

Management Science in Marketing: Prehistory, Origin, and Early Years of the INFORMS Marketing College

David B. Montgomery*

S.S. Kresge Professor of Marketing Strategy—Emeritus, Graduate School of Business, Stanford University,
Stanford, California 94305-5015
dbm@stanford.edu

It is now nearly 50 years since the Institute of Management Science was founded and the prestigious journal, *Management Science*, began publication in October of 1954. While I was still a junior in high school in 1954 and several years from discovering *Management Science*, I was privileged to be present at and participate in the exciting days of intellectual ferment in the mid 1960s when management science emerged in marketing and ultimately spawned marketing science. This paper is an attempt to record something of what it was like before the INFORMS Marketing College (thus setting the context in which the College emerged), how the Marketing College was formed, and the early years of both the College and management science in marketing. It is probably not too soon to record these recollections while the principals are still alive and have most of their faculties (an assumption lacking in empirical support).

Prehistory

It is convenient to divide the early years of *Management Science* and marketing into three groups of six years, each corresponding to six volumes of the journal, *Man-*

* David B. Montgomery is the S.S. Kresge Professor of Marketing Strategy-Emeritus at the Graduate School of Business, Stanford University. He was the co-founder of the TIMS Marketing College in 1966–1967. He served as Vice Chairperson for the College (1967–1968), as Chairperson Elect (1971–1972), and as Chairperson (1972–1973). He was the first Marketing Departmental Editor of Marketing for *Management Science* (1969–1971). He edited the initial Special Issue of *Management Science* devoted to marketing. This issue, *Marketing Management Models*, was published in 1971 as Part II of the December issue. He was co-chairman (with Dick Wittink) of the first Marketing Science Conference held at Stanford in March 1979. From 1995–1997 he served as Executive Director of the Marketing Science Institute in Cambridge, MA. He is currently tied as the most prolific author of MSI publications.

agement Science. During the first six years of publication of *Management Science*, marketing was most conspicuous by its relative absence. The first two marketing-related articles weren't published until the second volume¹ and a total of only four marketing-related articles appeared between 1954 and 1960. Since the first six volumes of *Management Science* contained a total of 176 papers, marketing accounted for only a paltry 2.3% of the total. This is perhaps understandable as the agenda of the fledgling TIMS was focused more on developing an identity and methodology for management science itself in these very early years.

By the 1960s things began to accelerate, both in relation to research publication in *Management Science* and in marketing's share of research attention in the journal. Total articles in Volumes 7 through 12 of *Management Science* nearly doubled to 343, and the number of marketing-related articles jumped three and one-half times to 13, or 3.8% of the growing total. See Table 1A for a summary. For a comparison to *Operations Research*, see Table 1B. Interestingly, in the 1950s *Operations Research* published more than twice as many marketing-related articles.² However, by 1966 this had completely reversed itself, as *Operations Research's* coverage fell to half while *Management Science's* rose more than threefold.

A time line of marketing in *Management Science* may be found in Figures 1A and 1B for Volumes 1 through

¹ In contrast, the second issue of the first volume of *Operations Research*, published in 1953, contained an article by John Magee of Arthur D. Little entitled "The Effect of Promotion."

² The marketing-related articles published in *Operations Research* from 1952–1971 are listed in Table 5. The corresponding list for *Management Science* between 1954 and 1972 are listed in Tables 2 and 4. Papers relating to the problem known popularly as "The Traveling Salesman Problem" have not been counted on the grounds that they relate far more to combinatorial optimization issues and essentially not at all to marketing problems.

MANAGEMENT SCIENCE IN MARKETING: PREHISTORY, ORIGIN, AND EARLY YEARS
OF THE INFORMS MARKETING COLLEGE

Table 1A Marketing in the Journal *Management Science*

Years	Volumes	No. of Marketing Articles	Total No. of <i>Management Science</i> Articles	Marketing % of <i>Management Science</i>
1954-1960	1-6	4	176	2.3
1960-1966	7-12	13	343	3.8
1966-1972	13-18	37	720	5.1

Table 1B Marketing in the Journal *Operations Research*

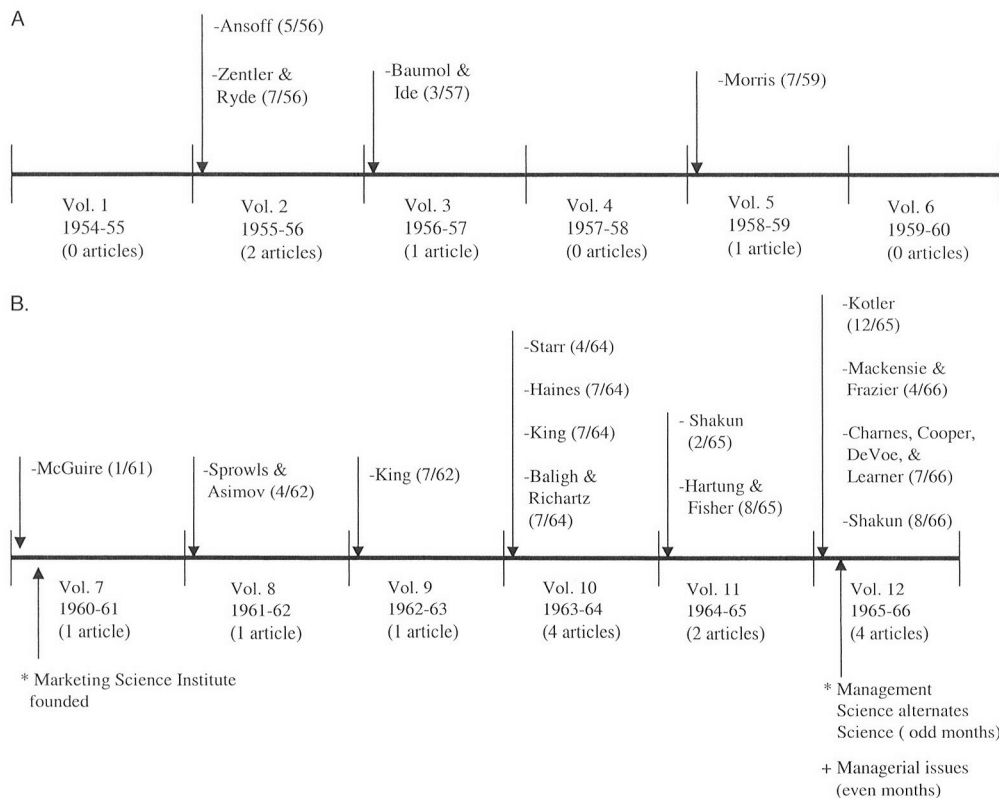
Years	Volumes	No. of Marketing Articles	Total No. of <i>Operations Research</i> Articles	Marketing % of <i>Operations Research</i>
1952-1959	1-7	10	288	3.5
1960-1965	8-13	5	372	1.3
1966-1971	14-19	10	472	2.1

6 and Volumes 7 through 12, respectively. The time line gives visual emphasis to the relatively slow start of marketing's relationship to management science. Nevertheless, by early 1964 marketing's role as an area of research activity in *Management Science* was clearly beginning to blossom. Table 2 presents the titles and authors of the marketing-related papers published in *Management Science* in Volumes 1 through 12.³ A perusal of these figures and table reveals early attention to new products, customer models, marketing organization, market expansion models and analyses (which markets to enter next, etc.), vertical market structures, and even game theory (suggesting antecede-

³I have recorded these in order of publication to allow the reader to reflect on what sorts and sequence of topics were considered during this early period. This information reflects several hours of allergy-afflicted research in the musty stacks of antique journals in the nether regions of Jackson Library at the Stanford Graduate School of Business.

Figure 1A Time Line of Marketing in Management Science: The First Six Years—1954-1960

Figure 1B Time Line of Marketing in Management Science: The Second Six Years—1960-1966



ents to the later wave of economic modeling). It is notable that many of these are still studied even today.

In addition to increasing attention to marketing applications in *Management Science*, the period 1960–1966 also saw related developments crucial to the development of management science in marketing. Executives from Scott Paper and other companies, to foster and support the development of marketing science, founded the Marketing Science Institute in 1961. MSI was conceived as a partnership of marketing academics and business professionals dedicated to creating and disseminating new, more scientific knowledge relating to marketing. (See Bloom 1987 for a history of the results of this partnership over the first couple of decades.) The Ford Foundation funded Institutes of Basic Mathematics for Application to Business at Harvard during 1959–1960, whose purpose was to train faculty for further research and knowledge dissemination. The participants at the marketing institute published a book on mathematical models in marketing based upon their learning at the institute (Bass et al. 1961). This book was an important milestone to impressionable young doctoral students of that period (such as Don Morrison and this author). It covered most of the extant literature at that time and provided both clarifying editorial commentary and assistance with the underlying mathematics. This work was followed the next year by Frank et al. (1962) *Quantitative Techniques in Marketing Analysis*, which focused more on statistical analysis and research design in marketing. A couple of years later Buzzell (1964) published *Mathematical Models and Marketing Management*, which gave an excellent structured discussion of models and marketing and included five case studies of the application of modeling to marketing problems in companies. These included BBD&O's linear-programming approach to media selection, du Pont's measurement of the effects of advertising, a Benton and Bowles simulation of the advertising communications process, and a couple of disguised cases relating to sales force allocation and decision analysis of a pricing problem. In Volume 12, *Management Science* recognized the need for increased emphasis on actual application to management problems and began alternating the now monthly issues of *Management Science*, with even months dedicated to

managerial issues and odd months dedicated to "science." So early on, actual applications were seen to be an important part of management science in marketing.

The American Marketing Association's flagship journal, the *Journal of Marketing Research*, began publication in 1964. While the emergence of this highly respected journal gave increasing impetus to the development of more scientific marketing, in the early years it was particularly unfriendly to analytic models, which were an important part of the management scientist's tool kit. The early *JMR* emphasized empirical models and methods to the virtual exclusion of other forms of modeling. While I regard myself as an empiricist at heart, there seemed to me to be little place for other types of models at *JMR*. Optimizing models were typically dismissed with the statement that all that was shown in a paper was that at optimum levels of marketing activities, marginal revenues must equate to marginal costs (which the economists had known for years). As indicated in Table 2,⁴ *Management Science* had begun to fill this gap in the marketing literature during the 1960–1966 period, particularly after 1963.

So, by the mid 1960s the stage was set for the development of a professional organizational focus on marketing by management scientists. The remainder of this essay will trace the origin and the early evolution of this organization. The remaining essays will pick up the story from there.

The Origin of the INFORMS (TIMS) Marketing College

My rookie year on the faculty of the MIT Sloan School of Management (1966) was a momentous one for me. During the first half, I was finishing my Stanford dissertation on stochastic choice models (under Bill Massy, later the first chairperson of the INFORMS Marketing College) and teaching two courses, Marketing Management and Marketing Research. For a young

⁴Note that the articles in Tables 2 and 4 correspond to those in Figures 1 and 2, respectively. The articles appear in the sequence in which they were published and the complete references are given in Tables 2 and 4.

Table 2 Marketing Articles in *Management Science*: Before the Marketing College (1954–1966)

- A. 1954–1960 Volumes 1–6
1. Anchen, M. (April 1956). "Management Science in Marketing: Status and Prospects."
 2. Zentler, A. P., D. Ryde (July 1956). "An Optimum Geographic Distribution of Publicity Expenditure in a Private Organization."
 3. Baumol, W., E. Ide (October 1956). "Variety in Retailing."
 4. Morris, W. T. (July 1959). "Some Analysis of Purchasing Policy."
- B. 1960–1966 Volumes 7–12
1. McGuire, C. B. (January 1961). "Some Teams Models of a Sales Organization."
 2. Sprowls, R. C., M. Asimov (April 1962). "A Model of Customer Behavior for the Task Manufacturing Corporation."
 3. King, W. R. (July 1963). "Marketing Expansion—A Statistical Analysis."
 4. Starr, M. K. (April 1964). "Management Science and Marketing Science."
 5. Haines, G. H. (July 1964). "A Theory of Market Behavior After Innovation."
 6. King, W. R. (July 1964). "Performance Evaluation in Marketing Systems."
 7. Baligh, H. H., I. E. Richartz (July 1964). "An Analysis of Vertical Market Structures."
 8. Shakun, M. (February 1965). "Advertising Expenditure in Coupled Markets—A Game Theory Approach."
 9. Hartung, P. H., J. L. Fisher (August 1965). "Brand Switching and Mathematical Programming in Market Expansion."
 10. Kotler, P. (December 1965). "Competitive Strategies for New Product Marketing Over the Life Cycle."
 11. Mackensie, K. D., G. D. Frazier (April 1966). "Applying a Model of Organization Structure to the Analysis of a Wood Products Market."
 12. Charnes, A., W. W. Cooper, J. K. DeVoe, and D. B. Learner (July 1966). "DEMON: Decision Mapping Via Optimum Go-No Networks."
 13. Shakun, M. F. (August 1966). "A Dynamic Model for Competitive Marketing in Coupled Markets."

management scientist, teaching these marketing courses was a particular challenge because I had never taken a marketing research course, and the two case courses on marketing management I had taken at Stanford in 1961 (grade labeling of walnuts and other exciting topics) had struck me as an intellectual vacuum. I never would have thought to apply my management science interests to marketing had not Bill Massy and, a year later, Ron Frank come to Stanford from MIT and Harvard in 1962 and 1963, respectively. Nevertheless, I found that my comparative advantage in the development of stochastic choice models did not greatly impress even the MIT students.

That July (1966) a momentous intellectual occasion in the development of marketing science occurred with the holding of the Purdue Symposium, "Applications of the Sciences in Marketing Management," cochaired by Frank Bass, Charles King, and Edgar Pessemier (1968). This event was designed to survey and summarize recent research in marketing in order to understand the state of the art, to suggest future research, and to explore their managerial significance. An outstanding group of researchers were commissioned to prepare papers in the areas of consumer behavior and normative models, behavioral theories of consumer behavior, and experimental methods and simulation models in marketing management. Fortunately, a few of us newly minted Ph.D.'s (including Don Morrison and myself) were included as attendees. The attendee list for this conference formed the basis for the original mailing to those who might be interested in the formation of a TIMS College on Marketing.

Shortly after the conference I began to think that there was a need for an association of professionals interested in developing a more scientific approach to marketing. Because TIMS was my primary professional home (management science was each of my MBA and Ph.D. majors at Stanford), I naturally thought of TIMS as the home for such a group. Furthermore, TIMS was increasingly becoming a welcome home for marketing applications. In October 1966, TIMS already had a dozen colleges—Information Systems, Logistics, Management Communications, Management Control Systems, Management Philosophy, Managerial Psychology, Managerial Economics, Measurements in Management, Organization, Planning, R&D, and Simulation and Gaming—but nothing in marketing. So, I developed a survey to assess interest in the possibility of forming a TIMS Marketing College and mailed it out to a convenience sample of attendees at the Purdue Conference in July, as well as to others suggested by those attendees. I still remember the first reply was from Al Silk (then at Chicago), enthusiastically endorsing the college idea. With such keen insight on his behalf we could do nothing but hire him at MIT, so we did, to the great benefit of MIT. Eighty-nine completed questionnaires out of 139 were returned for a

64% response rate. Forty-one said they would definitely join a marketing college, while another 34 said they probably would. Given the initial strong reinforcement from Al Silk and the expression of interest from many others, I concluded that we had the numbers to proceed with the founding of the college. A Planning Board was formed for the Marketing College consisting of Paul Green (Wharton), George Haines (Rochester), James Heskett (Harvard), John Little (MIT), William Massy (Carnegie Tech and Stanford), Alvin Silk (Chicago), Martin Starr (Columbia), with myself (MIT) and Leonard Simon (Rochester) as the cochairs. The TIMS Council was petitioned in December 1966 to charter the TIMS Marketing College, and they did so in early 1967.

The American Marketing Association was reported to have gotten wind of the Marketing College organizing effort and was considering what to do to prevent what they saw as a professional encroachment by TIMS. Paul Green (one of the original TIMS conspirators) suggested to the AMA, as an AMA board member, that the College would succeed or fail on its own merit and, besides, the young "turks" starting the college wouldn't find the AMA concern compelling. Fortunately, the AMA never offered any overt opposition to the fledgling Marketing College and the College soon thereafter became an important partner in the summer AMA Educator's Conference.

From the outset, the college had as its objective to provide professional exchange between industry professionals, management scientists from other disciplines, and academic researchers in marketing (Montgomery 1967a). It was recognized from the outset that getting the first two groups involved would be a substantial, albeit vital, challenge. Pursuant to this a special appeal was made to industry practitioners to help shape the College's agenda (Montgomery 1967b). Naturally, the College would be expected to organize sessions at TIMS meetings, but it was recognized that this alone would not justify the formation of a college. Three concrete initial suggestions for Marketing College activities were: 1) triannual surveys of the state of implementation in industry, 2) circulation of research documents and annotated references to available research documents, via some form of College

newsletter, and 3) a compilation of research activities relating to management science in marketing. In retrospect I guess that one out of three is a pretty good batting average.

The contributions of Leonard Simon cannot be overstated. He undertook to develop a draft of the original bylaws for the College (a task that the author probably still would not have finished even today). He and George Haines (Rochester) conducted a successful membership drive in March 1967. While initial (1967) data seem unavailable, TIMS reported 165 Marketing College members in 1968 and the membership directory from the TIMS College on Marketing Newsletter (Vol. 2, No. 3) in June 1969 shows 148 names, 71 from industry. At least initially, the goal of a mix of industry and academic marketing management scientists seems to have been achieved. By 1991 the total number of College members had reached 555.

The organizing meeting of the newly chartered TIMS Marketing College, attended by about 30 people, was held in conjunction with the TIMS meeting in Boston on April 6, 1967. Len Simon served as secretary and I chaired the meeting. Considerable discussion was given over to how to balance the needs of both the industry and academic management scientists in the College. Pursuant to this, at this meeting the College charter was unanimously revised to require that the governing council of the College—consisting of the chairperson, vice chairperson, secretary/treasurer, and three council members—should contain a minimum of two whose principle affiliation is industry and two from academia. Table 3 presents the TIMS Marketing College officers and council members from the inception in 1967 to 1972. The reader should note that for these first 5 years, the officers and council were perfectly balanced with three each from industry and academia.

Post-Founding Evolution of Management Science in Marketing

Management science in marketing began very rapid growth with the founding of the Marketing College. I suspect the causal arrow points in both directions

MONTGOMERY
Management Science in Marketing

Table 3 TIMS Marketing College Officers 1967-1972

Years	Chairperson	Vice Chair.	Secretary/Treasurer	Council*
1967-68	W. Massy Stanford	D. Montgomery M.I.T.	L. Simon Rochester	D. Learner BBD&O M. Greenberg P & G I. J. Abrams MRCA
1968-69	P. Kotler Northwestern	L. Simon U. of Rochester	D. G. Morrison Columbia	G. Eskin Pillsbury D. Gluck du Pont M. Greenberg P & G
1969-70	M. Greenberg P & G	F. Bass Purdue	L. Lodish Wharton	F. Nicosia U. C. Berkeley H. Shycon Applied Decision Systems L. Simon Rochester Comm. Savings Bank
1970-71	P. Green Wharton	M. McNiven Coca Cola	J. Myers U. C. Berkeley	W. Moran Lever Brothers A. Silk M.I.T. L. Simon Rochester Comm. Savings Bank
1971-72	H. Claycamp N. W. Ayer	Y. Wind Wharton	D. Aaker U. C. Berkeley	J. Andrews General Foods R. Garrett Eli Lilly P. Green Wharton D. Montgomery Stanford—Chair. Elect

*Chairperson-Elect is ex officio on the Council.

in this development. Shortly after the founding of the Marketing College (August 1967), Ken Longman began publishing a Marketing Science column in *Management Science*. He was a practitioner from the New York advertising community and had been runner-up to Bill Massy to become the first-ever chairperson of the Marketing College.

Conferences abounded. That same month (August 1967) MIT introduced the first "Management Science in Marketing" seminar for practitioners. This workshop was developed by Glen Urban and me and included our MIT colleagues Arnold Amstutz and John

Little. Over 30 practitioners attended who were exposed to early drafts of *Management Science in Marketing* (Montgomery and Urban 1969). The first college-sponsored workshop, "Management Science in Marketing," occurred just prior to the AMA Summer Educator's Conference held in Denver in August 1968. Some 80 persons attended this workshop, cochaired by Len Simon and me, which included presentations by David Learner on "New Product Planning," John Little (of the Little Award fame) on "Media Selection," Irv Gross on "Analysis of Creative Strategies in Advertising," Franz Edelman (of the Edelman Award

fame) on "Competitive Bidding," Harvey Shycon on "Distribution Systems," Bill Massy on "Implementation of Marketing Plans," and Len Simon and myself on "Implications of Management Science in Marketing." (I trust by now that the reader will have noted the tendency for most things in these early years to be named "Management Science in Marketing." Why not? This title had brand equity back then!) The first Marketing College Council meeting was held at this workshop.

Eleven months later (in July 1969), the College sponsored a symposium, funded by and held at the University of Chicago, entitled "Behavioral and Management Science in Marketing." Cochaired by Harry Davis and Al Silk, the symposium consisted of papers in the areas of consumer brand choice, advertising, and new products. Luminaries such as George Day, Don Morrison, Franco Nicosia, John Myers, John Little, Mike Ray, Len Lodish, William McGuire, Glen Urban, Tom Robertson, Jerry Herniter, and Vic Cook presented papers in the three areas (see Davis and Silk 1978).⁵ I have always regretted having missed this conference due to the fact that my wife and I and our three children were spending the summer in India at the Indian Institute of Management in Calcutta.

When the editor in chief of *Management Science*, Martin Starr of Columbia, decided to revise the editorial structure at the journal and vest publications decisions in the hands of a dozen departmental editors, marketing became one of the original 14 departments at the journal. This clearly reflected TIMS' growing regard for marketing as an area for management science practice. Marty asked me, a third-year assistant professor at MIT, to become the first marketing department editor. I was flattered and elated and immediately went to tell my dean. His reaction was that it sounded great if it was something I really wanted to do, but he warned me that it should in no way interfere with my research output, if I hoped to survive my academic childhood. Right. Take it out of sleep and family. (Sorry, kids, I'm afraid

⁵The delay in publication of the book until 1978 had a great deal to do with the fact that the original publisher, Ronald, had been bought out by Wiley. See Silk or Davis for the gory details. In the end, the publisher did the right thing.

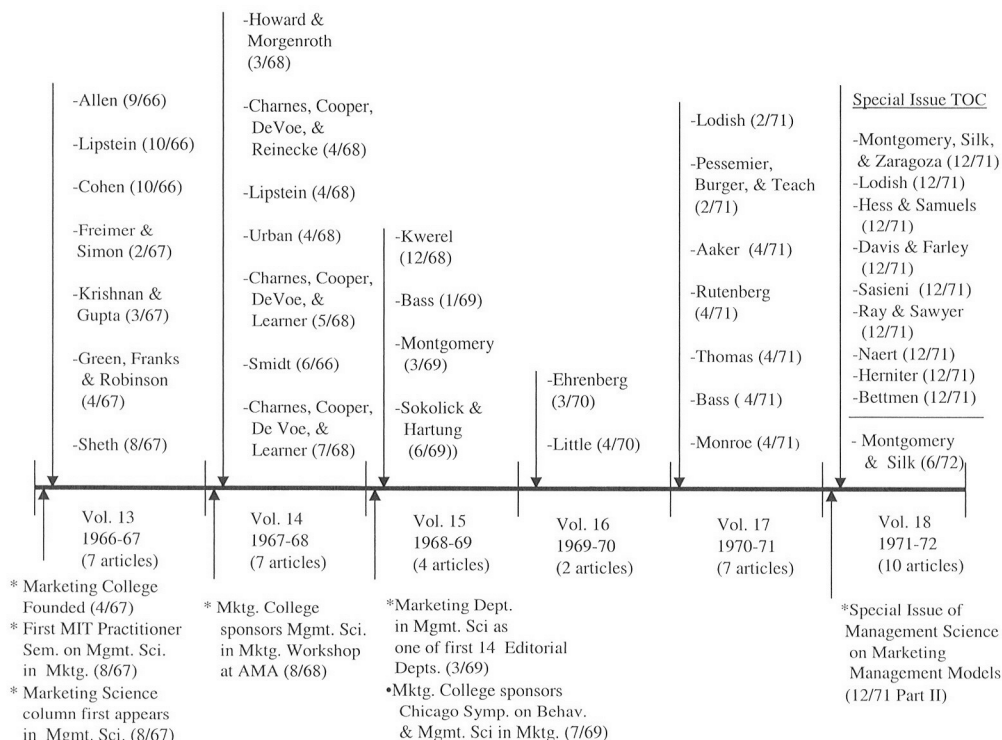
there was some of the latter, although I tried to confine it to the former.)

Naturally, the Marketing College sponsored sessions at the various TIMS meetings, both domestically and internationally. A recurrent theme was the issue of implementation and how to achieve it. The College also became very active at the summer AMA Educators' Conference, where its evening meeting (and cocktails) provided a valued gathering point for quantitative marketers at these meetings. The August 1972 Marketing College evening session at the AMA Educators' Conference drew 70 attendees to a panel on "Implementation," cochaired by Jerry Wind (Wharton) and a friend from Stanford Ph.D. days (this author). The November 1972 issue of the Newsletter of the TIMS College on Marketing noted that a new journal, the *Journal of Consumer Research*, was being formed with TIMS and the Marketing College as one of the sponsoring organizations and Jerry Wind as the TIMS representative. In that same issue it was noted that at the AMA Educators' Conference next August, the Marketing College would conduct a symposium on computer and model-based case analysis for facilitating MBA and executive education. Some of those cases (with updated dates, of course) remain in active service, even now in 2001 (Day et al. 1973 and Eskin and Montgomery 1975). Later, with the development of the Marketing Science Conference, the Marketing College no longer participated in the AMA meetings. However, it played an important role in the interim.

In the late 1960s and early 1970s several more books appeared which helped to accelerate the development of management science in marketing. Amstutz' (1967) book on large-scale simulation models and Massy, Montgomery, and Morrison's (1970) book on stochastic choice models were both original research monographs. The Montgomery and Urban (1969, 1970) *Management Science in Marketing* and Kotler⁶ (1971) model-building books dealt with the broader field of knowledge in this area. The Marketing Science Institute sponsored two noteworthy books on mathematical promotion models (Hinkle

⁶This book morphed into the Kotler, Lillien, and Moorthy models book still in use today.

Figure 2 Time Line—1966–1972



and Robinson 1967) and multidimensional scaling (Green and Carmone 1970). Green and Rao (1972) made a further contribution to the growing utilization of multidimensional scaling in marketing.

So, during the period 1966–1972 there were many, many supportive developments relating to management science in marketing. I turn now to the story of what was happening at the journal, *Management Science*, during this period.

Management Science During 1966–1972

The “after the Marketing College” period was marked by continued rapid growth in both total publications in *Management Science* and in marketing’s share of that increasing total. Table 1 shows that, for this period, total articles more than doubled and the number of marketing articles nearly tripled, rising to 5.1% of the total. This explosive growth may be readily seen in Figure 2. Interestingly, by the last year of this period, 1971–1972, marketing’s share of total articles had risen to 6.4%, while its share of managerial application articles had jumped to 14.5%. Table 1B shows that

Management Science now had about three and one-half times the marketing coverage of *Operations Research* and more than twice the proportional representation.

Table 4 presents, by volume, the marketing articles which appeared in *Management Science* between 1966–1972. There were a substantial number of articles relating to new products and advertising. Consumer/customer models, methods, pricing, and further game theory developments also received attention. Among the other papers published during this period, two classic ones were written by Bass (1969) and Little (1970). The former introduced the Bass durable new product model that virtually spawned its own research industry. This innovator/imitator model has enjoyed a long life in the literature and has led to many subsequent papers. The Little paper introduced the creative notion of a decision calculus and also fostered much subsequent research.⁷

⁷ I cannot resist telling the story of how the decision calculus paper came to be published in *Management Science*. When I returned from India in September 1969, having missed that Chicago Conference, I



Table 4 Marketing Articles in *Management Science*: After the Marketing College 1966–1972 Volumes 13–18

Volume 13 1966–67

1. Allen, R. W. (September 1966). "Factors Influencing Market Penetration."
2. Lipstein, B. (October 1966). "Prospects for Management Science in Advertising."
3. Cohen, S. I. (October 1966). "The Rise of Management Science in Advertising."
4. Freimer, M., L. Simon (February 1967). "The Evaluation of Potential New Product Alternatives."
5. Krishnan, K. S., S. K. Gupta (March 1967). "Mathematical Model for a Duopolistic Market."
6. Green, P. E., R. E. Frank, P. J. Robinson (April 1967). "Cluster Analysis in Test Market Selection."
7. Sheth, J. N. (August 1967). "A Review of Buyer Behavior."

Volume 14 1967–68

1. Howard, J. A., W. M. Morgenroth (March 1968). "An Information Processing Model of Executive Decisions."
2. Charnes, A., W. W. Cooper, J. K. DeVoe, D. B. Learner, W. Reinecke (April 1968). "A Goal Programming Model for Media Planning."
3. Lipstein, B. (April 1968). "Test Marketing: A Perturbation in the Market Place."
4. Urban, G. L. (April 1968). "A New Product Analysis and Decision Model."
5. Charnes, A., W. W. Cooper, J. K. DeVoe, D. B. Learner (May 1968). "DEMON MARK II: An Extremal Equation Approach to New Product Marketing."
6. Smidt, S. (June 1968). "Flexible Pricing of Computer Services."
7. Charnes, A., W. W. Cooper, J. K. DeVoe, D. B. Learner (July 1968). "DEMON MARK II: Extremal Equations Solutions and Approximations."

Volume 15 1968–69

1. Kwerel, S. M. (December 1968). "Information Retrieval for Media Planning."
2. Bass, F. M. (January 1969). "A New Product Growth Model for Consumer Durables."
3. Montgomery, D. B. (March 1969). "A Stochastic Response Model with Application to Brand Choice."
4. Sokolick, W. D., P. H. Hartung (June 1969). "Catalog Advertising Allocation."

Volume 16 1969–70

1. Ehrenberg, A. S. C. (March 1970). "Models of Fact: Examples from Marketing."
2. Little, J. D. C. (April 1970). "Models and Managers: the Concept of a Decision Calculus."

Volume 17 1970–71

1. Lodish, L. (February 1971). "Considering Competition in Media Planning."
2. Pessemier, E., P. Burger, R. Teach (February 1971). "Using Laboratory Brand Preference Scales to Predict Consumer Brand Purchases."
3. Aaker, D. (April 1971). "The New Trier Stochastic Model of Brand Choice."
4. Rutenberg, D. P. (April 1971). "Three Pricing Policies for a Multi-Product Multi-National Company."

Table 4 Continued

Volume 13 1966–67

5. Thomas, J. (April 1971). "Linear Programming Models for Production-Advertising Decisions."
6. Bass, F. M. (April 1971). "Decomposable Regression Models in the Analysis of Market Potentials."
7. Monroe, K. B. (April 1971). "The Information Content of Prices: A Preliminary Model for Estimating Buyer Response."

Volume 18 1971–72

Note: The first nine articles below were in the Special Issue of *Management Science* on Marketing Management Models and were published as Part II of the December 1971 issue.

1. Montgomery, D. B., A. J. Silk, C. E. Zaragoza (December 1971). "A Multiple-Product Sales Force Allocation Model."
2. Lodish, L. M. (December 1971). "CALLPLAN: An Interactive Salesman's Call Planning System."
3. Hess, S. W., S. S. Samuels (December 1971). "Experiences with a Sales Districting Model: Criteria and Implementation."
4. Davis, O. A., J. U. Farley (December 1971). "Allocating Sales Force Effort with Commissions and Quotas."
5. Sasieni, M. W. (December 1971). "Optimal Advertising Expenditure."
6. Ray, M. L., A. G. Sawyer (December 1971). "Behavioral Measurement for Marketing Models: Estimating the Effects of Advertising Repetition for Media Planning."
7. Naert, P. A. (December 1971). "Optimizing Consumer Advertising, Intermediary Advertising, and Markup in a Vertical Market Structure."
8. Herniter, J. (December 1971). "A Probabilistic Market Model of Purchasing Timing and Brand Selection."
9. Bettman, J. R. (December 1971). "Analyzing Consumer Information Processing Models: A Graph Theory Approach."
10. Montgomery, D. B., A. J. Silk (June 1971). "Estimating Dynamic Effects of Market Communications Expenditures."

It should be noted, however, that during this period (1966–1971) *Operations Research* published some very noteworthy marketing papers. See Table 5 for the marketing papers from *Operations Research* during the

found that my colleague (and boss), John Little, had written the now-famous decision calculus paper for the Chicago Conference. As the newly minted Departmental Editor for Marketing at *Management Science*, I asked John what he planned to do with the paper. As I recall, he replied that he would probably send it to *Operations Research*. I suggested that *Management Science* would be a perfect home for it and would broaden his exposure beyond *Operations Research*, *IFORS*, and the *Sloan Management Review* (then the *Industrial Management Review*). Fortunately, John took pity on his junior colleague and graciously submitted the paper to the Marketing Department at *Management Science*. As they say, the rest is history (John, a very belated thanks).

Table 5 Marketing Articles in *Operations Research* 1952–1959, 1960–1965, and 1966–1971

1952–1959

1. Magee, J. "The Effect of Promotional Effort on Sales," Vol. 1 No. 2 (F/53).
2. Friedman, L. "A Competitive Bidding Strategy," Vol. 4 No. 1 (F/56).
3. Brown, A., F. Hulswitt, J. Kettelle. "A Study of Sales Operations," Vol. 4 No. 3 (June/56).
4. Waid, C., D. Clark, R. Ackoff. "Allocation of Sales Effort in the Electric Lamp Division of the General Electric Company," Vol. 4 No. 6 (D/56).
5. Vidale, M., H. Wolfe. "An Operations Research Study of Sales Response to Advertising," Vol. 5 No. 3 (June/57).
6. Baumol, W., P. Wolfe. "A Warehouse Location Problem," Vol. 6 No. 2 (MA/58).
7. Friedman, L. "Game Theory Models in the Allocation of Advertising Expenditures," Vol. 6 No. 5 (SO/58).
8. Fabian, T., J. Fisher, M. Sasieni, A. Yardeni. "Purchasing Raw Material on a Fluctuating Market," Vol. 7 No. 1 (JF/59).
9. Chacko, G. "An Operations-Research Evaluation Technique of the Use of Sales Research Information," Vol. 7 No. 3 (MJ/59).
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period 1966–1971. These papers included Little's adaptive promotional control of promotion model, Urban's SPRINTER new product model, Farley and Ring's supermarket traffic flow model, Hess' market timing models, Parsons and Bass' optimal advertising implications of simultaneous equation models, and Little and Lodish's media-planning calculus.

The Special Issue on Marketing Management Models

Toward the end of the 1960s, I was asked by TIMS to develop a special issue of *Management Science* devoted to marketing. The resulting special issue on Marketing Management Models was subsequently published as Part II of the December 1971 issue of the journal. The table of contents of this special issue may be found at the end of Table 4. This special issue was the culmination of a long climb for marketing to win respect and attention from the management science community. We had truly arrived.

The special issue papers contained four devoted to various aspects of sales management and reflected a major set of research on this area that heretofore had seen little. These papers also informed practice. Lodish's CALLPLAN model was a decision-calculus-type model designed to extract, organize, and process a salesperson's judgments to plan call strategies on both current and prospective accounts. In a later paper, Fudge and Lodish (1977) used matched pairs of salespersons, with one person in each pair having access to the CALLPLAN model and one having no access. They found, for salespersons in the airline industry, that the salespersons using CALLPLAN had an average of 8.1% higher sales than those not having access.

The Hess and Samuels (1971) GEOLINE model was designed to develop sales and service territories by aggregating smaller units. Based upon models originally developed to provide more objective electoral districting in response to the U.S. Supreme Court's 1967 directive that there should be "one man, one vote," the model was successfully used in a variety of cases. The DETAILER model of Montgomery et al.

(1971) combined judgmentally parameterized response functions with an improvement-seeking heuristic to identify more profitable allocations of salesperson (detailing) effort for a pharmaceutical company. This model was subsequently implemented in several countries and companies. The point here is simply that these were models all designed to assist managers in solving very real and messy problems. Finally, the Davis and Farley (1967) paper began the several-year research area of developing sales commissions and quotas to give incentives to salespersons to better serve a company's objectives. The other papers dealt once again with advertising and consumer modeling.

The last marketing paper of 1971–1972 (Montgomery and Silk), aimed then state-of-the-art specification testing at dynamic regression models of how pharmaceutical communications lead to achievement of market share of new prescriptions. The importance of this paper rests not just with its methodological sophistication, but also with its managerial significance. The measurements showed that absent this measurement of actual market response, managers at the company had, for very understandable reasons, allocated their market communication budget precisely in inverse relationship to measured market response. It is difficult to see how this would not be of interest and concern to managers and be suggestive of needed changes.

With the completion of the special issue, I looked to turn over the reins of the Marketing Department at *Management Science* to my successor. Fortunately, I was able to persuade Don Morrison to take over. He later started *Marketing Science* and was Editor in Chief of *Management Science*, so it seems my choice was a great one.⁸

Summary and Conclusion

As we move forward into a new century, it is good to bear in mind that many of the old problems re-

⁸ I also knew Don's wife, Sherie, in high school before either Don or I had met our wives, but the reader probably does not want to hear any more of this small-world stuff.

main, and some may have gotten worse. Stasch (1967), in the very issue in which a call was made for practitioner participation in the College, sharply critiqued most papers that already had been published on marketing in *Management Science*. He suggested that perhaps management scientists had developed a science for management scientists rather than a science for management. Consequently, practitioners were not listening. A few years later, Claycamp (1971), then chairperson of the Marketing College, wrote in the College Newsletter:

For several years when I was a professor and consultant, I felt that the gap between the promise and performance of management science techniques in marketing was far greater than it should be. Now, after my first year in the "real world," I am convinced that the gap is large, that it is growing, and that it represents a serious problem for the profession.

Unfortunately, I believe that a major cause of the problem is the tendency of too many of us to devote the vast majority of our energy to the creation of new and more sophisticated techniques and to give inadequate attention to questions of operational significance. As a result, sound approaches are often discarded because of implementation difficulties and, all too often, proposed techniques prove to be elegant solutions to irrelevant problems.⁹ In a time when relevance is at a premium, it is little wonder that many managers question the practical value of management science techniques in marketing.

Very early on Weinberg (1968) ascribed some of the problem with practitioners ignoring management science to the difficulty in keeping up with the explosion in the journals. He suggested extended précis that would be sufficient to present the essential ideas and results of an article. An interested reader could then read the entire article should it prove to be of particular interest to him/her. Note that Rick Staelin, when he was editor in the mid-1990s of *Marketing Science*, essentially implemented this policy. However, it took nearly 30 years for someone to have the insight and courage to do so. Each succeeding generation should heed these warnings, lest they repeat the mistakes of their predecessors.

Perhaps the above critiques account for the fact that the Marketing College, the Marketing Science Confer-

⁹ For a delightful parody of such a problem see the article, "The Wizard Who Oversimplified: A Fable," which appeared as the last article in Montgomery and Urban (1970). This is perhaps the only article in that book that has remained current.

ence, and *Marketing Science* have become predominantly academic. While I am thrilled by the academic success, I must confess to substantial disappointment that we have not managed to maintain contact with practitioners. The founding of the Marketing College and the Marketing Science Conference clearly had enhancing this contact as a vital goal. I fervently hope that in the 21st century we will be able to address this goal more successfully. See Lew Pringle's "The Academy and the Practice" in this issue for cogent arguments and examples why everyone in the profession—whether practitioner or academic or hybrid—should be concerned with achieving this goal.

To those of us privileged (and old enough) to have been there as management science took its place in marketing, those were exciting times. We never could have foreseen the great success of the College (the number of members in the several hundreds), the Marketing Science Conference (with several hundred attendees), and the foundation of marketing's own journal of management science, *Marketing Science*, funded in good measure by the Marketing Science Conference. It is with great satisfaction that many of us look back on this time. However, the success that these efforts have had would not have been possible without the selfless service and intellectual and creative power of the many who came after the pioneers. We are greatly in your debt for making our early efforts pay off. To you we bequeath the institutions for the furtherance of our profession. In your capable hands we know that management science in marketing and marketing science will go forward in the new century to the enhancement of management, marketing and, hopefully, global society.

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