an Enquiry", Economica, New Series 33, No. 129 (February 1966), pp. 43 70.

Gardner, David M., "An Experimental Investigation of the Price - Quality Relationship", Journal of Retailing, 46 (Fall 1970), pp. 25 - 41.

Gardner, David M., "Is There a Generalized Price - Quality Relationship?", Journal of Marketing Research, 8 (May 1971), pp. 241 - 243.

Green, Paul E., "Consumer Use of Information", in Joseph W. Newman (ed.), On Knowing the Consumer, (New York: Wiley, 1966).

Hawkins, Edward E., "Price Policies and Theory", Journal of Marketing, 18 (January 1954), pp. 233 - 240.

Holloway, Robert J., "An Experiment on Consumer Dissonance", Journal of Marketing, 31 (January 1967), pp. 39 - 43.

Irwin, F.W. and W.A.S. Smith, "Value, Cost and Information as Determiners of Decision", Journal of Experimental Psychology, 54 (September 1957), pp. 229 - 232.

Jacoby, Jacob, Jerry C. Olson and Rafael A. Haddock, "Price, Brand Name, and Product Composition Characteristics as Determinants of Perceived Quality", Journal of Applied Psychology, 55 (December 1971), pp. 570 - 579.

Janis, Irving L., "Motivational Factors in the Resolution of Decisional Conflict", in Marshall R. Jones (ed.), Nebraska Symposium on Motivation, Vol. 7, (Lincoln. Neb.: Nebraska University Press, 1959), pp. 198 - 231.

Kamen, Joseph and Robert Toman, "Psychophysics of Prices", Journal of Marketing Research, 7 (February 1970), pp. 27 - 35.

Kamen, Joseph and Robert Toman, "Psychophysics of Prices: A Reaffirmation", Journal of Marketing Research, 8 (May 1971), pp.252 - 257.

Lambert, Zarrell V., "Product Perception: An Important Variable in Price Strategy", Journal of Marketing, 34 (October 1970), pp. 68 - 76.

Lanzetta, John T., "Information Acquisition in Decision Making", in O.J. Harvey (ed.), Motivation and Social Interaction, (New York: Ronald Press, 1963), pp. 239 - 265.

Leavitt, Harold J., "A Note on Some Experimental Findings About the Meanings of Price", Journal of Business, (July 1954), pp. 205 - 210.

Leibenstein, H., "Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand", Quartely Journal of Economics, 64 (May 1950), pp. 183 - 207.

McConnell, J. Douglas, "The Price - Quality Relationship in an Experimental Setting", Journal of Marketing Research, 5 (August 1968), pp. 300 - 303.

McConnell, J. Douglas, "Effects of Pricing on Perception of Product Quality", Journal of Applied Psychology, 52 (August 1968), pp. 313 - 314.

McConnell, J. Douglas, "An Experimental Examination of the Price - Quality Relationship", Journal of Business, 41 (October 1968), pp. 439 - 444.

Monroe, Kent B. and M. Venkatesan, "The Concept of Price Limits and Psyhophysical Measurement: A Laboratory Experiment", Proceedings of the 1969 Fall Conference, American Marketing Association (Cincinnati, Ohio, 1969), pp. 345 - 351.

Monroe, Kent B., "Measuring Price Tresholds by Psychophysics and Latitudes of Acceptance", Journal of Marketing Research, 8 (November 1971), pp. 460 - 464.

Monroe, Kent B., "Buyer's Subjective Perceptions of Price", Journal of Marketing Research, 10 (February 1973), pp. 70 - 80.

Morlock, H., "The Effect of Outcome Desirability on Information Required for Decision", Behavioral Science, 12 (July 1967) pp. 296 - 300.

Rao, Vithala R., "Salience of Price in the Perception of Product Quality: A Multidimensional Approach", Proceedings of the 1971 Fall Conference, American Marketing Association, 1971, pp. 571 -577.

Scitovszky, Tibor, "Some Consequences of the Habit of Judging Quality by Price", The Review of Economic Studies, 12 (2), No. 32, 1944-45, pp. 100-105.

Shapiro, Benson P., "The Psychology of Pricing", Harvard Business Review, 46 (July - August 1968), pp. 14 - 25, 160.

Shapiro, Benson P., "Price Reliance: Existence and Sources", Journal of Marketing Research, 10 (August 1973), pp. 286 - 294.

Sieber, Joan E. and John T. Lanzetta, "Conflict and Conceptual Structure as Determinants of Decision Making Behavior", Journal of Personality, (December 1964), pp. 622 - 641.

Stapel, Jan, "'Fair' or 'Psychological' Pricing", Journal of Marketing Research, 9 (February 1972), pp. 109 - 110.

Tull, D.S., R.A. Boring and M.H. Gonsior, "A Note on the Relationship of Price and Imputed Quality", Journal of Business, (April 1964), pp. 186 - 191.

Valenzi Enzo R. and I. Robert Andrews, "Effect of Price Information on Product Quality Ratings", Journal of Applied Psychology, 55 (February 1971), pp. 87 - 91.

Whittaker, James O., "Resolution of the Communication Discrepancy Issue in Attitude Change", in C.W. Sherif and M. Sherif (eds.), Attitude, Ego - Involvement and Change, (New York: Wiley 1967), pp. 159 - 177.

Zajonc, Robert B., "Cognitive Theories of Social Behavior", in Gardner Lindsey and Elliott Aronson (eds.), Handbook of Social Psychology, Vol. 1, (New York: Addison Wesley, 1967), pp. 320 - 411.

Other

Rao, Vithala R., The Salience of Price in the Perception and Evaluation of Product Quality: a Multidimensional Model and Experimental Test. Unpublished Doctoral Dissertation, University of Pennsylvania, 1970.

Shapiro, Benson P., Price as a Communicator of Quality An Experiment. Unpublished Doctoral Dissertation, Harvard University, 1971.