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1993-2003**

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THE EVOLUTION OF THE SERVICE MARKETING LITERATURE: 1993-2003

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ABSTRACT

This article analyzes service research published in marketing journals from 1993 to 2003. Through a content analysis, we study the relationships between service marketing subfields. A MCA allows us to map keywords and authors, and track this literature over the past eleven years. A discussion of the future of service research is also provided.

Keywords: Evolution, Service Research Literature, Mapping

INTRODUCTION

In 1993, Fisk, Brown and Bitner and Berry and Parasuraman published two seminal articles on the early developments of a new academic field: service marketing. In these papers, the authors described how service marketing emerged and developed to become an autonomous academic field, independent from general marketing. Eleven years after the publication of these articles, the service marketing field has developed and matured (Grove, Fisk and John 2003). More recently, Fisk, Grove and John (2000; Grove, Fisk and John 2003) have looked at the past, present, and future of service marketing research through the eyes of experts. To complement these studies, we need a structural analysis of the service marketing field. The purpose of this paper is therefore to study this evolution of the research articles published in 10 of the top academic journals from 1993 to 2003 to better understand the structure of the field and the direction it could take in the future.

The service marketing literature having now reached its maturity stage, it is important to identify the breadth and diversity of its content as well as the main directions and magnitude of progress in order to identify desirable directions for future research. The objective of this paper is therefore: first, to map the structure of the service marketing field to identify the interconnections of its subfields; second, to examine the current trends in order to better understand and foresee

their impact on the development of the field; and third, based on the analysis of past research, to provide some clues about the future of this literature.

The paper is structured as follows. First, we present a brief overview of the development of service marketing before 1993 based on the papers by Fisk, Brown and Bitner (1993) and Swartz, Bowen and Brown (1992). This is followed by the description of the method used in the study. We then present the results of the analysis of the content of the service marketing literature published between 1993 and 2003 and its evolution over time. We also examine the most published authors and their position in the service marketing field. We conclude the paper with a discussion of some concerns about the future of the service marketing field.

DEVELOPMENT OF SERVICE MARKETING: AN OVERVIEW

Using an evolutionary metaphor as a framework for their study, Fisk, Brown and Bitner (1993) traced the evolution of the service marketing literature from its embryonic beginnings in 1953 until its maturity in 1993. They identify three stages in this evolution: *Crawling Out* (1953-79), *Scurrying About* (1980-1985), and *Walking Erect* (1986-1993).

During the *Crawling Out* stage (1953-79), scholars in the service marketing field first fought to assert the discipline's right to exist (Fisk, Brown and Bitner 1993; Swartz, Bowen and Brown 1992). This stage began in 1953 with the first service marketing scholars struggling to publish their work and culminated with the debate of how and why services were different from goods (e.g., Shostack 1977). From this early work came the identification of some of the distinctive characteristics of services, such as intangibility, inseparability, heterogeneity, and perishability (Shostack 1977).

The *Scurrying About* stage (1980-1985) was a bridging period where the services vs. goods debate began to wane (Fisk, Brown and Bitner 1993). Attention then shifted from “*Are services different from goods?*” to “*What are the implications of these differences?*” (Swartz, Bowen and Brown 1992). Christopher Lovelock tried to answer this question in a seminal article by

classifying services (Lovelock 1983). This stage also saw the first papers in new areas of investigation, such as service design and mapping (Shostack 1984) and service encounter (Czepiel, Solomon and Surprenant 1985), which flourished in the next period.

In the *Walking Erect* stage (1986-1993), scholars achieved a respected stance as service marketing became an established field within the marketing discipline (Fisk, Brown and Bitner 1993). The publications on many of the primary topics matured considerably. These topics include managing quality given the heterogeneity of the service experience, designing and controlling intangible processes, managing supply and demand in capacity constrained services, and organizational issues resulting from the overlap in marketing and operations functions (Fisk, Brown and Bitner 1993; Swartz, Bowen and Brown 1992).

Fisk, Brown and Bitner (1993), documented the founding, emergence, and legitimization of the service marketing literature. They also asked: “What will the literature of the future be like?” and tried to answer this question based on documentation of the past and their positions as active researchers and participants in the field. In their speculations about the future of service marketing research, they predicted a broadening, deepening, and sharpening of the field and identified key research topics for the future. These topics were: service design and delivery, service encounters and service experience, service quality and customer satisfaction, as well as service recovery, reverse marketing, internal marketing and support services, modeling and measurement, and technology infusion. More recently, Fisk, Brown and John (2000; Brown, Fisk and John 2003) asked ten service experts: “What directions would you like to see the services marketing field take in the future?” Their observations could be organized under three broad headings: the nature of services, the scope of services, and services and value creation.

Based on the content analysis of the papers published between 1993 and 2003 in key journals, we want to evaluate Fisk, Brown and Bitner’s (1993) predictions and we also want to estimate the likelihood of the service marketing field going in the direction wished by the expert interviewed by Brown, Fisk and John (2003).

METHOD

To examine the content of the service marketing literature, trace its evolution, and identify main streams of research, we first performed a content analysis of the papers published in the top journals for service marketing research over the period 1993-2003. A content analysis provides a means for the objective, systematic, and quantitative consideration of published articles.

Journals and Papers Selection

Over the past eleven years, the number of articles on service marketing topics has exploded. Consequently, it was impossible for us to include all the papers published since 1993 in this study, we, therefore, decided to limit our investigation to the papers published in top service journals and the top general marketing journals. Three top service-oriented journals were selected: the *Journal of Services Marketing* (JSM), the *Journal of Service Research* (JSR), and the *International Journal of Service Industry Management* (IJSIM). Using Hult and Neese's (1997) ranking to identify the leading general marketing journals, we selected: the *Journal of Marketing* (JM), the *Journal of Marketing Research* (JMR), the *Journal of Consumer Research* (JCR), the *Journal of Retailing* (JR), the *Journal of the Academy of Marketing Science* (JAMS), and *Marketing Science* (MS). To this list, we added the *International Journal of Research in Marketing* (IJRM) because of its international perspective.

The next step was to select the articles to be analyzed. For our analysis, we selected all research articles published in the service-oriented journals (JSM, JSR, and IJSIM). For the general marketing journals, we only retain articles on service marketing topics or framed in a service context. Using the search engine of the ABI/Informs database, we preselected the articles including the keywords "service" or "services" in their titles, abstracts, or keywords. From this preselection, we excluded the articles, which content was not specifically on service marketing or in service industries. We also chose to focus on those articles that were primarily involved with research issues. Therefore, the next step was to ensure that all the articles preselected had a research focus. This resulted in the elimination of articles written by editors and introductions to special issues. This process resulted in the selection of a total of 805 articles.

Keywords Selection

In order to code and analyze the content of the selected articles, we built a list of major themes or categories of keywords. The creation of such a list was made necessary by the large number of keywords issued by authors and found in the ABI/Informs database. To identify these major themes, we started with the list of key research topics developed by Swartz, Bowen, and Brown (1992) and Fisk, Brown, and Bitner (1993). We first allocated the keywords issued by authors and the ABI/Informs database into these major categories. Every time a keyword could not be allocated into one of these initial categories, a new one was created. This resulted in a list of more than 30 major themes. This list was then reviewed by independent service experts. After several rounds of discussion with these independent service experts, a final list of 27 major themes was obtained.

These 27 major themes are: (1) after-sale/customer service, (2) business-to-business services, (3) consumer behaviors, (4) service encounters, (5) e-service/technology, (6) typology of services, (7) innovation, new service development, (8) internationalization and export, (9) methodology and measurement, (10) operations and service design, (11) performance, (12) pricing and yield management, (13) service quality, (14) service failure and recovery, (15) relationship marketing and customer retention, (16) customer satisfaction, (17) strategy, (18) servicescape and tangible cues, (19) communication/promotion/advertising, (20) service offering, (21) ethics, (22) internal marketing and service employee management, (23) competition, (24) non-profit and public services, (25) service distribution/delivery, (26) service usage/purchase, (27) environmental context. Table 1 presents these major themes and the individual keywords they contain.

[Insert Table 1 about Here]

Coding Procedure

Previous studies of journal content have generally classified articles in only one primary category (e.g., Inkpen and Beamish 1994). But, as noted by Inkpen and Beamish (1994) using only one category fails to acknowledge the cross-functional and interdisciplinary nature of an academic field such as service marketing; consequently, following the methodology used by Furrer, Schendel, and Thomas (2002), we decided to allocate articles across one or more keywords.

Each article was examined by two judges who reviewed all the 805 articles. To ensure that each article was properly allocated, a two-step procedure was followed. First, the articles were allocated independently by both judges into the keywords based on a detailed examination of the abstracts. Second, the two judges solved their disagreements through discussion. If disagreement persisted between the judges, a detailed examination of the full-text of the article was made. The reliability of the coding procedure was assessed using Perreault and Leigh's (1989) index. We obtained an index of .91, which is very satisfactory. For each of the 27 keywords, we coded a dichotomous variable: 1 if the paper was allocated into the keyword and 0 otherwise.

Among the 805 articles, 93 (11.5%) were allocated into only 1 keyword, 274 (34.0%) into two, 281 (34.9%) into three, 113 (14.0%) into four, 35 (4.4%) into five, 7 (0.9%) into six, and 2 (0.1%) into seven. The overall mean is 2.7 keywords per articles.

Service quality is the most frequent keyword with 231 papers. It is not surprising as service quality was already identified by Fisk, Brown, and Bitner (1993) as the single most researched area in service marketing in the previous period. Most of the work on service quality is still based on the pioneering articles by A. Parasuraman, Leonard Berry, and Valarie Zeithaml published in the 1980s. Service quality is followed by consumer behaviors (203) and customer satisfaction (195). These two themes are both closely related to service quality. The structural relationships between these three concepts have been the focus of several important papers during the 1990s. The next most important themes are performance (152) and strategy (123). These two related themes have emerged as important topics in the mid 1990. Research on service performance and profitability has strongly been influenced by the work of Roland Rust on return on quality (e.g., Rust, Zahorik and Keiningham 1995). The next important keywords are Relationship marketing and customer retention (109) and Employees (102). These themes were already identified as important by Fisk, Brown, and Bitner (1993), but only take off after 1995.

ANALYSIS OF THE RESULTS

To analyze the content of the articles, we first computed a cluster analysis to identify the keywords which “hang together,” and conversely, to determine where the gaps and clear break points were. Second, we computed a multiple correspondence analysis to complement the cluster analysis and obtain a richer representation of the relationships between keywords. Third, we studied the evolution over time of the relationships between keywords. This analysis gives us the idea of future directions in service marketing research. Finally, we studied the authors who have the most published during our period of study.

Connections among Keywords

To study the connections among keywords, we ran a cluster analysis¹ of the matrix of proximities² between keywords. We focus our analysis on six clusters that are interpretable and substantively coherent and two isolated keywords. The first cluster consists of keywords concerned with *service quality and customer satisfaction*. It contains the following keywords: service quality, customer satisfaction, service employees, after-sales and customer services, consumer behaviors and behavioral intentions, service failure and recovery, service encounter, distribution, methodology. This cluster regroups topics studied from the customer perspective at the encounter level. Keywords in the second cluster are concerned with the *strategic aspects of service marketing*—strategy, competition, performance, international, innovation, operations. The third cluster consists of keywords concerned with *relationship marketing and customer retention*. It contains the following keywords: relationship marketing, B2B, and environment. Research in this cluster focuses on the long-term relationships and interactions between customers and their service providers. Keywords in the fourth cluster are concerned with *technology and value*—technology/e-service, usage/purchase, price/value. This cluster regroups research on the impact of technology in service marketing. The role of the Internet and the emergence of e-services are important topics within the cluster. The fifth cluster includes keywords that focus on *communication and advertising*—communication/promotion, tangible. This cluster regroups the relatively few studies on advertising and communication in service industries. The sixth cluster is concerned with the *service offering* and contains such keywords as: service offering and service typology. Research in this cluster focuses on the characteristics of services. Two keywords are isolated: ethics and non-profit services. These two themes have recently emerged as important research topics and so far only regroup few studies.

A richer representation of the relationships between keywords may be obtained using a multiple correspondence analysis. Multiple correspondence analysis (MCA)³ provides a more detailed and systematic representation of the distances among keywords than a simple cluster analysis. The results of the MCA⁴ are graphically presented in Figure 1. The size of the point for each of the keywords is proportional to its weight (i.e., the number of articles regrouped within the keyword). Proximity between keywords corresponds to shared substance.

[Insert Figure 1 about Here]

The first, horizontal, dimension of the map represented in Figure 1 separates keywords emphasizing the management-side of service marketing (on the right hand-side) from those concerned with the customer-side of service marketing (on the left hand-side). The second, vertical dimension separates keywords, which are at a higher, more strategic level (at the top) from those focusing on a lower, more operational level (at the bottom). In short, the dimensions of the map reflect characteristic “poles” of topical orientation within the service marketing literature.

Evolution over Time

To obtain a dynamic view of the evolution of the service marketing literature and to be able to speculate about its future developments, we divided the eleven years of the publication into two equal periods. The first period runs from 1993 to 1998 and the second one from 1999 to 2003. Based on a simple count of the number of papers published per period and per keyword, we can identify trends in service marketing research. The results show that the number of papers published on consumer behaviors, e-service/technology, internationalization and export, service failure and recovery, relationships marketing and customer retention, customer satisfaction, ethics, service usage/purchase, and environmental context is increasing, while the number papers published on operations and service design, service quality, internal marketing and service employee management, competition, and service distribution/delivery is decreasing. These trends show an increased interest for a customer-focused approach to service marketing opposed to a managerial approach.

For each of the two periods, the position of each keyword in the perceptual map was computed. The results permitted to evaluate the direction of the evolution of the interrelationships among the keywords. This evolution is presented in Figure 2, in which arrows represent the direction of evolution. Diamonds correspond to the position of the keyword during the first period (1993-1998) and the squares correspond to their position during the second period (1999-2003).

[Insert Figure 2 about Here]

Figure 2 shows that most keywords evolve toward the upper left corner of the map, which is toward more strategic customer-side research. This evolution denotes a movement of the service marketing literature departing from an encounter level of analysis toward a more strategic perspective and from a management-side toward a more customer-side approach. This movement is consistent with the changes in the number of papers published for each keyword. Few keywords are moving in a different direction. For example, customer service, operations, and tangible are moving toward the management-side of the map, and innovation is moving up toward a more strategic approach.

Contributing Authors

In their study of the evolution of the service marketing literature from 1953 to 1993, Fisk, Brown, and Bitner (1993) identified the 56 most prolific service marketing authors. It is interesting to compare this list with the list of the most prolific authors from 1993 to 2003. A representation of the positions of these authors on a perceptual map may also be compared to the position of the keywords presented in Figure 1. This analysis gives us some clues to interpret the contribution of the most frequently published authors to the different subfields of service marketing.

The 805 articles published in the selected journals have been written by 1048 different authors. Among these authors 1 (0.1%) published 15 articles, 1 (0.1%) published 11 articles, 2 (0.2%) published 10 articles, 4 (0.4%) published 9 articles, 3 (0.3%) published 8, 5 (0.5%) published 7, 8 (0.8%) published 6, 11 (1.0%) published 5, 26 (2.5%) published 4, 48 (4.6%) published 3, 181 (17.3%) published 2, and 758 (75.1%) published only one article.

Authors can be ranked on the total number of appearances or on adjusted appearances. We based our ranking on the adjusted appearances rather than the total appearances used by Fisk, Brown, and Bitner (1993), because it is the most frequently used (e.g., Furrer, Schendel, and Thomas 2002)⁵. The adjustment method is similar to the one used by Morrison and Inkpen (1991), Inkpen and Beamish (1994), and Furrer, Schendel, and Thomas (2002). The number of adjusted appearances reflects multiple authored articles. If an article was published by two authors, each received one-half of a credit; in the case of three authors, one third of a credit; and so on. 194 (24.1%) papers are single authored, 353 (43.9%) have 2 authors, 214 (26.6%) have 3 authors, 33 (4.1%) have 4 authors, 9 (1.1%) have 5 authors, 1 (0.1%) has 6 authors, and 1 (0.1%) has 7 authors.

The most prolific authors were Anna Mattila, with 7.83 adjusted appearances and 10 total appearances, Peter Danaher, with 5.67 adjusted appearances and 9 total appearances, Jochen Wirtz, with 5.50 adjusted appearances and 11 total appearances, Ko de Ruyter, with 5.20 adjusted appearances and 15 total appearances, Robert Johnston, with 5.20 adjusted appearances and 7 total appearances, and Leonard Berry, with 5.16 adjusted appearances and 10 total appearances (see Table 2).

Among the 56 most prolific authors during the 1953 to 1993 period, eleven are still in the top list during the next period of 1993-2003, they are: Leonard Berry, Valarie Zeithaml, Mary Jo Bitner, Stephen Brown, Christian Grönroos, A. Parasuraman, Evert Gummesson, Raymond Fisk, Benjamin Schneider, Stephen Grove, and David Bowen. This denotes a certain stability of the field. In the last decade, the growing authors are Anna Mattila, Peter Danaher, Jochen Wirtz, Ko de Ruyter, Paul Patterson, Roland Rust, and Martin Wetzels.

[Insert Figure 3 about Here]

These most prolific authors were also represented on a map. An author's position of is represented as the average position of its published articles. Figure 3 represents this map. The

comparison of the map of Figure 3 with the map of Figure 1 shows the topics that are the center of interest of the authors.

CONCLUSION

The analysis of the past eleven years of research in service marketing adopted a past-present orientation. To the extent that these papers reflect the evolution of the service marketing field as a whole, the trends we have observed raise an important question about future of the service marketing fields: “Is the field likely to further concentrate toward a dominant paradigm or to fragment itself into a myriad of subfields?” The results of our analysis show that most of the keywords are moving in the same direction, which is not the center of the map. This move is therefore neither supporting the fragmentation hypothesis, nor the concentration hypothesis. This trend in one dominant direction may mean that the service marketing literature has not yet reach its maturity and is still evolving. Further research is however needed to support this interpretation of our results.

One of the limitations of our study is the necessary limit in the number of selected journals. We only selected 10 of the top journals for service marketing research, but many other outlets also publish service marketing research papers. Conferences proceedings, books, and dissertations are also important sources of service marketing research. The actual profusion of service marketing make it virtually impossible to include all publications in the type of analysis we used. We are, however, confident that our selection of the top journals makes our results valid and reliable. Due to space constraint, we also limited the number analyses we ran. The positioning of the different journals as well as the most influential papers in the map issued from the MCA could provide some interesting and insightful results. We should reserve these analyses for a full-length paper.

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Table 1. Major Themes and Keywords

CATEGORIES	KEYWORDS
Customer and after-sale Services	After-sale services, customer service, call centers, support services, warranties, guaranties.
Business-to-Business (B2B)	Industrial buyers, outsourcing.
Consumer behaviors / behavioral intentions	Word-of-mouth, loyalty, customer referrals, switching behaviors, complaint, consumer search behaviors.
Service encounters	Experience, customer contact, face-to-face, interaction, customer comfort, critical incidents.
e-Service / Technology	Information technology, technology-based self-service, ATM, self-service bias, electronic distribution channels, Internet, online services, e-commerce, cyberservices, Interactive, Interactive marketing, Telemarketing, eCRM.
Typology (types of services)	Classification, classifying, search services, experience services, credence services, types of services, typology good vs. services.
Innovation	Pioneer advantages, technological innovation, new service development, time-to-market, new product adoption, new product diffusion.
International	Cross-cultural management, culture, ethnocentrism, country of origin, cross national, global, export, national regulations, privatization, foreign market entry
Methodology	Critical incident, statistical analysis, case studies methodology, experiment, scale assessment, scale development, measurement issues, questionnaire.
Operation / Service Design	Waiting time, business process management, service mapping, service design, service delivery systems, blueprinting, facility, capacity, demand, queuing, logistics, order processing, capacity management, process re-engineering.
Performance	Profitability, efficiency, productivity, cost, long term performance, service effectiveness, customer equity.
Price / Value	Capacity management, yield management, tipping, optimal pricing, subscription-based services, service value, value, price, pricing, tipping.
Service Quality	Consumer evaluations, expectancy, expectations, SERVQUAL scale, perceptions, SERVPERF.
Service Failure and Recovery	Justice (procedural, distributive, interactional), complaint management, service failure, apology, compensation, perceived fairness.
Relationship Marketing and Customer Retention	Relationship, customer retention, relationship management, long term relationship, commitment, trust, CRM, account management, switching costs.
Customer Satisfaction	Satisfaction, disconfirmation, dissatisfaction, pleasure, arousal, consumer comfort; delight.
Strategy	Segmentation, customer profiling, marketing planning, strategic planning, growth strategy, market strategy, customer retention strategies, differentiation strategy, market entry.
Tangible / Servicescape	Tangibles clues, servicescape, physical surroundings, surroundings, infrastructures, location, layout, atmospherics.
Communication/Promotion/ Advertising	Advertising, sales promotion, messages cues, media exposure, coupon, free samples, communication, image.
Service Offering	Service level, loyalty programs, brand, customer requirement, tailoring, product's service attributes
Ethics	Social responsibility, legality, fairness, bribery, privacy concerns, ecology, environment, stakeholders, code of practice.
Employees	Front-line employees, job autonomy, job satisfaction, customer orientation, internal marketing, internal marketing orientation, work organization, work stress, customer contact.
Competition	Pioneering advantage, competitive advantage, rivalry; benchmark; positioning
Non-profit Services	Public services, voluntary service
Distribution/Delivery	Franchising, e-tailing, retailing; service delivery system, supply chain.
Usage / Purchase	Consumption, preference, decision, adoption.
Environmental context	Service context, environment.

Table 2.**The 56 Most Prolific General Service Marketing Authors (1993-2003)**

Rank	Author	Mean	Rank	Author	Mean
1	Mattila AS	7.83	29	Singh J	2.42
2	Danaher PJ	5.67	30	Schneider B	2.33
3	Wirtz J	5.50	31	Wakefield KL	2.33
4	Johnston R	5.20	32	Gwinner KP	2.33
5	de Ruyter K	5.20	33	ANDERSON EW	2.33
6	Berry LL	5.17	34	McColl-Kennedy JR	2.33
7	Patterson PG	5.00	35	Grönroos C	2.33
8	Taylor SA	5.00	36	Gremler DD	2.33
9	Andreassen TW	4.50	37	Grove SJ	2.17
10	Boshoff C	4.50	38	Brady MK	2.03
11	Bolton RN	3.42	39	Edgett S	2.00
12	Zeithaml VA	3.33	40	Mortimer K	2.00
13	Bitner MJ	3.33	41	Teas RK	2.00
14	Wetzels M	3.17	42	Estelami H	2.00
15	Dabholkar PA	3.17	43	Bettencourt LA	2.00
16	Brown SW	3.17	44	Svensson G	2.00
17	Parasuraman A	3.17	45	Gummesson E	2.00
18	Mattsson J	3.03	46	Sparks B	2.00
19	Kumar P	3.00	47	Shugan SM	2.00
20	Mittal B	3.00	48	Gilmore A	2.00
21	Roos I	3.00	49	Modell S	2.00
22	Rust RT	2.87	50	Hollowell R	2.00
23	Stafford MR	2.83	51	Harrison-Walker LJ	2.00
24	Iacobucci D	2.75	52	Varca PE	2.00
25	Stauss B	2.75	53	Koku PS	2.00
26	Blodgett JG	2.50	54	Yagil D	2.00
27	Winsted KF	2.50	55	Bebko CP	2.00
28	Clow KE	2.42	56	Kelley SW	2.00

Figure 1: Multiple Correspondence Analysis

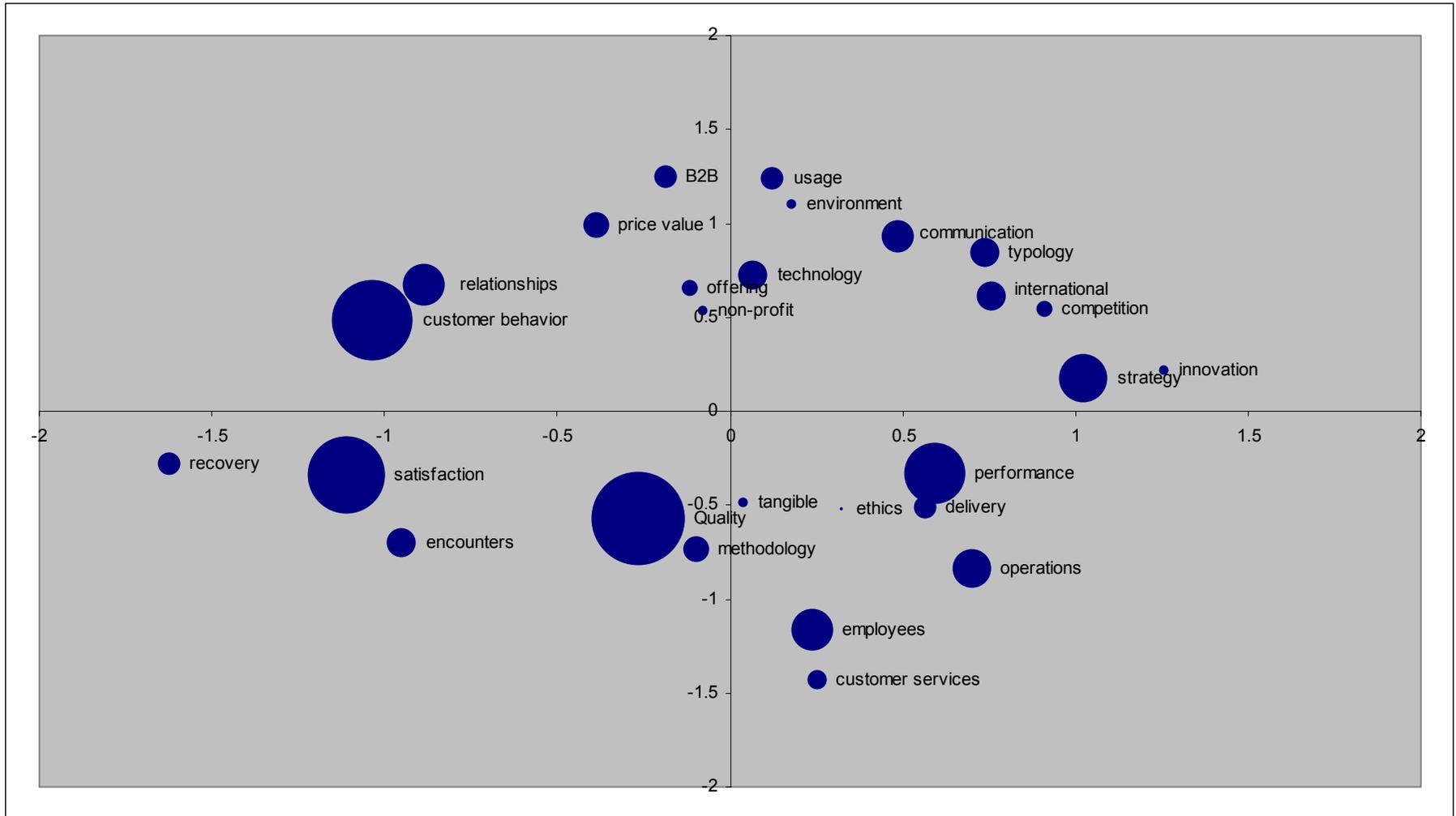


Figure 2. Keywords evolution over time

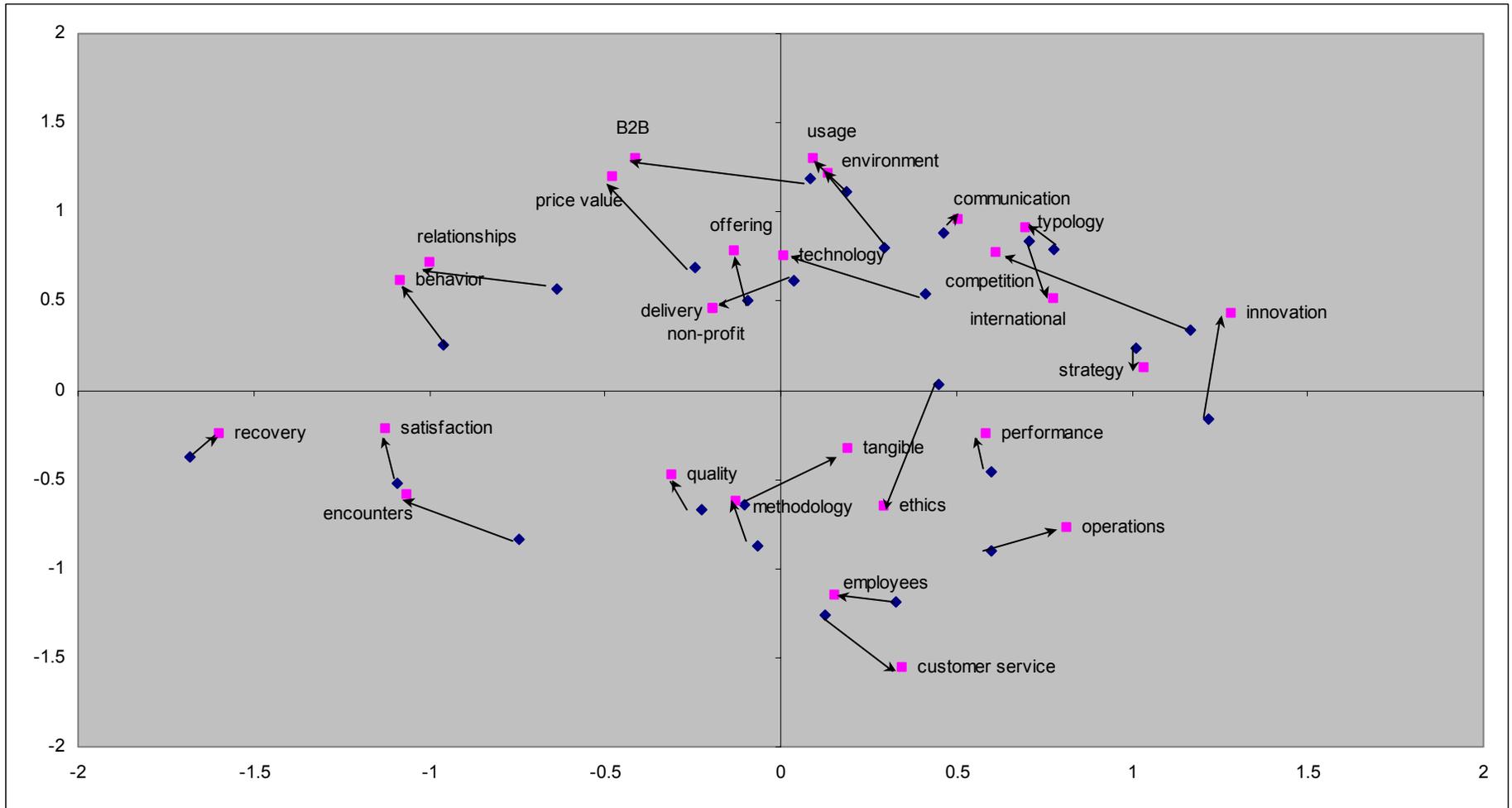
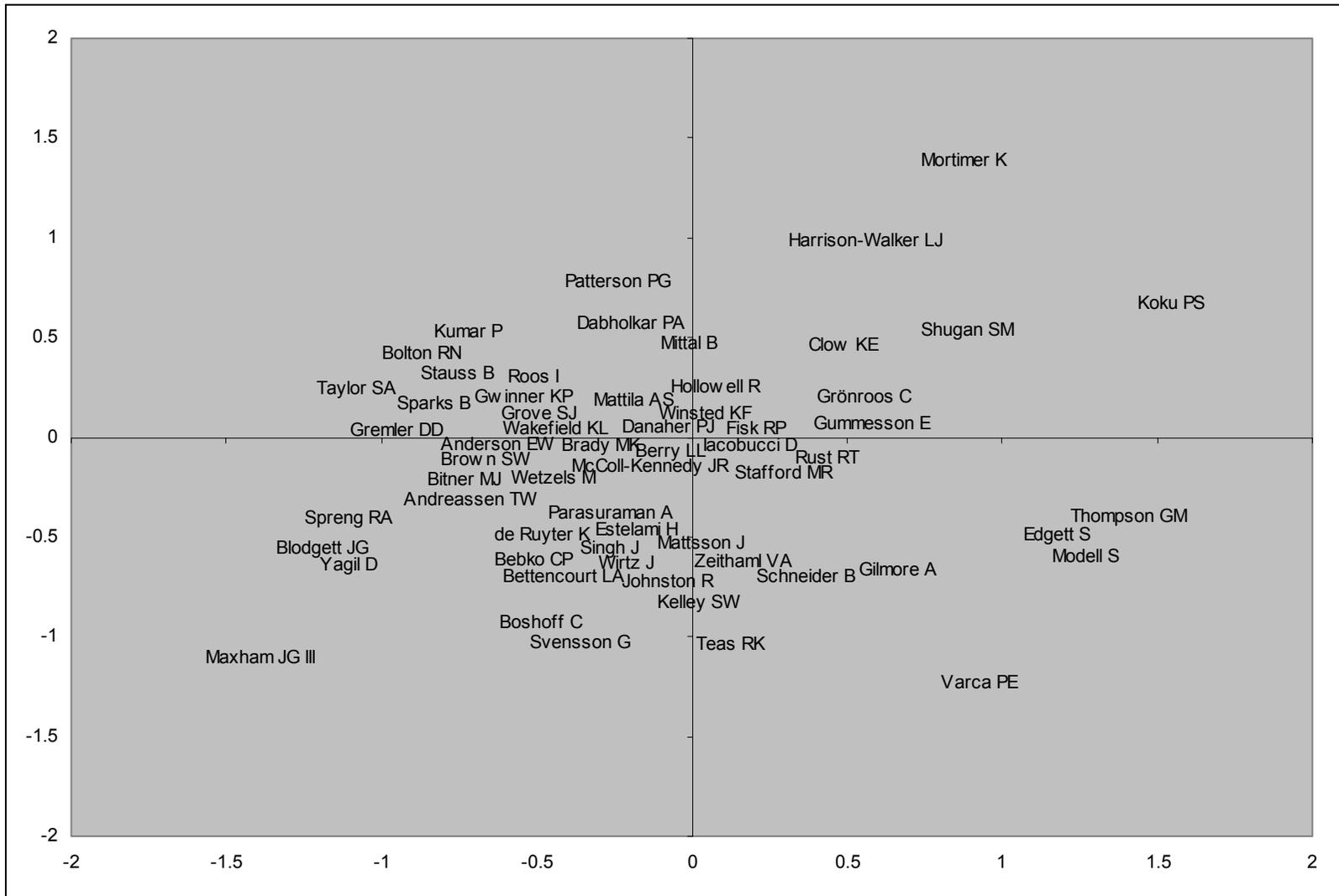


Figure 3: Most Prolific Authors: 1993-2003



-
- ¹ Calculated using the method of average linkage between group centers, using SPSS.
- ² Like Ennis (1992), we used Kulczynski's similarity measure 2 (see SPSS). This measure yields the average conditional probability that a key word is present in one paper given that the key word is present in the other paper. The measure is an average over both papers acting as predictors. It has a range of 0 to 1 and is computed by the following formula: $\frac{a/(a+b)+a/(a+c)}{2}$. For a pair of key words, a is the number of papers containing both key words, b is the number containing the first key word but not the second, and c is the number containing the second key word but not the first.
- ³ MCA is an exploratory data analysis technique for the graphical display of multivariate categorical data (Hoffman and Franke 1986). It is an analysis of interdependence among a set of categorical variables that is similar to the principal component analysis (Hoffman, de Leeuw and Arjunji 1994). For a more detailed presentation of MCA, we refer the reader to the book by Lebart, Morineau and Warwick (1984). For applications of this techniques in business research, in particular in marketing, see Hoffman and Franke (1986) and Hoffman, de Leeuw and Arjunji (1994).
- ⁴ Calculated using SPSS' Homals.
- ⁵ Despite the considerable movement in position of some authors due to multi-authorship, rankings before and after adjustment are highly correlated. For the Top 60 authors listed in Table 2, the Spearman rank correlation between total and adjusted appearances equals .714, and the Pearson correlation equals .714. For all 1,048 authors, Spearman and Pearson equal .985. Each of these correlation coefficients implies a strong relationship between total and adjusted appearances.