

## **MARKETING RESEARCH: A STATE-OF-THE-ART REVIEW AND DIRECTIONS FOR THE TWENTY-FIRST CENTURY**

This article provides observations on the state of the art in *marketing* research during 1987-1997. As such, it updates the earlier state-of-the-art review by Malhotra (1988), which won the Journal of the Academy of *Marketing* Science (JAMS) Best Article Award. The primary thrust of articles published in the Journal of *Marketing* Research during 1987-1997 is reviewed to determine important areas of research. In each of these areas, the authors summarize recent developments, highlight the state of the art, offer some critical observations, and identify directions for future research. They present a cross-classification of various techniques and subject areas, and make some observations on the applications of these techniques to address specific substantive and methodological issues in *marketing* research. The article concludes with some general directions for *marketing* research in the twenty-first century.

*Marketing* research is broadly concerned with the application of theories, problem-solving methods, and techniques to the identification and solution of problems in *marketing* (Malhotra 1996). The focus of *marketing* research has been on the philosophical, conceptual, substantive, and technical problems of research in *marketing*. Since the time of our last review (Malhotra 1988), significant progress has been made. The purpose of this article is to summarize the current state of the art by reviewing the primary thrust of articles published in the Journal of *Marketing* Research (JMR) during 1987-1997. We also present a cross-classification of various techniques and problem areas and make observations on the application of these techniques to address substantive and methodological issues in *marketing* research. Finally, we discuss some directions *marketing* research should take as we move into the next century.

### **PRIMARY THRUST OF JMR ARTICLES**

The primary thrust of JMR articles published during 1987-1997 is summarized in Table 1. This table was compiled from the annotated subject indices published in the November issues. The subject categories used are those employed by JMR. It can be seen from Table 1 that the popular areas of inquiry include *advertising* and media research; *brand* evaluation and choice; buyer and consumer behavior; channels of distribution; new product research; pricing research; salesforce research; *strategy* and planning; measurement and scaling methods; and statistical methods including econometric models, regression, and other statistical techniques. The level of calibration for models ranged from the individual (micro) to the *market* (macro). In between these end points on the calibration continuum were intermediate-level model types, such as latent class (where subgroups are nested) and hybrid-type models, such as Bayesian (where individuals are nested). For each subject area, the purpose is to summarize recent developments, to highlight the state of the art, to offer some critical observations, and to identify directions for future research.

### **ADVERTISING AND MEDIA RESEARCH**

Malhotra (1988) discussed three streams of research regarding *advertising* and media: (1) attitude toward the *brand*, (2) the *advertising*-sales relationship, and (3) media exposure. The first was assessed at the micro (individual) level, while the second and third streams of research were evaluated at the macro (*market*) level. The major accomplishments in *advertising* and media research during the period of this review could be described as measuring the previously unmeasurable effects of promotion. Such measurement success has occurred at the micro level of the individual's feeling or subconscious processing, as well as at the macro level of the *market's* response. Application of technological advances, such as moment-to-moment affect

measurement, and split-cable TV copy tests matched with single-source scanner data, have led to promising measurement triumphs in recent years at both the micro and macro levels.

### **Micro-Level Phenomena**

Researchers have moved beyond investigating controlled, cognitive processing. Recognition (e.g., Cradit, Tashchian, and Hofacker 1994; Singh, Rothschild, and Churchill 1988) and subconscious processing effort (e.g., Allen and Janiszewski 1989; Janiszewski 1990) have received concerted research. Affect or feelings has also attracted much research interest (e.g., Baumgartner, Sujan, and Padgett 1997; Burke and Edell 1989; Derbaix 1995; Stayman and Batra 1991).

With increased TV viewing for households, research of print ad readership scores led to a focus on recognition of TV commercials. Recognition scores for TV commercials not only covary with unaided recall scores but are more sensitive and more discriminating (Singh et al. 1988). For researchers using signal detection theory (SDT) methods in recognition studies, there are decisional biases of (1) yea-saying/nay-saying when respondents are presented with single ads and (2) interval bias when two ads are presented at a time. Confidence ratings are recommended, as opposed to yes/no recognition responses (Cradit et al. 1994).

Research focused on subconscious processing has shed more light on the lower threshold of mental effort used by consumers in contemporary settings. Experiments regarding respondents' awareness of a contingency between a conditioned and unconditioned stimulus suggest that a contingency awareness (involving some cognitive processing) may be a requirement for successful attitude conditioning (Allen and Janiszewski 1989). From the hemispheric processing theory perspective, interference in processing may be the result of nonattended material competing for subconscious resources (Janiszewski 1990). Such interference may be the result of nonattended material competing for subconscious resources.

It is important to distinguish between attitude (an evaluative judgment) and affect (a valenced feeling state) (Cohen and Areni 1991). Researchers of affect have always faced daunting measurement challenges for the fleeting and ephemeral effects of the mood and feelings of consumers. Feelings scales have been developed to measure response to TV commercials (Burke and Edell 1989). Subsequently, feelings constructs were used in a structural equations model of attitude toward the *brand* ( $A_{\text{sub } b}$ ). In addition to influencing attitude toward the *advertisement* ( $A_{\text{sub } ad}$ ), feelings were found to influence judgments of the ad's characteristics, *brand* attribute evaluations, and attitude toward the *brand*.

Recent innovations in methods of research of feelings have emphasized natural settings, or technology. Affective reaction for TV commercials can be measured in a natural setting by coding facial expressions of viewers. While the facial expressions appeared to have no effect on  $A_{\text{sub } ad}$  or  $A_{\text{sub } b}$ , verbal measures like those used in previous research of feelings did indicate a relationship between feelings and these attitude constructs (Derbaix 1995). This approach deserves to be replicated so researchers can improve such less-intrusive methods and provide evidence on their psychometric properties.

Regrettably, integrating technology-based advancements in measurement to natural settings remains elusive. However, technology advances have occurred in settings that are not completely natural. Some of these advances have been applied in the measurement of affect. Relying on participants to move a computer mouse during the play of commercials, a computer "feelings monitor" can be used to record bipolar, moment-to-moment affect measurements to understand consumer preference for the structure of TV commercials (Baumgartner et al. 1997). For TV

commercials that elicit positive feelings, findings suggested consumers prefer commercials with high peaks that end on a strong positive note and that exhibit sharp increases in the trend of affective experiences over time.

No doubt, technology advances will continue to improve the capabilities of *advertising* researchers in the years to come. The challenge for such researchers will be to use such technologies more frequently in natural settings and in less-intrusive ways. Such approaches must also be balanced by respect for individuals' privacy.

### **Macro-Level Phenomena**

When measuring behaviors, not mental processing, technology-based innovations have allowed minimal intrusiveness and extremely valuable perspectives of consumer and firm behavior regarding *advertising* and couponing. Results of more than 400 BEHAVIORSCAN studies suggest increased sales are not related in simple terms to increased TV *advertising* weight (spending). However, new *brands*, smaller *brands*, line extensions, and *brands* in growing product categories do seem to be responsive to increased *advertising* weight. In addition, copy *strategy* changes or proportional allocation of more weight to the front or back end of a media plan both interact with increased TV *advertising* weight and appear to result in sales gains. Finally, trade display activity appears to be able to blunt TV *advertising*'s ability to positively affect sales (Lodish et al. 1995; Risky 1997). Future studies should investigate the relationship between sales and *brand* equity indices, cross-elasticity effects of *advertising* on nonadvertised competitive *brands*, the effects of *advertising* on *brand* price elasticity, and the relative impact of *advertising* on socioeconomic or demographic segments.

Media exposure models have advanced during the period of this review. The log-linear approach has been used to model exposure distribution (numbers of individuals in the population seeing none, one, two, or all the ads in a campaign). This approach was found to be superior to either the multinomial Dirichlet or the beta-binomial model (Danaher 1991). The computational demands of this log-linear approach can be overcome by a refinement to achieve faster computation times and higher accuracy.

In addition to data from magazine studies, Information Resources, Inc. (IRI) single-source data for *advertising* have been used to evaluate a nonparametric approach to modeling household-level television *advertising* exposure. Similar to the negative binomial distribution model, this approach includes managerial input of gross rating points (GRPs) for each day part and week of the campaign (Abe 1997). The household-level exposure model accounted for audience accumulation of day part combinations, which holds considerable managerial importance in media planning.

*Marketing* researchers have remained silent on the major methodological issue in media research of recent years--the accuracy of ratings for television program viewing. Natural-setting research at the macro level confronts similar challenges in evaluating the audience for *advertising* (e.g., What fractional part of a complete exposure constitutes a "viewing"?). We call on *marketing* researchers to further improve techniques for audience evaluation and to share both the strengths and shortcomings of current methods. Validity of research is a scientific issue and should remain as apolitical as possible.

### **BRAND EVALUATION AND CHOICE**

This rich stream of research is reviewed with a focus on (1) consideration set, (2) *brand* management issues of extensions and equity, (3) *brand* image and positioning, and (4) *brand* choice and switching.

## Consideration Set

The theoretical and empirical aspects of the consideration set have attracted considerable attention since 1986. Reviews on this topic are provided by Roberts (1989), Roberts and Lattin (1997), and Shocker, Ben-Akiva, Boccara, and Nedungadi (1991). Most of the studies are based on the cost-benefit approach to consideration (i.e., whether a **brand** is good enough to be considered). Several studies have used scanner data to investigate consideration sets in packaged goods (e.g., Andrews and Srinivasan 1995; Bronnenberg and Vanhonacker 1996; Siddarth, Bucklin, and Morrison 1995). The probability of consideration has been modeled as a function of **brand** loyalty and **marketing**-mix variables, such as promotion. However, **marketing**-mix variables differentially affect consideration (salience) and choice (preference). The results of these studies suggest that the predictive ability of choice models can be improved by having a two-stage approach including the consideration set stage.

While there is general agreement about the usefulness of adding a consideration set stage of modeling to improve the fit and prediction of choice models, several issues remain to be resolved. First, it is not clear whether the same utility function is appropriate at both the consideration and choice stages. There is also a need to understand how consumers form consideration sets in terms of similarities and dissimilarities of **brand**. Specifically, does similarity of the attribute set or similarity of utilities influence which **brands** are included in the consideration set? Perceptually similar **brands** could affect choice through the trade-off contrasts, and boundary **brands** could have an effect through extremeness aversion (Simonson and Tversky 1992). Second, the formation of and changes in consideration sets due to **marketing** efforts also deserve more attention. In addition to the cost-benefit approach to consideration, another important aspect that is in need of research is **brand** retrieval; there is little work on whether the determinants of **brand** salience (top-of-mind recall) are the same as those for cost-benefit consideration (Hutchinson, Raman, and Mantrala 1994).

Furthermore, there are data and design issues to be addressed. Studies relying exclusively on scanner data to examine consideration sets are limited in several ways, including the difficulty of observing the purchases of **brands** with low purchase probabilities, given that a limited number of purchase occasions are examined. These limitations can be substantially overcome by combining scanner data with tracking surveys. Within-subject longitudinal experiments complemented with between-subjects designs seem appropriate for examining changes in consideration sets due to new **brand** entries and other **marketing** efforts. Such designs capitalize on the strengths of within-subjects experiments (detecting change at the individual level) while counterbalancing their weaknesses (demand artifacts and testing effects) (Lehmann and Pan 1994).

Methodologically, various models and techniques have been introduced to capture consideration. For example, multidimensional scaling (Jedidi, Kohli, and DeSarbo 1996) and stochastic multidimensional unfolding (DeSarbo, Young, and Rangaswamy 1997) have been advocated to represent consideration set membership. By using these approaches, it is possible to segment the **market** on the basis of antecedents of consideration sets and predict the probability of consideration set membership for each product in each segment. Also, various two-stage models have been proposed. The two stages can be conceptualized as consisting of **brand** choice and quantity choice and a tobit-type procedure can be used for estimation (Tellis 1988). A two-stage price expectations model of customer **brand** choice has been proposed in which the first stage is an assessment of how expected prices are formed. In the second stage, **brand** choice is modeled

in terms of the *brand's* retail price and whether or not that price compares favorably with the *brand's* expected price (Kalwani, Yim, Rinne, and Sugita 1990). Alternatively, a threshold model of expectations was proposed that can be formulated incorporating the reference effects of price and promotion (Lattin and Bucklin 1989). The two-stage paradigm is further extended in hierarchical models. A significant problem in the estimation of these models has been the prior specification of the tree form (Currim, Meyer, and Le 1988). Despite the modeling advancements, our concerns, such as utility specification for each decision process stage, still apply to these models. Future research is needed to rectify the conceptual and substantive issues with those of the methodological specifications.

### **Brand Management: Extensions and Equity**

A special issue (May 1994) was devoted to *brand* management, highlighting the importance of this area, especially with respect to a *brand's* equity and extendibility. Specifically, a review of recent studies reveals that two factors influence consumer perceptions of a *brand* extension: (1) *brand* affect and (2) the similarity between the original and extension product categories. From the similarity perspective, *brand* extension evaluations are influenced by the extension's similarity to the *brand's* current products (*brand* extension typicality) and by variation among the *brand's* current products (*brand* breadth) (Boush and Loken 1991). The evaluations of a proposed extension when there are intervening extensions differ from evaluations when there are no intervening extensions. This occurs in the case of a significant disparity between the perceived quality of the intervening extension (as judged by its success or failure) and the perceived quality of the core *brand* (Keller and Aaker 1992). Also, the relative similarity of intervening extensions has little differential impact, but having multiple intervening extensions has different effects than having a single intervening extension. As *brand* portfolio quality variance decreases, there is a positive relationship between number of products affiliated with a *brand* and consumers' confidence in their extension evaluations (Dacin and Smith 1994).

From the affect perspective, *brand*-specific associations may dominate the effects of *brand* affect and category similarity, particularly when consumer knowledge of the *brands* is high (Broniarczyk and Alba 1994). Combining two *brands* with complementary attribute levels, a composite *brand* extension appears to have a better attribute profile than a direct extension of the header *brand*. Such a *brand* combination has a better attribute profile when it consists of two complementary *brands* than when it consists of two highly favorable but not complementary *brands* (Park, Jun, and Shocker 1996).

Both perspectives strive to uncover those consumer-based, or micro-level, factors that will help a *brand* extension succeed in the marketplace. Regarding the *market*- or macro-level determinants of line extension success, six appear salient. These six are (1) parent *brand* strength, (2) parent *brand* symbolic value, (3) early entry timing, (4) a firm's size, (5) distinctive *marketing* competencies, and (6) the *advertising* support allocated to line extensions. Even with cannibalization, the incremental sales generated by the extension seem to be reason enough to make a line-extension *strategy* viable (Reddy, Holak, and Bhat 1994).

Most of the *brand* extension studies involved laboratory experiments (e.g., Boush and Loken 1991; Broniarczyk and Alba 1994; Dacin and Smith 1994; Keller and Aaker 1992), with the processes underlying the evaluations of *brand* extensions being studied by examining response times and verbal protocols. The exclusive reliance on laboratory experiments to study *brand* extensions (characteristic of many studies) has inherent limitations because such studies lack external validity. Dacin and Smith (1994) demonstrate that the need for multiple methods as a

positive relationship between the number of products affiliated with a *brand* and consumers' evaluations of extension quality was found in the experiment but not in the survey. Nevertheless, these experiments allow us to examine *brand* management issues from the individual consumer, not just the *brand* (e.g., *market* share or *brand* sales). This micro-level or disaggregate perspective accommodates consumer heterogeneity, which is becoming more important to the understanding of a *brand*'s success. Thus, to maintain this consumer-level viewpoint, surveys provide a complementary approach to the laboratory experiments. A survey-based method can be useful for measuring and understanding a *brand*'s equity in a product category and evaluating the equity of the *brand*'s extension into a different but related product category (Park and Srinivasan 1994).

Future *brand* management research should focus on further refinement and measurement of the *brand* equity construct. As researchers and practitioners strive to assess the strategic importance of *brand* equity, their progress may be impeded without a unified definition, and thus externally valid construct. A generally accepted measure can further the overall understanding of the strategic role *brand* equity plays in not only extending the *brand* but also financially benefiting the firm. In addition, this role can then be assessed consistently at both a domestic and an international level.

### **Brand Image and Positioning**

A worthy goal of every *marketing* manager is to differentiate the *brand* and thus shield it from future price competition. Schema research indicates that perceptions of a *brand* being strongly discrepant within the category result in a subtyped or niche position for the *brand*. However, perceptions of a *brand* being only moderately discrepant result in a differentiated position within the general category (Sujan and Bettman 1989). Price elasticities represent a measure of differentiation. By providing unique and positive messages, a firm can insulate itself from future price competition, as witnessed by less-negative future price elasticities. Conversely, nonunique messages can decrease future differentiation. For example, price promotions for firms that price above the industry average lead to more negative future price elasticities (Boulding, Lee, and Staelin 1994). It may even be possible to achieve "meaningless differentiation" (i.e., differentiation on an attribute that is irrelevant to creating a *brand* benefit but can produce a meaningfully differentiated *brand*). However, the conditions under which this can take place should be carefully delineated (Carpenter, Glazer, and Nakamoto 1994). A survey approach can be used to determine cross-price elasticities and switching matrices for *brands* in a prespecified product class. *Brand* preferences and price-preference trade-offs obtained in this way can be used to specify preference functions and estimate choice probabilities (Bucklin and Srinivasan 1991). Differentiation need not be achieved through promotional messages only. There is also support for the notion that foreign *branding*--the *strategy* of pronouncing or spelling a *brand* name in a foreign language--triggers cultural stereotypes and influences product perceptions and attitudes (LeClerc, Schmitt, and Dube 1994). A 10 country/60 region study found that cultural power distance, cultural individualism, and regional socioeconomics affect the performance of functional (problem prevention and solving), social (group membership and symbolic), and sensory (novelty, variety, and sensory gratification) *brand* image *strategies* (Roth 1995). Research on positioning, hence *brand* competition, has relied on scanner data. A vast majority of the analyses of scanner data in the literature have focused either at the household (micro) or store (macro) level to understand competition and consumers' response to the *marketing* mix. However, the analysis of competitive behavior can be enriched by combining in-depth consumer

information from a micro-level household scanner panel with comprehensive *market* data supplied by a macro-level retail-tracking panel. Such an approach offers the manager detailed information about consumers (e.g., identification of consumer segments in terms of *brand* preferences and socioeconomic characteristics) along with strategic diagnostics of the product *market* (e.g., the sensitivity of the *market* to price promotions, the impact of a *brand's strategy* on competitors, or the vulnerability of the *brand* to competitive actions) (Russell and Kamakura 1994). Likewise, the use of scanner data to estimate *brand* positioning maps is a nice complement to maps based on consumer perceptions, as such maps are based on observed choice behavior.

Developing and managing a *brand* image is an important part of a firm's *marketing* program. However, little research has been done on linking the use of *brand* image *strategies* to *market* performance of the *brand*. There is a need to develop models that also allow for the effect of economy-wide factors and a firm's return on investment (Aaker and Jacobson 1994).

Furthermore, given the importance of a *brand* image to its success and equity, we reiterate the need for future research in better understanding the equity construct.

### **Brand Choice and Switching**

Research on *brand* choice and switching behavior at the time of choice has focused on substantive issues such as variety seeking and on methodological issues of capturing consumer differences. Several authors have advanced variety-seeking explanations for *brand* switching. There is a need to distinguish between true variety-seeking behavior (i.e., intrinsically motivated) and derived varied behavior (i.e., extrinsically motivated). Variety-seeking behavior appears to be a function of the individual-difference characteristic of need for variety and product category-level characteristics that interact to determine the situations in which variety seeking is more likely to occur relative to repeat purchasing and derived varied behavior (van Trijp, Hoyer, and Inman 1996). Adequate attention has not been devoted to the long-term *market* share implications of variety-seeking behavior. The least-preferred *brand* is found generally to gain *market* share as variety seeking intensifies, whereas the most preferred *brand* tends to lose a share. If two *brands* are perceived as having become more similar without a change in overall preferences, the repositioned *brands* are likely to lose a *market* share, while uninvolved *brands* gain a share. If two *brands* are perceived as having become more similar in a way that increases overall preference for those repositioned *brands*, they should gain a *market* share, while uninvolved *brands* lose it (Feinberg, Kahn, and McAlister 1992).

Methodologically, models of purchase timing and *brand*-switching behavior incorporating purchase timing explanatory variables and unobserved heterogeneity have been formulated (Gupta 1991; Vilcassim and Jain 1991; Wedel, Kamakura, DeSarbo, and Ter Hofstede 1995). The commonly used models are exponential, Erlang-2 (no heterogeneity), and models with gamma heterogeneity. It is possible to include duration dependence, heterogeneity, and nonstationarity in the model and also to account for right-censored data. These models provide more insights into the dynamics of household purchase behavior than can be obtained from conventional discrete choice models, such as logit or probit. These models disclose the strong influence of *marketing* mix and demographic variables on *brand* switching, as well as the relative advantage for smaller *brands* in using promotions (when compared with the effect of category leaders using the same promotion to encourage *brand* switching). The complexity of *brand*-switching models can be both a challenge and a help to the researcher. The effects of

*marketing* variables can change nonproportionally over time, but these effects can be used to identify segments with different switching and repeat-buying behavior.

Contemporary choice models focus on choice opportunities in which consumers purchase a quantity of a single item in a product category. They do not recognize the possibility of assortments of multiple-item purchases, which can lead to incorrect conclusions about the impact of past purchase behavior on current choices. We need models that allow for multiple-item shopping trips and that incorporate the influence of the in-store shelf assortment available at the time of purchase, and *marketing*-mix variables on multiple-item shopping trip choices (Harlam and Lodish 1995). Most choice models in *marketing* implicitly assume that the fundamental unit of analysis is the *brand*. In practice, however, many more of the decisions occur at the level of the stock-keeping unit (SKU). There are some benefits associated with modeling consumer choice among SKUs, such as the ability to forecast sales for imitative line extensions that enter the *market* in a future period (Fader and Hardie 1996).

When proposing new choice models, it is important to compare their performance with other relevant models in the literature. This desirable practice is illustrated by Wedel et al. (1995), who show that their model predicts purchases and purchase timing in holdout data better than the models proposed previously. In estimating choice models, the issue of heterogeneity across consumers or households should be considered. If heterogeneity is present but ignored, the estimated parameters will be biased and inconsistent. In variety-seeking models, logit formulations can provide not only estimates of the parameters of individual choice but also the sampling distributions to test the statistical precision of these parameters. The combination of logit models and Markov process methodology should further our understanding of *brand*-switching behavior. We repeat Malhotra's (1988) call for more research in this direction.

Future research should focus on the effect of new and modified products on choice given the high rate of innovations introduced to the *market*. Questions such as what factors moderate the impact of new features on *brand* choice demand systematic inquiry. One of the few recent studies shows that a new feature adds greater value and increases the choice share of a *brand* more when the *brand* (1) has relatively inferior existing features, (2) is associated with lower (perceived) quality, (3) has a higher price, or (4) has both a higher price and higher quality. The addition of a new feature reduces buyers' price sensitivity for low-quality *brands* but not for high-quality *brands*. Furthermore, multiattribute diminishing sensitivity is a more important moderator of the effect of new features than is performance uncertainty (Nowlis and Simonson 1996). Uncovering the role of moderators on choice can only further our understanding of *brand* choice and *brand* success. In summary, future research in the area of *brand* evaluation and choice should address theoretical, methodological, and applied issues. Theory needs to be further developed for explaining how *brand* consideration sets are formed. More comprehensive models are needed to account for the range of influential variables in *brand* choice. Finally, research addressing *brand* image and *market* success needs to be undertaken, while more field studies are needed in *brand* extension research.

## **BUYER AND CONSUMER BEHAVIOR**

While a wide range and variety of articles have been published, we focus attention on consumer decision making and promotion and price effects.

### **Consumer Decision Making**

The processing of information to evaluate competing alternatives remains a central focus in decision-making research. Consumers' preferences are systematically affected by whether they

make direct comparisons between *brands* (e.g., a choice task) or evaluate *brands* individually (e.g., purchase likelihood ratings). In particular, "comparable" attributes, which facilitate precise and easy comparisons (e.g., price), tend to be relatively more important in comparison-based tasks. Conversely, "enriched" attributes (e.g., *brand* name), which are more difficult to compare but are often more meaningful and informative when evaluated on their own, tend to be relatively more important when preferences are formed on the basis of separate evaluations of individual options. Thus, attribute-task compatibility is a crucial determinant in evaluating alternatives. These findings generalized across preference-elicitation tasks and theoretically prescribed attributes (Nowlis and Simonson 1997). From a strategic perspective, understanding how information is processed can be used to a *brand's* advantage. The choice probability of an alternative can be enhanced by making it the focus of a comparison (the focal option) with a competing alternative. This proposition was supported in choice problems involving alternatives about which consumers have information in memory, rather than when descriptions of alternatives' features were provided (Dhar and Simonson 1992).

Nevertheless, despite years of research, our understanding of the process of decision making is still lacking. Some fundamental questions relate to how consumers seek and process information. Depth of processing is influenced by perceived efficacy and message framing. A low-efficacy condition (i.e., when it is uncertain that following the recommendations will lead to the desired outcome) motivates more in-depth processing. When individuals process information in an in-depth manner, negative frames are more persuasive than positive ones. In contrast, a high-efficacy condition generates less effortful message processing in which positive and negative frames are equally persuasive (Block and Keller 1995). There is a need to develop a theory of the evolution of choice decisions that addresses information acquisition behavior and the duration of the purchase deliberation process (Putsis and Srinivasan 1994).

As compared to the earlier review by Malhotra (1988), the emphasis on compositional models of decision making has declined in the past decade. However, the decompositional models have continued to be the subject of research. Researchers have cautioned that the external validity of either the compositional or decompositional models must be assessed to understand the attitude-behavior consistency of these models (Horowitz and Louviere 1993; Louviere and Johnson 1990). Nevertheless, insufficient attention has been devoted to this issue.

In addition, several areas warrant further investigation. The decision-making process of special populations such as the children and the elderly has received little attention. Systematic differences may exist. For example, it has been found that younger children respond differently from older children to the expansion of choice sets and that this pattern is related, in part, to age differences in children's ability to incorporate similarity judgments into the choice process (John and Lakshmi-Ratan 1992). Another area in need of attention is the role of affect in consumer decision making. Limited research that has been done shows the existence of independent dimensions of positive and negative affect. Both dimensions of affect are related to the favorability of consumer satisfaction judgments, extent of complaint behavior, and word-of-mouth transmission (Westbrook 1987). Continued investigation into the influence of these variables on the decision-making process is suggested.

### **Promotion and Price Effects**

Much promotion research has investigated the influences on coupon use/redemption behavior, as well as the effectiveness of retail and price promotions. Traditionally, it has been assumed that coupon redemptions are greatest in the period immediately following the coupon drop and

decline monotonically. However, expiration dates may induce a second mode in the redemption pattern just prior to the expiration date (Inman and McAlister 1994). This reasoning is based on regret theory (Loomes and Sugden 1982). Another extension of coupon redemption involves a model of coupon redemption by considering the joint effects of coupon attractiveness and coupon proneness on redemption that does not require explicit measurement of these variables (Bawa, Srinivasan, and Srivastava 1997). This model extends the earlier work, which found coupon redemption rates to be much higher among households that have purchased the *brand* on a regular basis in the past. However, it appears that the lower average repeat-purchase rates observed after a promotion are due to promotion temporarily attracting a disproportionate number of households with low purchase probabilities (Neslin and Shoemaker 1989).

The multiple effects of retail promotions on *brand*-loyal and *brand*-switching segments of consumers have also been studied. The findings indicate that (1) the *market* can be characterized by *brand*-loyal segments (each of which buys mostly their favorite *brand*) and switching segments (each of which switches mainly among competing *brands* of the same type), (2) promotional variables have significant effects on within-segment *market* shares, (3) store share can be explained in terms of the promotional attractiveness of a store, (4) category volume is affected by the overall promotional attractiveness of the product category with significant current and lagged effects, and (5) the lagged effects due to consumer purchase acceleration and stocking up last longer for *brand*-loyal segments than for switching segments (Grover and Srinivasan 1992). These results serve to clarify earlier findings that more than 84 percent of the sales increase due to promotion comes from *brand* switching, while purchase acceleration in time accounts for less than 14 percent, whereas stockpiling due to promotion accounted for less than 2 percent of the sales increase (Gupta 1988).

Also in this literature stream, price promotions have received attention. First, research has shown that there is heterogeneity in consumer knowledge of prices and deals. In addition, it has been found that buyers' purchase behavior can be influenced not only by the current price of a product but also by what prices they expect in the future. Both the promotion frequency and the depth of price discounts have a significant impact on price expectations (Kalwani and Yim 1992). There is a region of relative price insensitivity around the expected price, such that only price changes outside that region have a significant impact on consumer *brand* choice. As in the case of price expectations, consumer response to promotion expectations has been found to be asymmetric. Absence of a promotional deal has a larger effect in absolute terms than the presence of a promotional deal when one is not expected. Furthermore, consumer expectations of both price and promotional activities influence *brand* choice behavior. The presence of a promotional deal when one is not expected or the absence of a promotional deal when one is expected may have a significant impact on *brand* choice. The effects of a retraction of a price promotion are contingent on both the choice patterns of individuals, that is, whether or not they switch among *brands*, and the ubiquity of promotion in a product category (Kahn and Louie 1990). In addition, the consumers' response to the deal varies for preferred and less-preferred *brands*. Compared with consumers without knowledge of future deals, consumers with knowledge of future deals could be more likely to purchase on (1) low-value deals and (2) deals for less-preferred *brands*. Another implication of interest is that the relative quantity purchased by consumers who have deal knowledge compared with those who do not depends on the time pattern of deals (Krishna 1994).

From a methodological viewpoint, there is a plethora of studies in *marketing* and related journals about the relationship between price and perceived quality. A metaanalysis indicated that relationships between price and perceived quality, and between *brand* name and perceived quality, are positive and statistically significant (Rao and Monroe 1989). While price has a positive effect on perceived quality, it has a negative effect on perceived value and willingness to buy (Dodds, Monroe, and Grewal 1991). When it comes to objective relationships, consumers perceive objective price-quality relationships with only a modest degree of accuracy (Lichtenstein and Burton 1989). Moreover, the type of experimental design and the strength of the price manipulation significantly influences the observed effect of price on perceived quality, underscoring the importance of research design considerations (Rao and Monroe 1989). Future research in this area should focus not only on methodological issues but also substantive ones. Although considerable attention has been paid in the literature to the identification of factors that influence coupon use, not much work has been done to develop models that can help managers predict the different effects of price promotions in a comprehensive way. Such effects could include attracting new consumers, altering the perceived value of the product for current customers, boosting *advertising* effects, taking *market* shares from competitors (including private-label *brands*), or inducing inefficiencies in the operation of channels. We suggest these for future research.

#### **CHANNELS OF DISTRIBUTION**

Past work involved the negotiation process and studied the roles of power, influence, and conflict in the channel relationship. Investigation in these areas continues, as researchers strive to refine the constructs and the constructs' roles in channel theory. Constructs for which measures have been developed include influence *strategies* (Boyle, Dwyer, Robicheaux, and Simpson 1992). The antecedents of various negotiation *strategies* to manage conflict in the channel include the amount of time in the relationship and the importance of issue to be resolved, whereas consequences include satisfaction (Ganesan 1993). The theoretical frameworks presented to further the understanding of the channel relationship include bilateral deterrence theory as a framework to show the effect of channel member interdependence on conflict (Kumar, Scheer, and Steenkamp 1995), attribution theory (Anand 1987), political economy (Dwyer and Oh 1987), and transaction cost analysis (TCA) theory (Klein, Frazier, and Roth 1990; see Rindfleisch and Heide 1997 for a synthesis of the channels research findings in application of TCA).

Control by channel members received research attention (e.g., Agrawal and Lal 1995; Anand 1987; Stump and Heide 1996), in addition to the relationship constructs of power, influence, and conflict. More important, research explored the internal and external factors that influence the channel relationship. For example, the roles of the environment and its uncertainty (Achrol and Stem 1988; Celly and Frazier 1996; Dwyer and Oh 1987) are explored. Suppliers give authority and bureaucratic control to dealers in munificent or rich *markets* because of the dealers' increasing importance to suppliers in this environment (Dwyer and Oh 1987). Furthermore, the internal effects of scarce resources on the relationship are examined, such as time (Anderson, Lodish, and Weitz 1987). The greater the trust is between a sales agency and a principal, the more time the agency allocates to that principal (Anderson et al. 1987).

From a methodological perspective, many studies employ structural equation modeling (SEM) predominantly through LISREL (Joreskog and Sorbom 1989). Researchers use this analysis technique to assess relationships among complex channel constructs--as captured in the development of multi-item measures. Despite the conceptual merit of LISREL, Malhotra (1988)

cautions researchers as to its analytical appropriateness. As an appropriate use of SEM in the channels research area, Howell (1987) challenges and offers a respecification of a LISREL model introduced in a power study by Gaski (1986).

A major concern presented in the Malhotra (1988) review was that channels research should move beyond student simulations of channel relationships to address external validity. Most of the articles on channels of distribution reviewed for this article presented studies with samples drawn from the field, thus indicating progress. A second concern was the restricted focus on the dealer in studying dyadic relationships. Despite the concern and empirical support for looking at both sides of the relationships, most JMR articles reviewed in this time period continued to focus data collection on dealers only. Nevertheless, Anderson and Weitz (1992) present a study on commitment in distribution channels where the channel dyad served as the unit of analysis and data were collected from pairs of manufacturers and distributors. Furthermore, although nonstudent samples are now frequently used in channels research, little replication of the results across industries or channel contexts have been presented. A noted exception includes Kumar, Stern, and Achrol (1992), who employ two samples drawn from different industries to develop and validate a scale for assessing reseller performance from the supplier's perspective. In striving for external validity, it is not only important to use appropriate samples but also multiple samples for generalizability.

Future research should include longitudinal studies (how does the relationship change over time). In addition, the majority of this cross-sectional research has reflected established channel relationships (noted exception: Klein et al. 1990). It would be very interesting to see how relationships change over time especially with fledgling relationships. Finally, very little research has been conducted on the international channel (exception: Klein et al. 1990). Theoretically, international research looks well positioned to extend currently used frameworks (e.g., TCA for *market* entry *strategies*: Anderson and Coughlan 1987; Anderson and Gatignon 1986). Clearly, as the commitment to the development and operationalization of channels constructs is maintained, generating measures that apply internationally becomes increasingly important.

#### **NEW PRODUCT RESEARCH**

New product research has been conducted from both the *market* (macro) and consumer (micro) perspectives. For many of the *market*-based models, timing appears to be a key strategic theme. For example, the importance of new-product preannouncement behavior by a firm has received attention. Firms that are likely to preannounce have little or no *market* dominance in the product category, are small, and participate in "friendly" competitive environments (Eliashberg and Robertson 1988). In addition, a faster response to competitors' innovations is found in *markets* with higher growth rates (Bowman and Gatignon 1995). Furthermore, timing plays a role in gaining *market* share advantages in a fast-cycle industry (Datar, Jordan, Kekre, Rajiv, and Srinivasan 1997). A lead-time advantage has a positive effect on *market* share, but if a competitor introduces within the "lead-time threshold," the first entrant's advantage in terms of share disappears (Datar et al. 1997). Also, research presenting contrary findings about the existence of a pioneering advantage has been presented using a *market*-based perspective (e.g., Golder and Tellis 1993).

On the other hand, new-product success has been examined from a consumer basis. For example, newproduct success is influenced by price sensitivity of consumers and their willingness to pay (Cameron and James 1987). In addition, research has found that consumer expectations of new-product quality are influenced more by observed quality than *advertised* quality (Kopalle and

Lehmann 1995). With respect to model precision, several consumer-based models (e.g., Morrison's modified beta-binomial model and the linear modified intention model) have been formulated to assess predictive accuracy of trial purchase of a new product through intention measures (Jamieson and Bass 1989). Furthermore, capturing consumer heterogeneity adds precision to model estimates (Allenby and Ginter 1995; Weerahandi and Moitra 1995). To emphasize the growing interest in new-product research, a special issue was dedicated to the topic (February 1997). Several major themes presented in the issue include cycle time (e.g., how new-product-development cycle time affects firm performance), lead time/time to *market* in contributing to new-product success, globalization, organizational determinants of new-product success (e.g., organizational memory), and advancements in the modeling research and decision process techniques of new-product research. In addition, the editors provide direction for future research in new-product development (Wind and Mahajan 1997).

With respect to methodology, several different data collection and analysis methods are used in this research stream including participant observation (Workman 1993), historical analysis (Golder and Tellis 1993), metaanalysis (review of their O'Dell winner, Sultan, Farley, and Lehmann 1996), and computer laboratory (Hauser, Urban, and Weinberg 1993). A variety of estimation procedures are also incorporated, such as survival modeling for diffusion (Boker 1987; Chandrashekar and Sinha 1995), logit modeling (Hauser et al. 1993), Bayesian applications (Allenby and Ginter 1995), and dynamic latent-class structuring (Bockenholt and Dillon 1997).

While methodological advancements have been made, several substantive issues remain to be resolved. Consequently, future research should emphasize areas such as new-product ramifications on posttrial purchases (noted exception: Chandrashekar and Sinha 1995). As not all new products survive, research should focus on factors driving not only product success but also product failure (Zirger and Maidique 1990), especially from the perspective of the customer (Wind and Mahajan 1997). In addition, furthering global research on new products is important for the advancement of new product development theory. Testing the new-product development process in international contexts provides a basis for generalizability of findings and external validation of frameworks tested.

## **PRICING**

While most managers report being well-informed on their own costs and competitive prices in their industry, most report they are not well-informed on the price responsiveness of their customers (Dolan and Simon 1996). In the past, four major approaches have been used to estimate price response: (1) expert judgment, (2) customer surveys, (3) price experiments, and (4) analysis of historical *market* data. In industries with only a few customers, expert judgment has merits in estimating customer response. However, in industries with many customers, expert judgment can be misleading. Since the 1970s, indirect questioning of customers using conjoint analysis became a standard of customer surveys that focus on pricing response. During the period of this review, the most noteworthy substantive gains in pricing research have emerged using approaches of price experiments and analysis of historical *market* data.

For example, price promotion insights were obtained in a replicated, factorial experiment by using weekly data from the ordering books of three grocery stores. Deal elasticities were found to be large (in the range of 2-11). *Advertising* and a larger price discount were found to have a strong positive interaction, as elasticities increased from 20 percent to 180 percent when deals

were *advertised*. In addition, leading *brands* were found to be less sensitive to deals (Bemmaor and Mouchoux 1991).

Store-level scanner data have boosted research based on the analysis of historical *market* data. Hoch, Kim, Montgomery, and Rossi (1995) used weekly store-level scanner data for 18 product categories to estimate store-specific price elasticities for a chain of 83 supermarkets in metropolitan Chicago during 160 weeks. The results of this prodigious study suggested that price elasticities vary from store to store. Despite the inability of previous research to find much of a relationship between consumer characteristics and price sensitivity, 11 predictor variables of this study accounted for an average of 67 percent of the variation in price response for the 18 products. An intriguing finding was that consumer demographic variables (i.e., household size, education of household, expense of home and ethnicity) were more influential than competitive variables (e.g., store volume relative to competition, and distance from competition) in explaining the price sensitivity of the stores. More research of the apparent dominance of consumer characteristics over competitive variables in explaining the price sensitivity of stores is in order. Typically, retailer pricing policy currently focuses on competition in a price zone based on geographies composed of competing retailing outlets, and not consumer characteristics. Path analysis has also proved useful in analyzing historical *market* data. Substantive insights have been obtained with respect to the relationships between loss leaders, double couponing, and in-store price specials with overall store sales, profit, and traffic. Walters and MacKenzie (1988) found loss leaders' effect on store profit is indirect through increased store traffic. Specifically, the effect of double coupon promotions on store profits occurs through the increased sales of products purchased with coupons (and not through increased store traffic). Such findings challenge the conventional thinking of retailing researchers, as price promotions may not stimulate sales of nonpromoted items.

Much work remains in understanding the influence of context on price response. With the improved information technology of today's retailing environment, experiments and historical analysis of *market* data appear to offer researchers the best opportunities for making valuable gains in the future. Such experiments might include investigating the pricing response of customers in an Internet environment where competitive prices can be quickly compared. Historical analysis of *market* data collected from retailing outlets that are not grocery stores would also advance our understanding of context and price response.

### **SALESFORCE RESEARCH**

Past research has focused on sales performance (e.g., Churchill, Ford, Hartley, and Walker 1985 meta-analysis). However, recent sales force research has focused on furthering the understanding of the antecedents as well as the consequences of a salesperson's success. To summarize the outcome of performance, job satisfaction is reviewed through a meta-analysis (Brown and Peterson 1993). While performance leads to greater organizational commitment by the salesperson, no direct link was found between performance and satisfaction across the studies. On the other hand, the antecedents of performance have been analyzed from the perspective of both the individual salesperson and the salesperson's organization. More effective salespeople provide more elaborate scripts and have richer knowledge structures (Leong, Busch, and John 1989; Sujan, Sujan, and Bettman 1988). Although the number of cues stored in memory to classify clients is the same for successful and unsuccessful salespeople, those that are successful use more rigorous standards to classify clients (Szymanski and Churchill 1990).

From the perspective of the organization, organizational commitment (e.g., Johnston, Parasuraman, Futrell, and Black 1990) and organizational citizenship behavior, such as sportsmanship (Podsakoff and MacKenzie 1994), influence effectiveness. In addition, the strategic form of salesforce compensation (salary versus commission) may affect the performance of the salesperson, often in relation to quota (Chowdhury 1993; John and Weitz 1989; Ross 1991). Finally, the form of the feedback---output based or behavior based---by the salesperson's supervisor may play a role in the salesperson's effectiveness (Jaworski and Kohli 1991).

Various selling methods are also investigated. First, through adaptive selling, adaptive salespeople are more intrinsically motivated, yet the evidence is inconclusive as to their effectiveness (Spiro and Weitz 1990). With the "hard sell" technique, costs include injury to customers. Conversely, benefits include increased social welfare since the benefits to the salesperson outweigh the costs to the customer (Chu, Gerstner, and Hess 1995). Furthermore, just-in-time selling (Germain, Droge, and Daugherty 1994) positively influences specialization in the selling organization. With respect to appropriate demonstration time in a new-product sales presentation, more knowledgeable consumers need shorter demonstrations to maximize their probability of buying the product (Heiman and Muller 1996).

Malhotra (1988) raised several methodological concerns about the salesforce research in the 1980-1986 issues of JMR. First, the reliance on cross-sectional data as well as nonexperimental field data to examine causal relationships was questioned. To overcome this potential weakness, several longitudinal studies have been conducted (e.g., Johnston et al. 1990; Ryans and Weinberg 1987). Also, Ross (1991) uses computer simulations and experiments (albeit student experiments) in a four-study research effort of salesperson actions against quota levels. A second concern highlighted the lack of use of multi-item measures. Again, in an effort to develop quality multi-item measures for salesforce-related constructs, Spiro and Weitz (1990) devote their research to the development of a multi-item measure of adaptive selling (ADAPTS). Other research makes use of SEM (e.g., LISREL) to handle the study of relationships among multi-item constructs (e.g., Germain et al. 1994; Johnston et al. 1990).

Future research should give more attention to the sales team (as opposed to the salesperson) as more and more *companies* go to the team-selling approach (Moon and Gupta 1997). Also, alternative measures to sales figures as the conventional means for evaluating salesperson effectiveness or success should be pursued. These alternative measures of effectiveness could reflect the *marketing* concept or goals of relationship *marketing* through customer-oriented constructs, such as customer satisfaction, customer retention, and/or new-customer development. In addition, as research investigates the benefits of *marketing*-mix effectiveness at each stage of the decision process leading to a choice (e.g., *advertising* influences awareness; promotion influences consideration; Bronnenberg and Vanhonacker 1996), salesforce effectiveness could be studied in the same multistage manner. In these ways, a more multidimensional approach to sales success could be captured.

### **STRATEGY AND PLANNING**

Increased activity in the realm of *strategy* and planning has moved this topic of research into a state-of-the-art review for the first time. Substantive gains include a better understanding for manager behavior. Specifically, researchers have achieved insights into managers' response to new entrants in the *market*, managers' view of pioneering advantage, and managers' use of information in decision making.

Research of *strategy* and planning issues in *marketing* has historically presented measurement challenges, but valuable substantive insights have been gained in recent years by the innovative methodological approaches of researchers in this field using both secondary and primary data. Econometric and operations research techniques have profiled the powerful potential for secondary data, while lab experiments featuring games or computer simulation have demonstrated the value of alternatives to survey methodology in primary data collection. Because of the nature of organizational phenomena that cross functional lines or firm boundaries, research in *strategy* and planning has often required complex sampling even for the use of surveys. Despite these demands, the methodological triumphs in *strategy* and planning research have led to a better understanding of substantive issues related to the behavior of firms in a dynamic, competitive environment.

Econometric techniques proved useful in gauging the firm's response to new entrants. Gatignon, Anderson, and Helsen (1989) developed multistage econometric models in two industries, which gave better definition to the literature's predicted counterattack and retreat response of established firms toward new entrants. Firms "counterattack" by spending more on their most effective *marketing*-mix elements and "retreat" by reducing expenditure of their weaker *marketing*-mix elements. Similar *market*-share modeling suggested sales efforts (i.e., detailing) should be directed to new *brands* in growth *markets* because *market* share changes are more responsive to selling efforts in growing *markets* (Gatignon, Weitz, and Bansal 1990). The nonparametric Data Envelopment Analysis was employed to measure the relative efficiency of decision-making units using Profit Impact of *Market Strategy* (PIMS) data. The results suggest pioneering advantage is substantial and significant after controlling for management skill (Murthi, Srinivasan, and Kalyanaram 1996).

In counterpoint to the modeling of *market* share, evidence in both lab and field settings suggests that many decision makers prefer competitor-oriented choices based on *market* share, despite incurring lower profits with such choices (Armstrong and Collopy 1996). Taking the performance of competitors into account appeared to be an influential step in adopting the course of action leading to firm hegemony and suboptimal profits. Analysis of 20 large U.S. firms during a span of 54 years using a variety of secondary sources suggests that a moderately negative correlation characterized the relationship between competitor orientation of these firms and return on investment (ROI) (Armstrong and Collopy 1996). In sum, these results suggest firms that focus on the performance of competitors tend to have lower profits.

While long-term returns for the firm must be a focus of profit-maximizing managers, different information processing is likely to be used in environments characterized by low turbulence or high turbulence (Glazer and Weiss 1993). Using the results from an experiment conducted with a strategic *marketing* simulation game, formal planning led to an underweighting of the time sensitivity of marketplace information. The assumption of evolutionary or gradual change appeared to desensitize decision makers to the immediacy and wearing out of information. As a result, planning with a long-term horizon in a turbulent environment was less effective than not engaging in such planning. Instead of emphasizing *advertising* and *brand* introductions as planners did, successful nonplanners continually modified *brands* and maintained high budget levels for the sales force. In this way, nonplanners manifested a better appreciation for the character of the marketplace and the time sensitivity of information.

The use of *market* intelligence across functional boundaries within the firm was assessed in an ambitious, large-scale survey of senior executives of firms in the high-tech industrial equipment

field. Evidence for a "mere formality effect" was found, in that intelligence received through formal channels appeared to be used more than intelligence obtained through informal channels (Maltz and Kohli 1996).

Looking to the future, environmental change will likely be more pronounced, and organizational channels will likely become less formal (*American Marketing Association* 1998). The implication for researchers is that measurement will be even more challenging than it has been. More research is needed about manager behavior in such contexts. We agree with Keep, Hollander, and Dickinson (1998) that alternative methods of research, such as historical cases, could be particularly useful in theory development in the future. In addition to historical methods, qualitative methods of cultural anthropology, such as storytelling (Buckler and Zien 1996), or metaphor elicitation (Zaltman 1997) can offer similar advantages for the challenges faced by researchers of manager decision making.

### **SCALING AND MEASUREMENT**

The previous state-of-the-art review reported that formal construct validation was being adopted by researchers using approaches such as the multitrait-multimethod (MTMM) matrix and causal modeling (Malhotra 1988). While MTMM matrices are still only occasionally cited in the literature now (Kumar and Dillon 1990; Malhotra 1987), the use of causal modeling has proliferated during the time of this review. Baumgartner and Homburg (1996) have given several guidelines on the future use of SEMs. Researchers should use SEMs with conservatism, should obtain high degrees of measurement accuracy to obtain desired results, and should either cross-validate or replicate studies.

Using methods related to SEMs, Gerbing and Anderson (1988) incorporate exploratory factor analysis and confirmatory factor analysis for the assessment of construct unidimensionality. The method prescribed by Gerbing and Anderson (where unidimensionality for several constructs is gauged simultaneously in the estimation of a complete confirmatory factor analysis model) results in understanding the nomological validity of constructs. Netemeyer, Durvasula, and Lichtenstein (1991) extend the use of LISREL modeling in the context of cross-national research by using multigroup analysis to assess factor invariance across four cultures using the CETSCALE.

Sample complexity is not restricted to cross-national research. In the previous state-of-the-art review, Malhotra (1988) called for researchers to pursue multiple informants when studying complex units of analysis, such as organizations or organizational subunits. In developing a measure of *market* orientation in organizations, Kohli, Jaworski, and Kumar (1993) used both a large-scale single-informant sample and a multiple-informant sample to develop their 20-item MARKOR scale. Extensive use of LISREL modeling with both samples (which included blocking techniques in analyzing the multiple-informant data) was a valuable feature of this study.

Beyond measuring construct validity of multi-item scales in survey research, a theme of much of the innovative work done by researchers in the scaling and measurement domain during the time of this review concerns optimizing respondent contributions. Such optimization has been pursued through correcting for bias, or working with missing data, or avoiding respondent fatigue with more powerful experimental designs. In addition to avoiding respondent fatigue, efficient experimental designs can lower the cost of studies by avoiding unnecessary data collection. Finn and Kayande (1997) use a generalizability approach (G-theory), rather than a classical reliability theory-based approach, to design efficient measurement that explicitly accounts for differences in

the purpose of measurement. Because the G-theory method addresses the dependence of a measurement instrument's generalizability on the number and kind of conditions under which the information is collected, it is similar to meta-analysis and its estimation of the influence of inter-study differences on bivariate relationships (Farley and Lehmann 1986). While a number of studies based on G-theory (e.g., Kumar and Dillon 1990; Rust and Cooil 1994; Singh and Rhoads 1991) have appeared in the literature, the potential of this approach has not been realized. The complexity of data common to *marketing* research studies (i.e., a large number of factors, a large number of levels, and unbalanced data due to nonresponse) create estimation challenges when using G-theory. Even though some of these challenges can be overcome using special estimation techniques, advances in estimation and statistical inference methods are needed to apply G-theory more widely in *marketing* research applications.

In research of multidimensional scaling (MDS), Malhotra (1987) found MDS to be fairly robust to embedding (where a group of similar objects or rating scales is embedded in a larger set of objects). However, MDS solutions were very sensitive to changes in stimulus domain from actors to automobiles. In light of our previous discussion of G-theory where the context of measurement is considered, this finding is particularly germane. While G-theory researchers have not yet made application to MDS, Malhotra's findings suggest that deriving G-theory-based reliability measures for MDS could be beneficial to researchers. In a foretelling of what challenges might await researchers making such applications, Malhotra, Jain, and Pinson (1988) present a framework and procedures for examining the robustness of MDS configurations when the data are missing. Individual characteristics of respondents, such as cognitive integration and imagery, influenced the quality of configurations obtained with incomplete data.

Looking beyond G-theory to the realm of experimental designs, efficiency has become a major concern. In this sense, efficiency means getting the most information possible from the participating individuals, so fewer participants can be used. Computer-generated designs in both conjoint and discrete-choice experimental settings will likely lead to identifying optimal designs—particularly in terms of efficiency (Kuhfeld, Tobias, and Garratt 1994). While improving efficiency may imply using fewer respondents or asking fewer questions, the value of using multiple methods remains. Huber, Wittink, Fielder, and Miller (1993) conducted a comparison of methods for adaptive conjoint analysis (ACA) (Johnson 1987) and full-profile conjoint analysis. Combined models where either ACA or full-profile methods were preceded by self-explication tasks outperformed models based on one task alone.

Two types of response style that can be detected in many surveys can affect accuracy of response. These are (1) yea-saying/nay-saying and (2) standard deviation. A respondent's level of yea-saying can be gauged by the mean of their responses across many rating scale items, while "standard deviation" is simply the standard deviation of those responses. Using data from the DDB Needham annual survey of adults in the United States, Greenleaf (1992) developed an approach to correcting bias in standard deviation without removing the attitude information component in standard deviation. Simply normalizing data would likely suppress the attitude information component. The promise of Greenleaf's work to improve measurement in cross-national and multicultural *marketing* deserves further refinement and validation by researchers. Distortion in measurement is a concern not only for researchers using quantitative data but also for those using qualitative data. A new index of reliability,  $I_{[sub\ r]}$ , for judgment-based nominal scale data was developed and found to be more appropriate for interjudge data of *marketing* research than either the commonly observed percentage of interjudge agreement or Cohen's

Kappa (Perreault and Leigh 1989). A decision-theoretic loss function can be used to formally model the loss to the researcher of using wrong judgments and to show how this produces a new proportional reduction in loss (PRL) reliability measure (Rust and Cooil 1994). PRL generalizes many existing quantitative and qualitative measures. In addition, this framework can be used to explore several practical issues in qualitative data. Some of these issues include the following: (1) how reliable qualitative data should be, (2) how many judges are necessary given a known proportion of agreement between judges, and (3) what proportion of agreement must be obtained among a set of judges to ensure adequate reliability.

Looking to the future, we call upon researchers to use multiple methods in their studies more frequently. Better assessments of validity and generalizability will be the valuable benefit of increased use of multiple methods. Carroll and Green (1997) strike a similar theme in proposing a tandem use of MDS and conjoint analysis to move MDS from its currently near-exclusive use as an exploratory technique to one with confirmatory capabilities. Carroll and Green recommend combined use of these two methods to obtain a synergistic effect in product design studies. We look forward to increased use of such combined techniques.

## **STATISTICAL METHODS**

In reviewing the research on statistical methods, we address econometric modeling and other major techniques including regression, cluster analysis, and latent class modeling.

### **Econometric and Related Modeling**

The econometric modeling research has focused on methodological refinements and advancements to increase the informative power of models. For example, many econometric models have been introduced to capture disaggregate information from aggregate information, as the need for individual-level information is better recognized. To illustrate, choice models are developed that infer the consumer's decision process, leading to choice such as the consideration set of *brands* from choice data only (e.g., Andrews and Srinivasan 1995). Despite the conceptual benefits of disaggregation (e.g., individual-level data), researchers caution its use (Christen, Gupta, Porter, Staelin, and Wittink 1997; Gupta, Chintagunta, Kaul, and Wittink 1996). When disaggregated data are aggregated for analysis, such as a linear aggregation, aggregation bias may result because of heterogeneity among the individuals. To overcome this bias, Christen et al. (1997) introduce a debiasing technique to improve estimation.

Furthermore, researchers use econometric modeling to further our understanding of *market* structuring. Advancements in techniques include multidimensional scaling enhancements (DeSarbo and Hoffman 1987), probabilistic modeling of *brand*-switching data (Kumar and Sashi 1989), latent-segment logit modeling using aggregate data (Zenor and Srivastava 1993), and factor analytic probit modeling using panel data (Elrod and Keane 1995). Elrod and Keane's model is the first successful internal analysis of *market* structure. Here, heterogeneity and the importance of attributes are recovered by the model. By comparison, external analysis (e.g., conjoint analysis) directly presents the structure of the *market* to respondents. Also, Cooper and Inoue (1996) use consumer preferences based on switching probabilities and attribute ratings to determine *market* structures. This model allows for heterogeneity in consideration sets, on a segment-by-segment basis, as a basis for determining *market* structures.

With respect to choice modeling, much of the research looks to address the fine points of the logit model (the multinomial logit model--MNL) such as its estimation as well as its limiting assumptions. Maximum likelihood estimation was found to outperform minimum logit chi-square (weighted least squares) estimation in terms of point estimation, predictive accuracy, and

statistical inference (Bunch and Batsell 1989). Furthermore, modified MNL models have been developed to test the independence of irrelevant alternatives (IIA) assumption (Bechtel 1990; Elrod, Louviere, and Davey 1992). Also, an elimination by aspects (EBA) model for choice has been compared with the MNL (disaggregate and aggregate) (Fader and McAlister 1990). This EBA model has been extended to the dimensions (EBD) model that can handle the IIA problem encountered in MNL (Gensch and Ghose 1992). In comparing the nested logit model with the Luce model, the nested logit (1) does not rely on the assumption of simple scalability, (2) can analyze individual-level hierarchical preference structures (using paired comparison data), and (3) outperforms the Luce model (Moore and Lehmann 1989).

Bayesian estimation is also used in the *marketing* econometric models. First, this estimation procedure has been applied to store-level scanner data of choice decisions and compared with the Luce model (and other models), highlighting the benefits of Bayesian estimation (Allenby 1990). Bayesian estimation was also used to capture the correlations among demographic variables in estimating demand (Puffer, Kalyanam, and Hodges 1996) and to estimate household-level parameters for promotions (Rossi and Allenby 1993).

Econometric modeling has also been used in international research. For example, time-series analysis has been applied to estimate the primary demand for beer in the Netherlands (Franses 1991). A meta-analysis found that "country" is a moderator to the price elasticity estimation (Tellis 1988). Data from Japan indicated that high-share *brands* have significantly greater loyalty than what would be found in the Dirichlet model of purchase behavior (Fader and Schmittlein 1993). A single ideal-point model for *market* structure analysis has been used to study the gift *market* for young Japanese men (Mackay, Easley, and Zinnes 1995).

Malhotra (1988) addressed models of the *advertising*-sales relationship and causal analysis. For the *advertising*-sales relationship, there were concerns with aggregation (especially in time) as well as looking at *marketing*-mix effects (beyond *advertising*) at different levels of aggregation. Using a simulation, Srinivasan and Weir (1988) presented an alternative discrete-time approach for the recovery of micro-level parameters from "macro" data as well as an alternative "constrained search estimation" method for evaluating various discrete time models (p. 146). For causal analysis, improvements include work by Bone, Sharma, and Shimp (1989), who applied a bootstrap sampling distribution (generated from a simulation) to evaluate the overall fit indices in structural equation and confirmatory factor analysis models. This procedure helped uncover acceptable levels of fit for the fit measures provided by structural equation modeling. Bagozzi and Yi (1989) extended the use of structural equation modeling to experimental contexts. Homburg (1991) introduced a procedure to split samples when cross validating in causal analysis. *Marketing* researchers have accomplished much in the realm of structural equation modeling outside of JMR. Baumgartner and Homburg (1996) summarize many of these. Further methodological advancements can still be made with econometric models, especially in terms of generalizability. Broadening the application and scope of these models is a needed direction for future research.

Furthermore, the concern of generalizability is raised in the use of simulations. Many articles rely on Monte Carlo simulations to provide support for their conceptual frameworks (e.g., Bunch and Batsell 1989; Homburg 1991; Vanhonacker 1988). Simulations appeal to the management of internal validity (assuming the "true nature" is specified properly) and to the performance of model comparisons. However, external validity is threatened, such that findings may not be generalizable. As such, simulations should be accompanied by "real-world" applications to

mitigate the threat to external validity. Some, but not all, research has included empirical applications with the simulations to address this concern (e.g., Cooper and Inoue 1996; DeSarbo, Ramaswamy, and Chatterjee 1995; Puffer et al. 1996). Future research should accommodate both the rigor of internal validation of the models, as well as the generalizability of their use.

### **Other Statistical Methods**

In addition to econometric models, other statistical methods receiving attention in JMR during the last decade include regression, cluster analysis, and latent class modeling. Multiple regression is one of the most widely used procedures for estimating preference and *market* response models. Attention has focused on the model's assumptions and, more important, the violations of the assumptions. First, flexible regression has been shown to be a useful technique for performing a nonparametric multiple regression while relaxing several of the standard regression assumptions, namely, that of linearity, normal errors, and homoscedasticity (Rust 1988). Another method for non-parametric regression is the moving ellipsoid method (Abe 1991). This method generalizes the flexible regression technique and provides improvements in mean absolute deviations and/or regression smoothness. Another approach that can be used to implement regression-based procedures in the face of incomplete information on the dependent variable is the EM algorithm (Malhotra 1987).

Second, several concerns with multicollinearity have been raised. However, fears about the harmful effects of collinear predictors are exaggerated in situations typically encountered in cross-sectional data (Mason and Perreault 1991). A Monte Carlo simulation experiment (varying factor-scoring method, uniqueness, assumption about factor correlations, and number of variables factored) investigated the use of common factors as independent variables in regression (Lastovicka and Thamodaran 1991). Although several factor score estimators performed "equivalently," the Dwyer factor-extension technique gave the best overall results.

Regression models have also been used to estimate *market* response. Methods based on three-mode factor analysis and multivariate regression can help both researchers and managers make better decisions regarding whether Universal Product Code (UPC) bar codes should be aggregated into *brand* units when determining or predicting *market* response. A multivariate regression from the competitive-component scores provides a methodologically sound and practical method for calibrating *market* response in such cases (Cooper, Klapper, and Inoue 1996). To further address the assumption issues, equity estimation has been proposed as a superior technique for estimating *market* response functions in the presence of high predictor-variable collinearity. Wildt (1993) compared the relative performance of equity, ridge, and ordinary least squares (OLS) estimators by using simulation experiments. His findings were only partly consistent with prior research and indicated that under certain conditions, equity outperforms OLS and ridge on a number of important criteria, and equity yields coefficient estimates that assign more equal explanatory weight to correlated predictor variables than does OLS or ridge. As collinearity increases, this tendency becomes very pronounced, to the point where equity yields estimated standardized coefficients more equal in magnitude irrespective of other conditions, such as true coefficient values and model explanatory power. However, some of these findings were challenged by Rangaswamy and Krishnamurthi (1995), who maintain that under conditions of multicollinearity, the equity estimator provides estimates that are typically closer to the true parameters than the OLS and ridge estimates. More work is needed assessing the performance of various estimation procedures and devising new ones when multicollinearity is present.

Many of the statistical techniques have been applied in *market* segmentation. Fuzzy clusterwise regression procedures have been proposed that incorporate both benefit segmentation and *market* structuring within the framework of preference analysis (Wedel and Steenkamp 1991). They simultaneously estimate the models relating preferences to product dimensions within each cluster and to the degree of membership of *brands* and of subjects in the various clusters. Furthermore, K-means clustering programs are frequently used to group buyers into *market* segments based on such characteristics as psychographics, benefits seeking, and conjoint-based partworths. In addition, researchers generally use data on exogenous variables for the same respondents. Krieger and Green (1996) described the EXCLU algorithm for modifying the original K-means segmentation to enhance prediction of an exogenous variable that can be either continuous or categorical. The authors compared this approach with popular clusterwise regression models. Krieger and Green concluded that each approach has its place, depending on study objectives.

Finally, a latent-class framework can be used for *market* segmentation with categorical data on two conceptually distinct but possibly interdependent bases for segmentation (e.g., benefits sought and use of products and services). This model explicitly considers potential interdependence between the bases at the segment level by specifying the joint distribution of latent classes over the two bases, while simultaneously extracting segments on each distinct basis. The estimation of model parameters is based on an EM algorithm. This model provides an alternative to "traditional" (single-basis) latent segmentation methods (Ramaswamy, Chatterjee, and Cohen 1996).

Despite the advancements made in these techniques, more innovative statistical procedures need to be developed for addressing basic data analysis issues, such as data fusion, robust estimation, missing and messy data, and partial data obtained to reduce demands on the respondents. With respect to data fusion, the problem is how to analyze two sets of discrete variables collected in independent samples with a subset of the variables common to both samples. Kamakura and Wedel (1997) propose a statistical data-fusion model that allows for statistical tests of association by using multiple imputations. They compare the cross-tabulation results from fused data with those obtained from complete data. Innovative procedures are also needed for the visual representation of data, so that *marketing* research findings may be more clearly communicated, especially to managers (Holbrook 1997; Novak 1995).

#### **APPLICATION OF TECHNIQUES**

The application of techniques in various substantive areas is presented in Table 2. The cell counts indicate the frequency with which each technique has been used as the primary technique for investigating issues in a particular substantive area. Multiple counting was allowed in both technique and substantive areas. Counts were limited to primary applications.

By far the most popular technique has been analysis of variance (ANOVA). The majority of the applications of this technique have been in *advertising* and media research. Other areas where ANOVA has been used as a main technique are choice and consumer behavior. ANOVA was also one of the most popular techniques in the previous review (Malhotra 1988). Certain problems in *advertising*, consumer behavior, and choice can best be investigated in an experimental setting, making ANOVA a natural technique for analyzing the resultant data. The relative popularity of logit has increased since the last review. Logit models are well suited for analyzing choice data and have seen the most applications in this area. Recent advances to overcome the IIA assumption have further increased the appeal of logit models.

SEMs remain popular. Most of the applications have been in measurement where this technique can be used to assess unidimensionality and obtain evidence of construct validity. However, it has also seen applications in other areas with the exception of *brand* management, choice, and *strategy*. There is no reason why SEMs cannot be used or should not be used in these areas and we look forward to such applications in the future.

As may be expected, regression has been used in all the areas. However, the use of certain techniques such as time series, conjoint analysis and MDS, generalized least squares and two-stage least squares, cluster analysis, discriminant analysis, negative binomial, beta binomial, and Dirichlet multinomial distributions, Bayesian analysis, latent class analysis, and Monte Carlo simulations have been confined to certain areas. By the same token, several areas have not experienced the application of specific techniques to any significant degree.

As stated earlier, certain techniques are well suited for investigating certain types of problems. Yet, as we move into the next century, one hopes that innovative application of these techniques would be made to address important substantive issues in areas where these techniques have heretofore not been applied. Also, several substantive areas could benefit from the application of a variety of different techniques. *Marketing* researchers are also encouraged to develop new techniques and to creatively borrow techniques being developed in other disciplines.

The matrix of Table 2 was analyzed by using correspondence analysis. The resulting two-dimensional plot is shown in Figure 1. Objects more distant from the origin are fit well by the procedure. While it is not meaningful to interpret between set differences, Figure 1 is helpful in assessing the similarity between techniques and the various application areas. Note that the popular techniques ANOVA and SEM are distant from each other on Dimension 1. These techniques have been applied to address different substantive areas. On the other hand, the proximity of regression and logit is also understandable. We encourage the reader to make other such interpretations from Figure 1.

## CONCLUSIONS

Since our last review (Malhotra 1988), the field of *marketing* research has made substantial progress. This progress encompasses several substantive areas as well as techniques. As we step into the twenty-first century, the development of *marketing* research would be enhanced if we devote attention to theory development, measurement, research design, estimation procedures, cross-fertilization of techniques and substantive areas, research in different settings, international *marketing* research, and the bridge between academic and commercial *marketing* research.

*Marketing* research must be grounded in theory. Theory enables us to meaningfully interpret and integrate the findings with previous research. Due to an underutilization of existing theory, our understanding of several substantive areas is limited despite numerous studies. Consumer information seeking represents a case in point. Plausible theories of how consumers actively and passively search for information have not received due attention, and hence our understanding of this phenomenon is lacking.

Despite considerable progress, the quality of measures that are used in *marketing* research needs to be improved further. There is a need for more detailed conceptualizations and use of a greater number of more specific measures. Multi-item scales should be developed and multiple methods should be used to measure key variables. The psychometric properties should be assessed and the structure of multidimensional constructs specified. Procedures based on structural equation modeling can be very useful for this purpose. Moreover, appropriate research designs should be employed. Several meta-analyses, including those reported in this article, have consistently

affirmed the impact of research design characteristics on the results. Yet, this remains a fault of many studies. For example, the exclusive reliance on laboratory experiments to study *brand* extensions, which characterizes many of the studies reported here, has inherent limitations as such studies lack external validity.

There is also a need to develop more powerful, yet computationally tractable estimation procedures, as we have highlighted in several areas. Moreover, there should be a cross-fertilization of areas and techniques, as indicated earlier. To examine the generalizability of findings, *marketing* research should be conducted in different settings. For example, most research on *market* response models has been conducted on mature, frequently purchased products. Can these findings be generalized to new products, durable goods, and industrial products? In addition, the international aspects of *marketing* research deserve far greater attention. Of the combined revenues for the world's top 25 research firms, 45 percent come from operations outside the borders of the home countries of these firms (Honomichl 1998). The increasingly international orientation of the *marketing* research industry is not reflected in the articles published in JMR.

Finally, for progress to be experienced at the practical level, the gap between academic and commercial *marketing* research must be bridged. As we move into the next century, it will be more important than ever that *marketing* researchers examine substantive issues that are managerially relevant. Moreover, given the need for information on a real time basis, methodological and technological advances should be undertaken to greatly reduce the *marketing* research cycle time and complete projects in a few hours rather than a few months. Finally, the research process should be reengineered to become more sensitive to the needs of the other stakeholders besides the researchers, the managers, the respondents, and the general public.

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**TABLE 1 A Classification of Articles Published in JMR 1987-1997 Based on the Primary Thrust**

Legend for Chart:

- A - Subject
- B - 1987
- C - 1988
- D - 1989
- E - 1990
- F - 1991
- G - 1992
- H - 1993
- I - 1994
- J - 1995
- K - 1996
- L - 1997
- M - Cumulative

A                    B        C        D        E        F        G        H        I        J        K        L        M

Covered in this article



	2	2	4	1	1	0	1	0	2	2	0	15
Segmentation research	3	1	3	0	0	4	0	0	0	0	1	12

NOTE: Subjects with five or fewer cumulative number of articles have not been included.

**TABLE 2 Application of Techniques**

Legend for Chart:

- B - Expt.
- C - ANOVA
- D - Time-Series Stochastic
- E - Conjoint/MDS
- F - Regress./WLS/SUR
- G - GLS/2SLS 3SLS/NL
- H - Struct. Eqs.
- I - Logit/Prob. Tobit
- J - Theory/Concept.
- K - Cluster/Discrim.
- L - Descrip.
- M - NBD/BBD DMC
- N - Bayes
- O - Latent Class
- P - MC Simulat.
- Q - Cumulative

A	B	C	D	E	F	G
	H	I	J	K	L	M
			N	O	P	Q
<b>Advertising</b> /media	2	30	1	1	5	3
	6	3	2	0	0	0
			0	0	1	54
<b>Brand</b> evaluation/choice	5	11	3	2	4	0
	0	16	0	2	4	2
			4	0	1	54
<b>Brand</b> management	3	0	2	0	2	2
	0	3	0	1	0	1
			0	1	0	15
Channels	0	0	0	0	4	1
	8	2	0	0	1	0
			0	0	0	16
Consumer behavior	4	11	2	0	5	2
	5	5	1	3	3	0

			2	0	1	44
Measurement/scaling	0	1	2	6	1	0
	9	2	0	0	0	2
			0	1	1	25
New-product development	2	2	1	0	5	0
	3	6	4	0	0	1
			1	1	0	26
Pricing	1	2	1	1	1	1
	2	1	1	0	1	0
			0	0	0	12
Salesforce./selling	1	1	0	0	5	0
	6	2	3	0	1	0
			0	0	0	19
<b>Strategy</b> & planning	1	1	0	0	5	1
	0	0	3	0	1	0
			2	0	0	14
Total	19	59	12	10	37	10
	39	40	14	6	11	6
			9	3	4	279

NOTE: Discrepancies in subject cumulative counts between this table and Table 1 can be attributed to articles involving more than one technique. Acronyms for techniques are defined as follows: expt. = experimental; ANOVA = analysis of variance; MDS = multidimensional scaling; WLS = weighted least squares; SUR = seemingly unrelated regression; GLS = general least squares; 2SLS = two-stage least squares; 3SLS = three-stage least squares; NL = nonlinear least squares; struct, eqs. = structural equations; logit/prob. = logit and probit models; theory/concept. = theory and conceptual; discrim. = discriminant analysis; descrip. = descriptive study; NBD = negative binomial distribution; BBD = beta binomial distribution; DMC = Dirichlet; MC simulat. = Monte Carlo simulations.

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*FIGURE 1 Correspondence Analysis Results*

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