The perilous world of management fashion: A re-examination of their life cycles

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Abstract

This study examined the life cycles of seven popular management fashions. Past research has confirmed that life cycles of such programs exhibit a bell-shape, based on article plots, also known as bibliometric or citation analysis studies. This study sought to determine if such plots follow a normal distribution. In addition, we looked at the patterns of articles appearing in trade journals vs. articles appearing in scholarly journals. The results indicate only partial support for a normal distribution of management life cycles. However, a strong correlation was found between trade and scholarly publication patterns.

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Management fashion refers to popular programs used in organizations to improve performance. Examples abound of such programs and include management by objectives (MBO), quality circles, benchmarking, sensitivity training, and total quality management (TQM). The academic inquiry on management fashions is growing. For example, we know that most fashions exhibit a life cycle (Carson, Lanier, Carson, Birkenmeier, 1999; Spell 1998). We also know that life cycles can be tracked via the proxy of article publications (Abramson & Fairchild, 1999). The source of publications has also been studied to a limited extent. In general, publications from practitioner outlets surpass the number of publications in academic outlets (Abrahamson, 1996).

What is less known are the nature of life cycle characteristics that management fashions display. For example, do all life cycles display the traditional inverted U shape, or do variations exist? Also, what are the reasons that scholarly articles lag behind the practitioner articles in terms of total number of publications? Are we to imply that academics just are not as interested in management fashion?

This paper focuses on the topic of management fashion life cycles and the dilemma of scholarly lag effects. We begin by over viewing the area of management fashion and the existence of life cycles within these fashions. Next, we examine the life cycles of seven popular management programs. The paper concludes with implications for researchers and practitioners.

Background

Management fashions consist of the fads and programs that managers implement in their organizations in order to increase effectiveness. Although various formal definitions of fashions are available, the one offered by Carson and associates is well cited: "…managerial interventions which appear to be innovative, rational, and functional and are aimed at encouraging better organizational performance," (Carson, et al, 1999: 320). Examples abound, and include such programs as total quality management (TQM), just in time (JIT), activity-based costing (ABC), and Six Sigma. A number of characteristics of fashions have been recognized in the literature. The following list summarizes the major characteristics of a management fashion.

- The management fashion is presented as a radical departure from current practice, and is therefore, superior to current practice (Abrahamson, 1991; Keiser, 1997; Ryan & Hurley, 2004). The rationale of advocating such departures is that the old management programs of yesteryear are no longer applicable; new ones must take their place.
- The management fashion is perceived to be innovative, rational, and functional (Abrahamson & Fairchild, 1999; Carson, Lanier, Carson, & Guidry, 2000). With these qualities, the rational manager should find such fashions appealing.
- The management fashion is focused on improving organizational effectiveness (Carson, Lanier, Carson, & Guidry, 2000; Gibson & Tesone, 2001). Since managers are compensated by how well they operate their organizations, the rational model of seeking such fashions is understandable (Abrahamson, 1996). This mindset draws its roots from institutional theory, which purports that in response to the demands of

stakeholders; managers seek to run their organizations in a rational manner (Scott, 1994; Spell, 2001).

- The management fashion is destined to help decision makers cope with organizational problems (Abrahamson, 1996; Huczynski, 1993). For example, TQM and Six Sigma address quality concerns, while JIT and lean production address inventory problems. Pascale (1991) looked at a number of management fashions that addressed specific organizational problems during the 1980s such as foreign competition and the quality of goods and services.
- The value of the management fashion is temporary. Peters & Waterman (1982) were one of the first to recognize that management programs (fashions) have life cycles. Generally, fashions create value to an organization for a set period of time, and then, are either absorbed into the management philosophy of the company, or abandoned altogether.

Some writers make a distinction between management fads and management fashions. Fads are viewed as being more short-term in their life cycles, generally peaking in about 5 years, and then rapidly dropping off in interest among practitioners and academics (Ponzi & Koenig, 2002; Ryan & Hurley, 2004). Fashions on the other hand are more enduring, with interest among practitioners and academics taking place over an extended period of time. Longer-term interventions come under the category of fashions, but alternatively, some have labeled these as "trends" (Letscher, 1994). Interventions that become entrenched in the culture and operating philosophy of the organization earn the label of "collective wisdom" (Rifkin, 1994). For the remainder of this paper, we will refer to all aforementioned programs as management fashions.

The Origin of Management Fashions

Several viewpoints exist on how management fashions originate. Abrahamson (1996) proposed that fashions are created by "management fashion setters" who advocate their interventions to the practicing management community. In other words, it is not managers themselves who create the fashions, but the business schools, management consultants, and business organizations who then sell these programs to management (Abrahamson, 1991; Fink, 2003; Meyer, 1992; Strang & Meyer, 1994).

Of course, an alternate viewpoint is that managers themselves create fashions in order to solve a specific operating problem. Western Electric developed statistical process control (SPC). Toyota developed the Toyota Production System that later became know as JIT. Motorola adapted earlier quality programs to pioneer the Six Sigma movement. Many programs originated with an author(s) who wrote a seminal piece, or a company that was the first to implement the program. Some examples include:

- Just-in-Time (JIT) – (Schoenberger, 1982)
- Lean manufacturing– (Womack & Jones 1996)
- Business process reengineering (BPR) – (Hammer & Champy, 1993)
- Mass customization – (Pine, 1993)
- Activity based costing (ABC) – (Cooper & Kaplan 1988; Brimson 1991)
- Six Sigma – GE and Motorola (Pande, Neuman, & Cavahagh, 2000).

Management fashion life cycles

The life cycle shape. Perhaps the most common point that researchers agree on is that management fashions follow a life cycle (Abrahamson, 1996; Carson, et. al., 1999; Carson, et. al., 2000; Crainer, 1998; Ettore, 1997; Fink, 2003; Gibson & Tesone, 2001; Gill & Whittle,

1992; Spell, 2001). There is less agreement about the nature of these life cycles. When describing the pattern of the life cycle curve, some writers have purported a bell shape as being the most common cycle form (Abrahamson, 1996; Spell, 2001). However, Ponzi & Koenig (2002) have indicated an S-shape as being the more prevalent pattern. Carson and associates (2001) acknowledge that shapes will vary in terms of slope rates because of the existence of other management fashions on the market that may impact the particular fashion under study. However, a shape of some kind is plausible, most likely one that resembles a bell curve.

The above studies use bibliometric data in assessing the shapes of management fashions. This technique uses article counts on a particular fashion as a proxy for the generated interest of that fashion among management scholars, practitioners, and consultants. Bibliometric studies plot the data and the resulting curves become easy to discern. This form of data analysis is a widely used tool in the research of fashion life cycles (Carson, et. al., 2000). A bell shape curve would show the fashion generating few articles at first, but then as time elapses and the fashion grows in interest, a positive slope would emerge as the number of articles increases. At some point, the number of articles will eventually level off, and then decrease, an indication of less interest in that management fashion. The result is a negative sloping curve that eventually tapers off to near zero.

Life cycle stages. In addition to the shape of the life cycle, the stages of the life cycle are also of interest. The widely cited model by Ettore (1997) shows fashions progressing through a five-stage life cycle:

1. Discovery – "A buzzword is born". This is the stage where the new fashion gains recognition in the market.

2. Wild Acceptance – "The idea catches fire". The number of adopters of the fashion increases dramatically.
3. Digestion – "The concept is subject to criticism". At this stage, users and non-users such as academics will begin to question and critique the merits of the fashion.
4. Disillusionment – "The idea does not solve all problems". Shortcomings of the fashion become readily apparent. Interest and adoption decreases.
5. Hard Core – "Only true believers remain." Interest in the fashion is limited, with only a few adopters still practicing the remnants of the program.

Although writers cite this model frequently in the management fashion literature, it was originally written in a practitioner outlet and therefore, not empirically tested.

Although a number of studies have indicated that management fashions follow a predictable bell shape curve, these studies rely on visual plot patterns to make their assessment. None actually empirically tests for a bell shape curve. A test for a normal distribution on a program that is nearing the end of its publication life cycle will confirm the existence of a bell shape curve. The rationale for knowing the existence of a specific curve helps determine the ultimate stage of the life cycle that the management fashion is in, or has been in. Hence, looking at time series data, the life cycle and the stage and corresponding years of the life cycle can be identified. In addition, some life cycle curves will not necessarily appear as a bell shape. In these cases, the curve may double dip, that is, appear to peak, then take a downswing, followed by another upswing. Such a pattern would not indicate a normal distribution curve and may indicate that the life cycle is not yet complete. Such double dips may also signal changes that have occurred in the external environment.

Hypothesis 1 – Management fashions that are nearing the end of their life cycle will exhibit a normal distribution curve based on the total number of articles published.

The role of Academic Scholarship in Management Fashion

"Journals exist to disseminate scholarly knowledge" (Amason, 2005: 157). This statement upholds the traditional view of academic research, to lead the market with new ideas on how to run effective organizations. Yet, an interesting debate emerges when one analyzes the current status of management fashion inquiry. Abrahamson (1996) made a rather blunt indictment of the academic community in their quest to lead the market with new ideas; "Fashion setters who fall behind in this race (e.g., business schools or certain scholarly professional societies) are condemned to be perceived as lagging rather than leading management progress, as peripheral to the business community, and as undeserving of societal support", (Abrahamson, 1996: 255). In an earlier study on this issue, Barley, Meyer, & Gash, (1988), found that the popular management press tends to lead in generating ideas about what is useful in management, with academics lagging behind. Later writers have acknowledged the existence of this lag (Carson, et. al., 1999; Spell, 2001)

There is some speculation on why this lag exists. One school of thought suggests that the lengthy peer review process and the high rejection rates may be a factor (Spell, 2001). An alternate viewpoint suggests that industry drives academic research; hence, it is the practicing manager that originates the fashion and not the management scholar (Barley, Meyer, & Gash, 1988; Galbraith, 1980; Spell, 2001). Helping this trend along is the observation that the popular business press is particularly adept at communicating management fashions in a clear, less formal manner, thus, increasing its appeal to managers (Mazza, 1998). Still another viewpoint

suggests that the purpose of scholarly research on a management fashion is not to create it, but to critique it (Carson, et. al., 1999). Consequently, this so called lag is not caused by indifference on the part of management scholars (Abrahamson, 1996), but is a natural by-product of what scholars are called to do – to critically examine fashions and weigh them on their true merits, not on the marketing skills of a management guru.

The lag can be further illustrated by comparing article counts on a particular management fashion with the type of publication outlet that writes about it. This viewpoint accepts the premise that the more popular a fashion is, the more it will be written about as a proxy for its acceptance (Abrahamson, 1996). Trade journals and magazines can be seen as an indicator of practitioner interest and acceptance of a management fashion. Academic journals serve as an indicator of the management scholar's interest in a fashion. The word interest is used here, but not acceptance, since scholars may be critiquing the fashion (Carson, et. al., 1999), but not necessarily endorsing it.

To summarize, two viewpoints help to explain scholarly lag effects: 1) the lengthy peer review process, and 2) the observation that management fashions originate in the practitioner marketplace, not the academic arena. We propose that these two viewpoints are not necessarily mutually exclusive, but actually work together to create the "illusion" of a lag effect. We use the word illusion to point out that the term lag has a negative connotation when applied to academics and their publication records on management fashion. The implication so far is that management scholars lag because they are either incapable of creating new knowledge, or have no interest in management fashions, preferring to retreat into their ivory towers to write about theories that are not of interest to the practitioner. An alternate viewpoint suggests that this lag effect is only an illusion, and that academics write less than the popular business writers for two reasons: 1) the

lengthy peer review process and high rejection rates act as a gatekeeper to higher numbers of articles appearing on a given management fashion; and 2) the role of the management scholar is not to advertise the merits of a fashion, but to critically evaluate its merits.

We proposed in hypothesis 1 that management fashions will show a bell shape life cycle based on their publication frequencies. Likewise, the articles written in trade journals and the articles written in scholarly journals should also show two distinct, yet similar patterns. The so-called lag effect implies that the trade journal curve will be larger than the scholarly journal curve in the early stages of the program's life cycle. However, both curves should be similar in shape, that is, they should both resemble a normal distribution curve. If the scholarly journal curve is similar to the trade journal curve, then the assumption could be made that interest in that management fashion among practitioners and academics is similar.

Hypothesis 2a – The trade journal curve and the scholarly journal curve will both display a normal distribution in management fashions that are nearing the end of the life cycle.

Hypothesis 2b – Regardless of the shape of the management fashion curve (normal distribution or not), the trade journal curve and the scholarly journal curve will be correlated with each other.

Methodology

We use the number of articles written about a management fashion as a proxy for its popularity. This method has found support by those who research management fads and fashions (Abrahamson, 1991; Carson, et. al., 2000; Gibson & Tesone, 2001; Ryan & Hurley, 2004). Its continued use has also been advocated so comparisons with other similar studies can be made (Carson, et. al., 2000).

We chose ABI/INFORM Global, or ProQuest, as the article search engine because it lists references since the early 1970s, longer than any other search engine at our disposal. It accesses over 1,300 publications and further divides the citations into trade and scholarly sources.

Seven popular management fashions were tracked in this study. Five of the fashions are well documented and potentially near the end of their life cycles. These include activity based costing (ABC), just in time (JIT), materials resource planning (MRP), enterprise resource planning (ERP), and total quality management (TQM). Two of the fashions are still emerging in their visibility and popularity, lean manufacturing, and six sigma.

Results

The results are arranged by management fashion (see appendix A). Each fashion analysis displays a graph and two tables. Three curves are shown on the graph, the total number of articles published, the articles that were published in trade journals (an indication of practitioner interest in that fashion), and the articles published in scholarly journals. The first table under the graph gives the means, standard deviations, number of years measured, and item correlations. The second table indicates if each of the three curves on the graph display a normal distribution. A series of four tests were run on each curve. In order to test for the normality of data we performed the Shapiro-Wilk test, the Kolmogorov-Smirnov test, the Cramer-von Mises test, and the Anderson-Darling test. Under these tests the null hypotheses state that the data are normally distributed. The alternative hypotheses are that the data are not normally distributed. A p-value of 0.10 is associated with a 10% confidence interval. If the p-values are greater than 0.10, we cannot reject the null at any reasonable confidence level. In other words, p-values over .10 indicate the plots are normally distributed. For further details of these tests please see Judge et al. (1985). After the test results is a statement indicating if the curve was a normal distribution.

Hypothesis 1 – partially supported

Hypothesis 1a stated that management fashions near the end of their life cycle will display a normal distribution. Two of the five fashions, ABC and JIT, had normal distributions based on their total article counts. One fashion, ERP, had marginal support for a normal distribution. The other two fashions, MRP and TQM did not adhere to a normal distribution curve. Note, lean manufacturing and six sigma were not considered in this hypothesis since their life cycles are still peaking.

Hypothesis 2a – partially supported

Hypothesis 2a stated that the trade journal curve and the scholarly journal curve will both display a normal distribution in management fashions that are nearing the end of the life cycle. Two of the five fashions met this criteria, ABC and JIT. For the reasons stated above, lean manufacturing and six sigma were not included in this part of the analysis.

Hypothesis 2b – supported

Hypothesis 2b stated that regardless of the shape of the life cycle curve, the trade journal and scholarly journal curves would be correlated. Six of the seven total fashions showed high correlations in this area. The correlations for the different fashions were as follows, ABC (.68), JIT (.77), MRP (.64), TQM (.68), lean manufacturing (.59), six sigma (.97). There was no correlation between trade and scholarly journal cycles for ERP (-.02).

Discussion

We offer the following observations linking life cycles with management programs. The question about the normal curve characteristics of life cycles remains unresolved. While two met the tests for normality, three did not. Of the three that did not – MRP, TQM and ERP, there are additional considerations that may have an impact. MRP (materials requirements planning)

evolved into MRP II (manufacturing resource planning) during the 1980s. This may have caused redundancy or substitution of terms that distorted the article counts. It has certainly caused looseness in the use of the term in practice. Only a more thorough analysis of individual articles would discern their true program intent.

TQM is a program that also requires more detailed analysis. The number of articles, both trade and scholarly, peaked in 1994 in a frenetic wave of interest. We believe that this coincided with the widespread interest in extending the quality movement into the area of services, such as banks, insurance companies, and the like. As an observation, these TQM programs were heavy on "soft" techniques but lacking in hard, or quantitative, techniques. At any rate, there are events that appear to have distorted the normality of the life cycle. It is also of interest that after this peak, scholarly articles became more numerous than trade publications. Even after trade publications dropped to almost zero, scholarly articles were still being published at a relatively high level. Quality is a topic that appears to have high interest for scholarly study.

ERP is a third program that experienced significant events that may have distorted its life cycle pattern. In 1998 and 1999, the business world was concerned with the "Y2K" expectations. The number of trade articles skyrocketed during this two-year period. There was also great interest in magazines and newspapers (not shown in the graphs). Scholarly articles were just beginning to make an appearance. As shown in the graph for ERP, trade articles appear to be nearing the end of their life cycle, while scholarly articles are still increasing. Our conclusion has to be that, while some programs appear to have a "normal" life cycle, significant events during a program's life can distort its publication pattern.

The relatively high correlation between trade and scholarly publications confirms that both communities share common interests as regards management fashions, albeit that scholarly articles tend to lag trade publications. The fact that scholarly articles may be larger than trade articles during the latter stages of the program's life cycle poses another interesting "Why?" Are scholars still discovering new insights that could be useful in future programs or spending time on interesting, but not very practical, research? Or are scholars critiquing the merits of these fashions?

Limitations of the study

The use of article citations as a proxy for tracking life cycles, although accepted in the literature, is not without its limitations. Ryan & Hurley (2004) point out that just because a management fashion is cited in the literature, it does not mean it is being advocated as a viable program. Likewise, the decline in the number of articles on a management fashion does not always mean the program has been dismissed (Swan, 2004). On the contrary, it may mean that the components of the fashion are now part of the established management practice of the organization (Gibson, et. al., 2001), and raising attention to the individual uniqueness of the fashion via publications is no longer necessary. For example, management by objectives (MBO), began in the 1950s and offered a radical departure from the top down approach to goal setting that had been in place prior to this period. Articles relating to the uniqueness and novelty of MBO are no longer necessary, but the practice of MBO is still widely advocated by organizations today (Gibson, et. al., 2001).

Second, this study looked at the publication of articles only, it did not assess the various other media that promote management fashions. For example, management gurus often publish their own books to describe new management fashions (Huczynski, 1993). Finally, counting the

publication of an article does not ascertain the nature of what was written in that article. The actual reading of an article is necessary to determine if the management fashion is viewed in a positive or negative light (Clark, 2004).

Conclusion

There is only marginal support for the existence of a normal distribution or bell curve among the programs studied in this paper. However, these results do not disprove that management fashions have life cycles, only that the nature of these life cycles may not fall into a neat pattern, such as those parameters set by a normal distribution. This study did reveal that the publication plots between trade and scholarly outlets are similar for each management fashion. The number of articles in trade outlets is usually greater than those in scholarly outlets. Future research should focus on determining the exact nature of these articles. For example, do trade publications advocate and advertise the application of these fashions? One might hypothesize that this would be the case, given the mission of many of these publications. On the other hand, do scholarly outlets critically reflect on the nature of these fashions?

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Appendix A

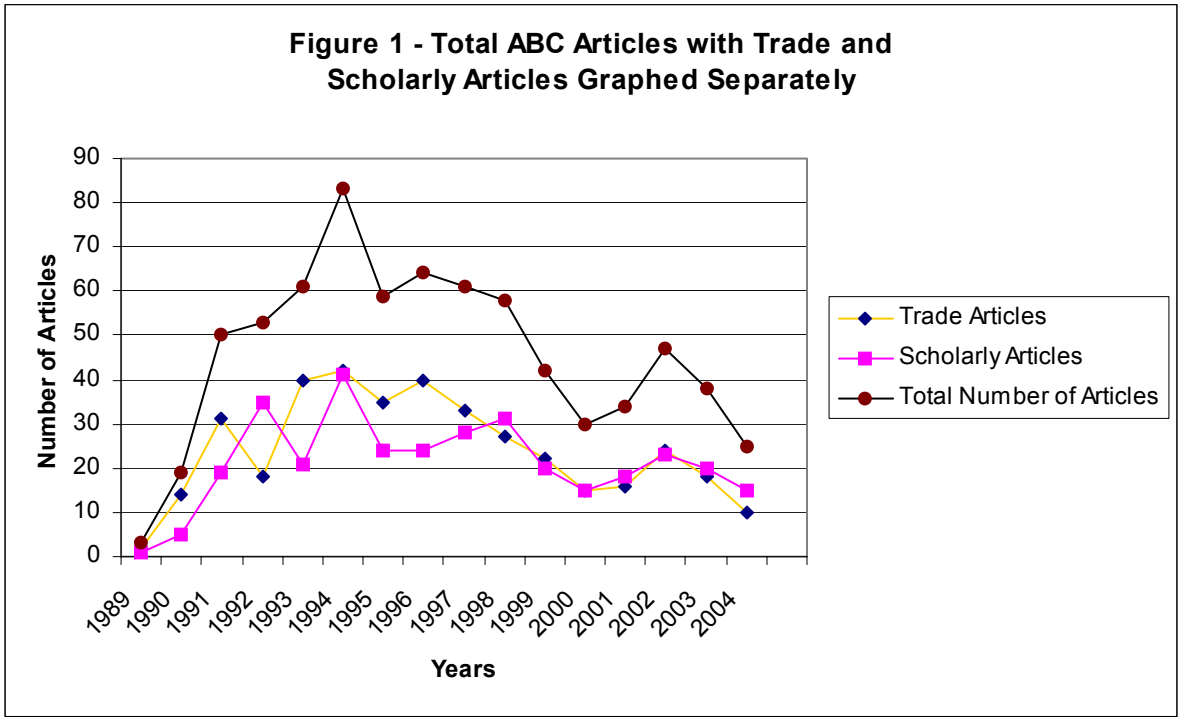

Table 1a: Correlations and Descriptive Statistics for ABC Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	45.44	20.03	16		
2. Trade Articles	24.19	11.82	16	.93	
3. Scholarly Articles	21.25	10.03	16	.90	.68

Table 1b: Tests for Normality for ABC Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.98	.94	.96	.67	.97	.81
Kolmogorov-Smirnov (D)	.11	.15	.14	.15	.14	.15
Carmer-von Mises (W^2)	.03	.25	.04	.25	.05	.25
Anderson-Darling (A^2)	.22	.25	.26	.25	.31	.25
Interpretation	Total article plot is a normal distribution		Trade article plot is a normal distribution		Scholarly article plot is a normal distribution	

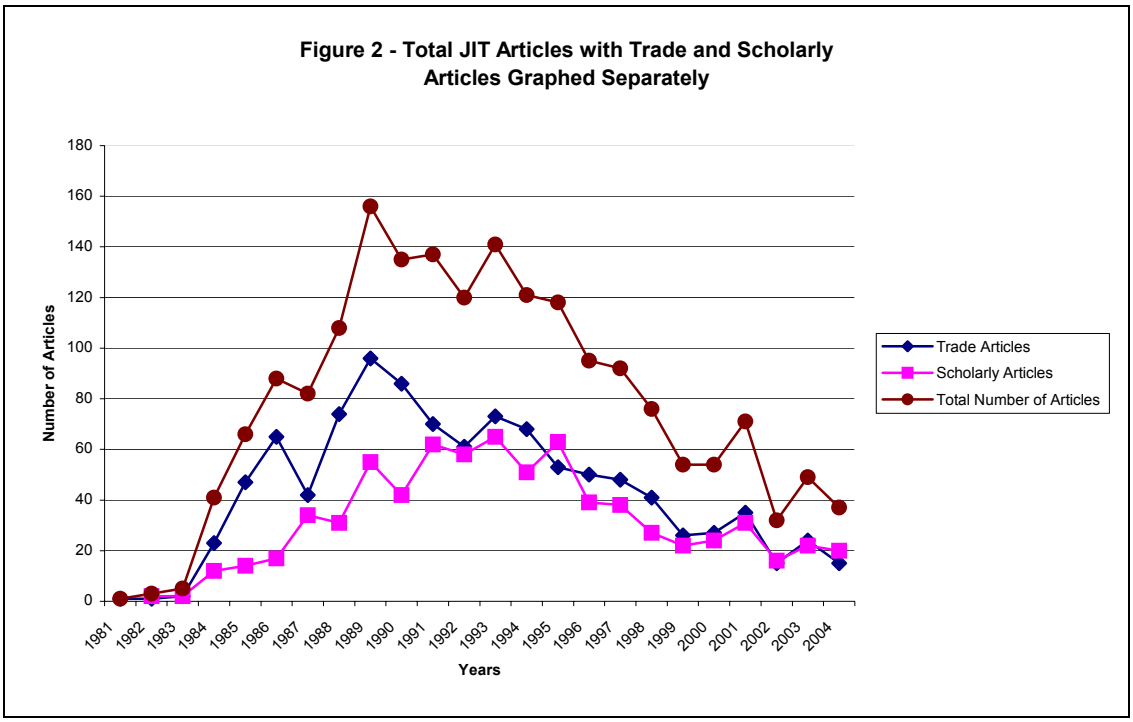

Table 2a: Correlations and Descriptive Statistics for JIT Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	74.58	44.69	24		
2. Trade Articles	43.46	27.20	24	.96	
3. Scholarly Articles	31.13	19.95	24	.92	.77

Table 2b: Tests for Normality for JIT Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.96	.43	.97	.61	.95	.26
Kolmogorov-Smirnov (D)	.11	.15	.10	.15	.10	.15
Carmer-von Mises (W^2)	.04	.25	.03	.25	.05	.25
Anderson-Darling (A^2)	.28	.25	.23	.25	.04	.25
Interpretation	Total article plot is a normal distribution		Trade article plot is a normal distribution		Scholarly article plot is a normal distribution	

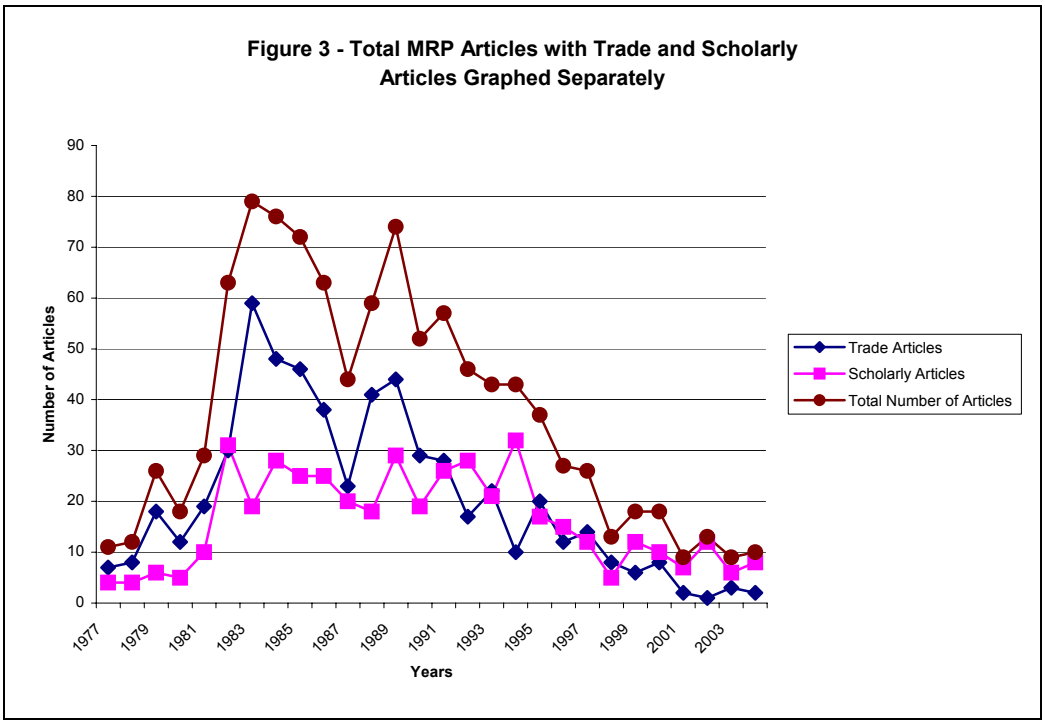

Table 3a: Correlations and Descriptive Statistics for MRP Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	36.75	23.00	28		
2. Trade Articles	20.54	16.04	28	.95	
3. Scholarly Articles	16.21	9.15	28	.84	.64

Table 3b: Tests for Normality for MRP Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.91	.02	.92	.03	.93	.05
Kolmogorov-Smirnov (D)	.15	.10	.13	.15	.14	.15
Carmer-von Mises (W^2)	.12	.07	.13	.05	.09	.15
Anderson-Darling (A^2)	.79	.04	.80	.04	.63	.09
Interpretation	Total article plot is NOT a normal distribution.		Trade article plot is NOT a normal distribution.		Scholarly article plot is NOT a normal distribution.	

Figure 4 - Total ERP Articles with Trade and Scholarly Articles Graphed Separately

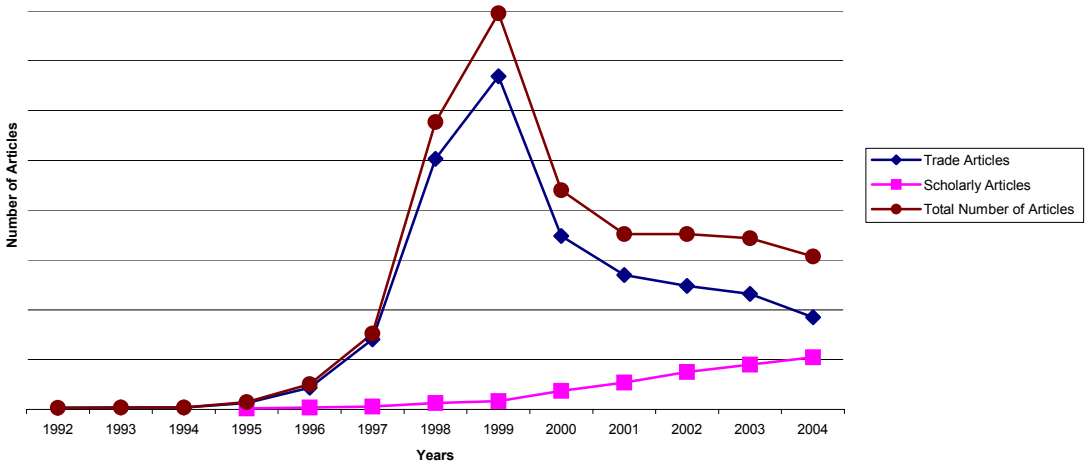

Table 4a: Correlations and Descriptive Statistics for ERP Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	235.92	220.37	13		
2. Trade Articles	204.92	208.21	13	.99	
3. Scholarly Articles	31.00	37.70	13	.17	-.02

Table 4b: Tests for Normality for ERP Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.89	.10	.88	.07	.81	.01
Kolmogorov-Smirnov (D)	.19	.15	.17	.15	.26	.01
Carmer-von Mises (W^2)	.09	.16	.08	.22	.18	.01
Anderson-Darling (A^2)	.56	.13	.54	.14	1.04	.01
Interpretation	Total article plot is only marginally a normal distribution.		Trade article plot is NOT a normal distribution.		Scholarly article plot is NOT a normal distribution.	

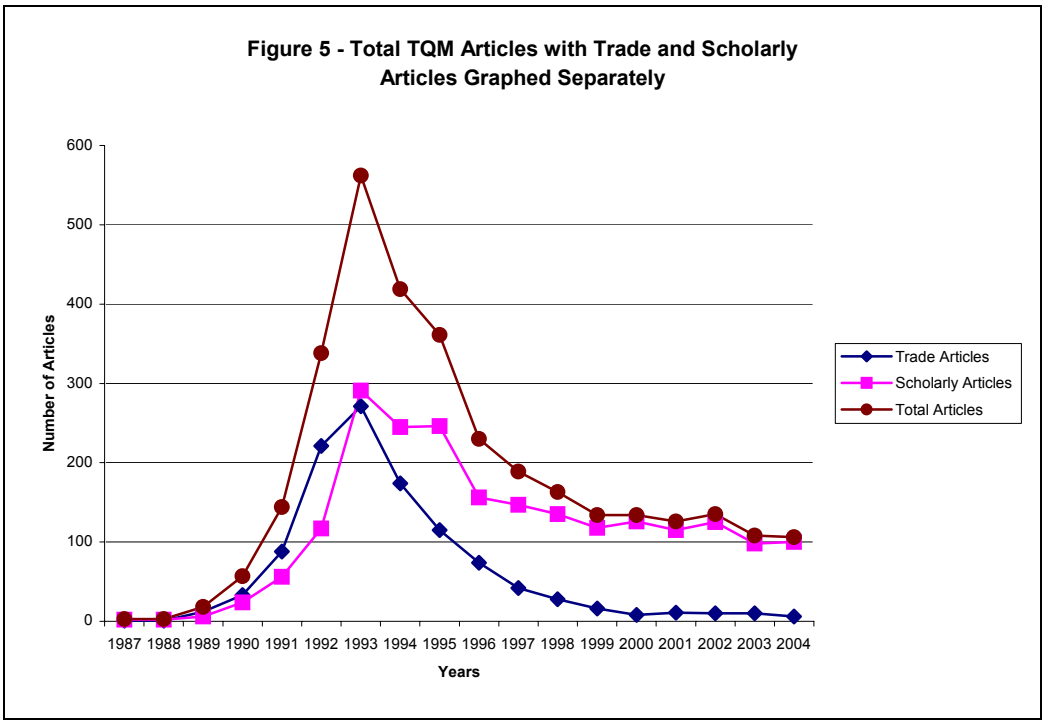

Table 5a: Correlations and Descriptive Statistics for TQM Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	179.44	151.23	18		
2. Trade Articles	62.28	81.76	18	.91	
3. Scholarly Articles	117.17	83.31	18	.92	.68

Table 5b: Tests for Normality for TQM Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.88	.03	.75	.00	.92	.14
Kolmogorov-Smirnov (D)	.21	.04	.26	.01	.15	.15
Carmer-von Mises (W^2)	.16	.02	.34	.01	.09	.13
Anderson-Darling (A^2)	.84	.02	1.84	.01	.57	.13
Interpretation	Total article plot is NOT a normal distribution.		Trade article plot is NOT a normal distribution.		Scholarly article plot is MARGINALLY a normal distribution.	

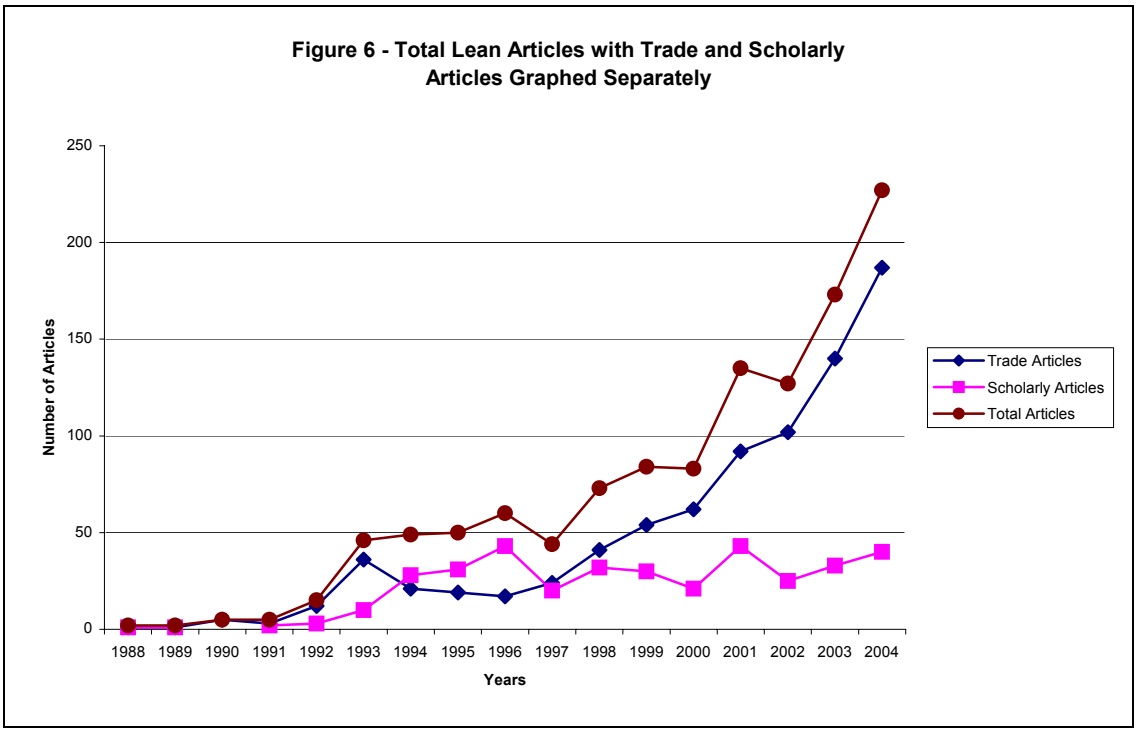

Table 6a: Correlations and Descriptive Statistics for Lean Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	62.16	64.34	19		
2. Trade Articles	43.05	52.60	19	.98	
3. Scholarly Articles	19.11	16.16	19	.73	.59

Table 6b: Tests for Normality for Lean Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.87	.01	.80	.00	.87	.01
Kolmogorov-Smirnov (D)	.17	.15	.22	.02	.21	.03
Carmer-von Mises (W^2)	.13	.04	.25	.01	.14	.03
Anderson-Darling (A^2)	.86	.02	1.40	.01	.90	.02
Interpretation	Total article plot is NOT a normal distribution.		Trade article plot is NOT a normal distribution.		Scholarly article plot is NOT a normal distribution.	

Figure 7: Total Six Sigma Articles with Trade and Scholarly Articles Graphed Separately

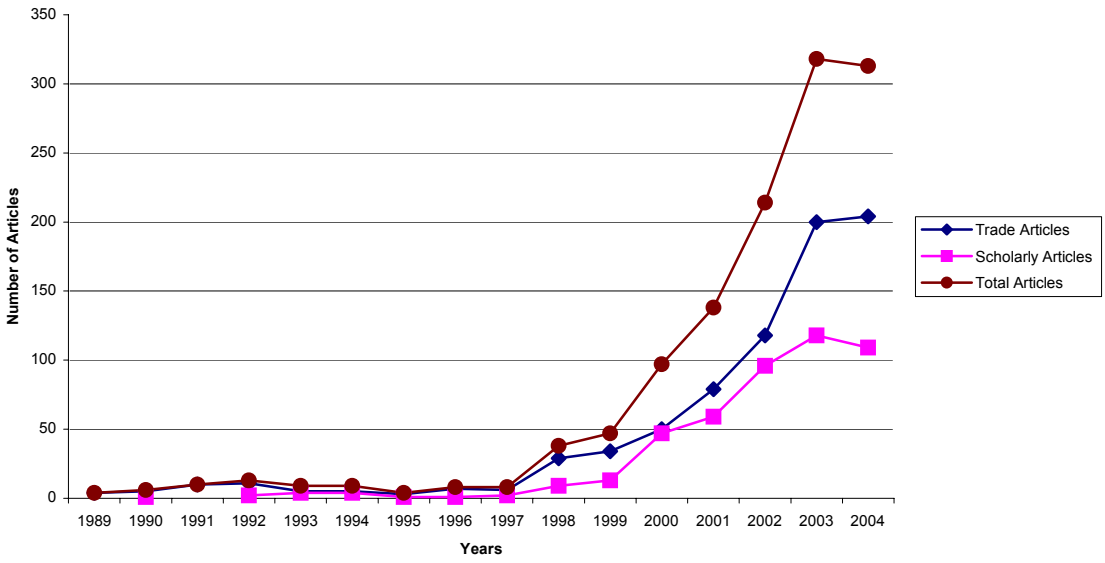

Table 7a: Correlations and Descriptive Statistics for Six Sigma Articles

Variable	Mean	s.d.	n	1	2
1. Total Articles	77.25	110.19	16		
2. Trade Articles	48.13	68.13	16	.99	
3. Scholarly Articles	29.13	42.76	16	.98	.97

Table 7b: Tests for Normality for Six Sigma Articles

	Total Number of Articles		Trade Articles		Scholarly Articles	
Test	Statistic	p-value	Statistic	p-value	Statistic	p-value
Shapiro-Wilk (W)	.70	.00	.69	.00	.70	.00
Kolmogorov-Smirnov (D)	.30	.01	.27	.01	.33	.01
Carmer-von Mises (W^2)	.40	.01	.37	.01	.40	.01
Anderson-Darling (A^2)	2.08	.01	2.05	.01	2.14	.01
Interpretation	Total article plot is NOT a normal distribution.		Trade article plot is NOT a normal distribution.		Scholarly article plot is NOT a normal distribution.	