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Politis, John D.

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The Relationship between Self-Leadership Behavioural-Focused Strategies, Job Satisfaction and Quality Function Deployment

John Politis
Dubai Men's College, United Arab Emirates
john.politis@hct.ac.ae

Abstract: The objective of this paper is to empirically investigate through an industry survey, the impact of self-leadership behavioural-focused strategies and job satisfaction on the determinants of quality function deployment (QFD). The paper also investigates the level of prediction of the determinants of QFD after having statistically controlled for the predictive affects of the self-leadership behavioural-focused measures. Results indicate that the majority of the self-leadership behavioural-focused strategies are positively and significantly correlated with the determinants of QFD. The findings also indicate that self-leadership behavioural-focused strategies are the only predictors of the QFD constructs, as the job satisfaction dimensions did not correlate with the determinants of QFD. Finally, it was found that the dimensions of job satisfaction do not enhance the level of QFD determinants after statistically controlled for the predictive affects of the self-leadership behavioural-focused strategies. The underlying themes of these findings are discussed.

Keywords: Behavioural focused strategies, empowerment, job satisfaction, quality function deployment, self-leadership, self-observation.

1. Introduction

Quality Function Deployment (QFD), often called the House of Quality, is another of those strangely-named methods that are literal translations of Japanese. QFD is "a method for developing a design quality aimed at satisfying the consumer and then translating the consumer's demands into design targets and major quality assurance points to be used throughout the production phase" (Akao, 1990). In other words, it addresses the customer requirements by listening to the 'voice of the customer'. Embedded in the Japanese culture, QFD ensures that everyone in the organisation works together to provide customers what they want (Guinta & Praizler, 1993) – hence, it can be viewed as team builder. Within the team building concept, teams become self-led and by extension satisfied (Cohen & Ledford, 1994; Wellins et al., 1990). Although job satisfaction has been investigated in the academic business literature for some time, very little work has been done on the self-leadership behaviour – employee satisfaction relationship and its influence on QFD in the Arab world.

The goal of this study is to empirically examine the impact of self-leadership worker behaviour and job satisfaction on the determinants of QFD. The study also explores the level of prediction of the QFD determinants after having statistically controlled for the predict affects of the job satisfaction measures. The study involves a questionnaire-based survey of self-managed employees who are engaged in quality management programs from large organisations in the United Arab Emirates (UAE).

2. Literature review

2.1 Determinants of quality function deployment

Quality function deployment (QFD) fits into the broader framework of Total Quality Management (TQM). It was developed by Akao in Japan in 1966 and by 1972 the power of the approach had been well demonstrated at the Mitsubishi Heavy Industries Kobe Shipyard (Sullivan, 1986). In Akao's words, "... QFD is a way to assure the design quality while the product is still in the design stage." As QFD addresses the customer requirements (i.e. 'voice of the customer'), when appropriately applied, QFD has demonstrated the reduction of development time by one-half to one-third (Akao, 1990). Due to its superb performance improvements, QFD has been successfully used in a wide variety of organisations (Menon, et al., 1994), and it is deeply integrated into our commercial industry culture (Wollover, 1997). Although in a recent empirical study QFD

determinants were positively related to creativity and productivity (Politis, 2005a), it is difficult to understand what stimulates the successful implementation of QFD. Particularly, it is rather difficult to identify the underlying dimensions – individual and/or organisational – that advance QFD implementation, and even it is more difficult to measure the dimensions of work environment that have been suggested as being essential to QFD implementation. Politis (2003) has drawn on the literature of TQM and *Kaizen* and developed an instrument (scales) which assesses work environment determinants conducive to QFD implementation. The definitions of these determinants have been adopted from Politis (2003 pp.181-82):

- *QFD strategic planning*, so that the company sets strategic directions and action plans to support QFD methodologies;

- *customer and market focus*, so that the company determines customer requirements, expectations and build customer relationships for their satisfaction;

- *QFD information and analysis*, so that the company selects information systems that support strategic planning;

- *human resources focus on QFD*, so that the company enables employees to develop and utilise their full potential to effectively deliver value to the customer;

- *top management commitment to QFD*, so that management demonstrates its commitment to QFD by providing human and capital resources;

- *QFD training to supervisors* so that there is a breakdown of barriers between ranks, and participation exist between supervisors and other levels to enhance the quality of training and quality efforts; and

- *worker-supervisor collaboration in QFD efforts* so that there is a collaboration between workers and supervisors to solve quality problems.

Politis's scales of QFD were included in the research model of this study.

2.2 Job satisfaction QFD

When people speak of employee attitudes, more often than not they mean job satisfaction. Job satisfaction is in regard to one's feelings or state-of-mind regarding the nature of their work. Job satisfaction can be influenced by a variety of factors such as the quality of one's relationship with hers/his supervisor, the quality of the physical environment in which they work and the degree of fulfilment and autonomy in their work (Robbins, 2003). Job satisfaction has been defined as:

> *"An attitude that individuals have about their jobs. It results from their perception of their jobs and the degree to which there is a good fit between the individual and the organisation" (Ivancevich, Olelelns & Matterson, 1997, p. 91).*

In relation to TQM and QFD, the gurus of quality management, Deming and Juran, share the view TQM is a historically unique approach to enabling an organization to stay in business, so that it can promote the stability of the community, generate products and services that are useful to customers, and provide a setting for the satisfaction and growth of organisation members (Juran, 1969; Deming, 1986). Ishikawa (1985) even goes further saying that "an organisation whose members are not happy and cannot be happy does not deserve to exist" (p. 27). It is implied in these sentences that employees are satisfied as long as organisation exist in a complex, turbulent and extremely competitive environment. Hence, it is assumed that if organisations embark on TQM programs and by extension into QFD, they will be able to stay in business and in turn will be able to provide job satisfaction and growth to their employees. This connection is expressed in the following hypothesis.

> *Hypothesis 1: Correlations between each of the QFD constructs (i.e. QFD strategic planning; customer and market focus; QFD information and analysis; human resources focus on QFD; top management commitment to QFD; QFD training to supervisors; and worker-supervisor collaboration in QFD efforts) will be positively related to job satisfaction measures.*

As job satisfaction has deep roots in various theories of motivation (Dunford, 1992), and considering there are numerous studies supporting the connection between subordinate's satisfaction and performance (Seers & Graen, 1984; Cordery, Mueller, & Smith, 1989; Kirkman & Rosen, 1996), it is reasonable to predict that job satisfaction would increase the level of prediction of the QFD determinants, after statistically controlled for the self-leadership behavioural-focused strategies. This prediction is expressed in the following hypothesis

> *Hypothesis 2: The statistical prediction of the QFD determinants will be increased with the addition of the job satisfaction in the set of predictor variables.*

2.3 Self-leadership behaviour job satisfaction

The literature clearly attests that self-leadership to a large extent overlaps with self-management because of their common theoretical background (Manz, 1992). Self-leadership addresses high-powered, right brain activity, and lays the foundation for effective self-influence and continuous improvement. The literature suggests three distinct categories of self-leadership influence succeeding outcomes: behavioural-focused strategies; natural reward strategies; and constructive thought pattern strategies (Manz, 1986, 1992). In relation to the behavioural-focused strategies, Manz has developed a theory, which goes beyond the Bandura's (1977, 1982) work of self-control. Manz's (1992) self-leadership (behavioural-focused) theory is an expanded 'self-leadership' perspective that views employees as possessing an internal self-control system (Manz, 1979) and engages in self-evaluation processes; self-administer rewards and punishments in managing their daily activities (Bandura, 1977; Mahoney and Thoresen, 1974; Manz & Sims, 1980). Manz (1992) self-leadership theory focuses on six strategies, namely self-observation, cueing strategies, self-goal setting, self-reward, self-punishment, and practice. The definitions of these strategies have been adopted from Manz's (1992, pp. 19-21).

- *self-observation* describes the extent to which employees can (or try to) keep track of the progress of their work, or are aware of their own work performance.

- *cueing strategies* represent the extent to which employees use physical cues to remind themselves of their important tasks.

- *self-goal setting* represents the extent to which employees provide self-direction using personal goals.

- *self-reward* represents the extent to which employees influence themselves using rewards at both a physical and mental level.

- *self-punishment* represents the extent to which employees correct their undesirable behaviours through the feeling of guilt when they fail to do something.

- *practice* represents the extent to which employees improve themselves through the process of practicing an activity before performing it.

Among the plethora of writings on the topic of self-management and self-leadership it is acknowledged that there is an important connection between self-management leader behaviour and job satisfaction (Cohen, Ledford & Spreitzer, 1996). However, one study in Australia specifically examined the influence of self-leadership behavioural-focused strategies on job satisfaction. Politis (2006) found that the Manz' (1992) self-leadership behavioural-focused strategies positively influenced both intrinsic and extrinsic job satisfaction. It is therefore reasonable to assume that the factors representing self-leadership behavioural-focused strategies will be positively related to the factors of job satisfaction in the UAE. This relationship represents the following hypothesis.

> *Hypothesis 3: Self-leadership behavioural-focused strategies will have a direct, positive effect on the level of job satisfaction.*

2.4 Self-leadership behavioural-focused strategies QFD

In addition to the job satisfaction, the work environment determinants conducive to QFD implementation are shown to be linked to the management practices that involve human interaction and encourage participative decision making (Politis, 2003), and by extension to self-management leadership (Manz & Sims, 1987). Although there is no direct empirical evidence suggesting a

relationship exists between self-leadership behavioural-focused strategies and QFD, there is sufficient evidence arguing that there is a relationship between various leadership styles and the determinants of TQM/QFD (Bass, 1990; Hater & Bass, 1988). In particular, Politis (2003) found that the leadership styles of self-management, transformational leadership and initiating structure have a positive influence to at least some of the QFD determinants. As these leadership styles and Manz's (1992) self-leadership behaviours have emerged from a common theoretical background, it is reasonable to assume that self-leadership behavioural-focused strategies will be related to QFD determinants. This assumption is expressed in the following hypothesis.

> *Hypothesis 4: Correlations between each of the QFD constructs (i.e. QFD strategic planning; customer and market focus; QFD information and analysis; human resources focus on QFD; top management commitment to QFD; QFD training to supervisors; and worker-supervisor collaboration in QFD efforts) will be positively related to self-leadership behavioural-focused strategies.*

3. Sample and procedures

3.1 Sample

The sample was drawn from organisations listed in the Department of Economic Development (DED) in Dubai, United Arab Emirates. The DED offers Quality Awards to organisations which have embarked on a wide range of quality management programs, such as, TQM, ISO 9000 and *Kaizen*. Thus, the majority of participants have been trained to reflect leading contemporary practices in the field of TQM (http://www.dqa.ae/DQA/gn/PastWinners/). The sample consisted of members of non-unionised employees closely linked to operations of aluminium products, communications industries, electricity and water and transport. All respondents were full-time employees of the participating organisations and volunteered to participate in the study. Questionnaires, written in English, containing items measuring the variables of self-leadership behavioural-focused strategies, job satisfaction and the determinants of QFD were distributed to 205 employees of the participating organisations. A total of 146 employees returned usable questionnaires; yielding a 71.2 percent response rate. Fourteen incomplete questionnaires were excluded from the final sample.

The majority of the respondents were within the 21-35 age group (73.8%). Given the relative young age of the sample, the level of work experience is accordingly low. Eighty two percept (82.2%) of the respondents have had seven or less years of work experience. The respondents were 11 percent female and 86 percent male; 3 percent did not report their gender. All had attained a technical school or college qualification taught in the English language. Anonymity was guaranteed and no names or other identifying information was asked.

3.2 Analytical procedure

Confirmatory factor analyses (CFAs) were performed using the analysis of moment structures (AMOS, version 5) software (Arbuckle, 2003) for the factor analysis of the measurement models. Using CFAs, we assessed the validity of the measurement models of the variables used in the paper. A mixture of fit-indices was employed to assess the overall fit of the measurement models. The ratio of chi-square to degrees of freedom (χ^2/df) was computed, with ratios of less than 2.0 indicating a good fit. However, since absolute indices can be adversely effected by sample size (Loehlin, 1992), four other relative indices, i.e. the goodness-of-fit (GFI), the adjusted goodness-of-fit (AGFI), the comparative fit index (CFI), and the Tucker & Lewis index (TLI), were computed to provide a more robust evaluation of model fit (Tanaka 1987; Tucker and Lewis, 1973). For GFI, AGFI, CFI and TLI, coefficients closer to unity indicate a good fit, with acceptable levels of fit being above 0.90 (Marsh, Balla & McDonald, 1988). For root mean square residual (RMR) and root mean square error approximation (RMSEA), evidence of good fit is considered to be values less than 0.05; values from 0.05 to 0.10 are indicative of moderate fit and values greater than 0.10 are taken to be evidence of poorly fitting model (Browne & Cudeck, 1993).

If the CFAs of the measurement models indicate that the values of the fit indices are equal to or greater than the recommended values (i.e. demonstrate adequate validity and reliability), we accepted these models as the best fitting models.

4. Results

As noted earlier, the variables measured in the survey are the self-leadership behavioural-focused strategies, job satisfaction and the determinants of QFD, as rated by the employees, of the participating organisation.

4.1 Measurement models

Independent variables. Self-leadership behavioural-focused strategies were assessed using Manz's (1992) 18-item questionnaire. The theory posits six dimensions of self-leadership behaviour (i.e. self-observation, cueing strategies, self-goal setting, self-reward, self-punishment, and practice). The instrument employees a 5-point response scale (1 = does not describe me at all; 5 = describes me very well). A CFA of all 18 items was conducted to check for construct independence. Based on the results of a CFA supporting four first order factors, these items were used to create four scales: self-practice/reward (α = 0.80), self-goal setting (α = 0.78), self-observation (α = 0.72), and self-punishment (α = 0.70). (Note: three items were dropped due to cross loading.) The four first order factors will be used in the path model analysis.

Job satisfaction was assessed using Warr, Cook and Wall's (1979) 15-item job satisfaction scale (JSS). Among the plethora of job satisfaction instruments the selection of Warr *et al.*'s (1979) job satisfaction scale is justified for a number of reasons: *first*, the questionnaire is easy to complete by unsophisticated respondents and its psychometric properties are acceptable. *Second*, the scale has been previously tested on a sample of blue-collar workers (Warr *et al.*, 1979), which generally satisfies the population of this study. *Third*, it is short and it is easy to administer. *Finally*, its scoring is simple. Responses to the 15 items were made on seven-point scale (1 = definitely satisfied; 7 = definitely dissatisfied). JSS measures two distinct job satisfaction variables: intrinsic job satisfaction and extrinsic job satisfaction. Based on the results of a CFA supporting two first order factors, these items were used to create two scales: intrinsic job satisfaction (α = 0.85), and extrinsic job satisfaction (α = 0.73). (Note: three items were dropped due to cross loading.) The two first order factors will be used in the path model analysis.

Dependent variables. Quality function deployment constructs were assessed using Politis's (2003, pp. 191-192) 45-item instrument for measuring the underlying dimensions conducive to QFD. The instrument posits seven constructs, namely, QFD strategic planning, customer and market focus, QFD information and analysis, human resources focus on QFD, top management commitment to QFD, QFD training to supervisors, and worker-supervisor collaboration in QFD efforts. Responses to the 45 items were made on seven-point Likert scale (1 = strongly agree; 7 = strongly disagree). We conducted CFA of all QFD items in order to check for construct independence. Based on the results of a CFA supporting seven factors, these items were used to create seven scales: QFD strategic planning (α = 0.91), customer and market focus (α = 0.93), QFD information and analysis (α = 0.88), human resources focus on QFD (α = 0.80), top management commitment to QFD (α = 0.93), QFD training to supervisors (α = 0.92), and worker-supervisor collaboration in QFD efforts (α = 0.89). (Note: fifteen items were dropped from further analysis due to cross loading.) The seven factors will be used in the path model analysis.

In summary, the model of Figure 1 shows the hypothesised relationship between the seven QFD constructs, self-leadership behavioural-focused strategies and job satisfaction constructs.

4.2 Path modelling

Using the analytical procedure outlined in Politis's (2005b) study, the computation of the parameters λ and θ was performed. These parameters are used in the path model. Table 1 contains the means, standard deviations, reliability estimates, the regression coefficient λ and measurement error θ estimates.

Once these parameters (regression coefficients (λs) which reflect the regression of each composite variable on its latent variable and the measurement error variances (θs) associated with each composite variable) are calculated, we build this information into the path model to examine the relationships among the latent variables.
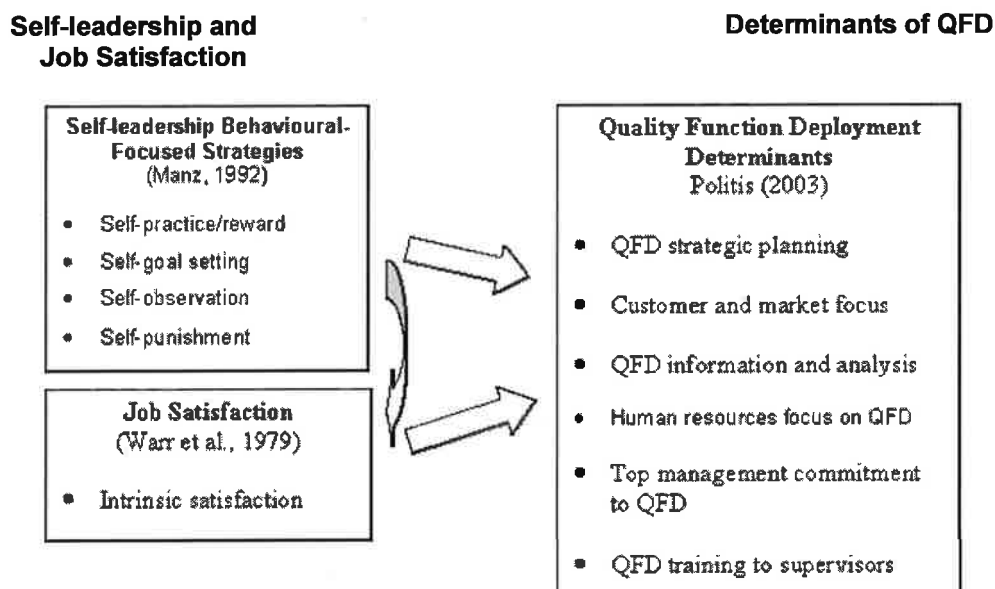
Self-leadership and Job Satisfaction

Determinants of QFD

Figure 1: Summary of variables used in the paper

The path model that was tested contained four self-leadership behavioural-focused dimensions; the variable of job satisfaction; and the seven dimensions of QFD. The analysis revealed that the structural model fits the data well, with $\chi^2/df = 2.09$; GFI = 0.87; AGFI = 0.91; CFI = 0.90; TLI = 0.89; RMR = .054; and RMSEA = 0.088.

Table 1: Descriptive statistics, reliabilities, λ and θ estimates

Variable	Mean	SD (σ)	Reliability Estimate (α)	Loading	Error Variance
Self-leadership Behavioural Focused Strategies				$\lambda = \sigma * \sqrt{\alpha}$	$\theta = \sigma^2 * 1-\alpha$
Self-practice/reward	3.35	0.67	0.80	0.60	0.090
Self-goal setting	3.81	0.62	0.78	0.55	0.085
Self-observation	3.61	0.66	0.72	0.56	0.122
Self-punishment	3.47	0.68	0.70	0.57	0.139
Job Satisfaction					
Intrinsic satisfaction	4.17	1.24	0.85	1.14	0.231
Extrinsic satisfaction	4.90	1.02	0.73	0.87	0.281
QFD Determinants					
QFD strategic planning	4.36	1.19	0.91	1.14	0.127
Customer and market focus	4.64	1.02	0.93	0.98	0.073
QFD information and analysis	4.62	1.05	0.88	0.98	0.132
Human resources focus on QFD	4.43	1.12	0.80	1.00	0.251
Top management commitment to QFD	4.23	1.44	0.93	1.39	0.145
QFD training to supervisors	4.22	1.43	0.92	1.37	0.164
Worker-supervisor collaboration in QFD efforts	4.41	1.09	0.89	1.03	0.131

Note: λ has been rounded to two decimal places.

As the model was becoming unreadable by adding too many variables, it was decided to present the standardised path estimates (γs) in Table 2. It should be noted that only significant regression coefficients are reported.

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Table 2: Standardised path estimates (γs) of self-leadership strategies, job satisfaction and QFD variables

Latent variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Self-leadership behavioural focused strategies													
1. Self-practice/reward	1.00 1												
2. Self-goal setting	.57**	1.00											
3. Self-observation	56***	.65***	1.00										
4. Self-punishment	.65***	.62***	.52***	1.00									
Job satisfaction													
5. Intrinsic job satisfaction	--	--	--	--	1.00								
6. Extrinsic job satisfaction	--	--	--	--	0.61***	1.00							
Quality function deployment variables													
7. QFD Strategic planning	--	--	.78***	--	--	--	1.00						
8. Customer and market focus	--	.58**	.75***	-.48*	--	--	.77***	1.00					
9. QFD information and analysis	.61***	.70***	.61***	-.78***	--	--	.72***	.81***	1.00				
10. Human resources focus on QFD	--	--	.78***	--	--	--	.74***	.75***	.79***	1.00			
11. Top management commitment to QFD	.31**	--	.82***	-.37*	--	--	.78***	.73***	.65*	.69*	1.00		
12. QFD training to supervisors	--	--	.75***	--	--	--	.80***	.73***	.65*	.75*	.85***	1.00	
13. Worker-supervisor collaboration in QFD efforts	--	.17*	.86***	--	0.18*	.15*	.70***	.78***	.80***	.81***	.73*	.76***	1.00

One of the four hypotheses is supported by this data, for the majority of the determinants of QFD. As predicted, the majority of the self-leadership behavioural-focused strategies had a stronger positive effect on the determinants conducive to QFD, hence, supporting Hypothesis 4. Specifically, Self-practice/ rewards is strongly and positively related to the QFD determinants of Information and Analysis ($\gamma = 0.61$, $p < 0.001$), and to Top Management Commitment to QFD ($\gamma = 0.31$, $p < 0.01$). Moreover, Self-goal Setting is strongly and positively related to the QFD determinant of Customer and Market Focus ($\gamma = 0.58$, $p < 0.01$); QFD Information and Analysis ($\gamma = 0.70$, $p < 0.001$); and to Worker-supervisor Collaboration in QFD Efforts ($\gamma = 0.17$, $p < 0.05$). In addition, Self-observation is strongly and positively related to all seven QFD determinants: QFD Strategic Planning ($\gamma = 0.78$, $p < 0.001$); Customer and Market Focus ($\gamma = 0.75$, $p < 0.001$); QFD Information and Analysis ($\gamma = 0.61$, $p < 0.001$); Human Resources Focus on QFD ($\gamma = 0.78$, $p < 0.001$); Top Management

of this study suggest that it would be beneficial for organisations to encourage and empower employees to develop specific behaviours that focus on self-observation, self-goal setting and self-reward/practice, as these behavioural-focused strategies alone explained over 23 per cent of the variance of the QFD determinants. Thus, organisations in the UAE should develop and deliver training programs aimed at equipping employees with self-leadership practices and allowing them to apply self-leadership strategies at work which in turn will enhance QFD methodologies. It should be noted that the results of this study suggest that organisations should discourage employees to develop self-punishment strategies, as these are inclined to inhibit the implementation of QFD programs.

5.1 Limitations and future work

While this research has established a clear relationship between the dimensions underlying the successful implementation of QFD and self-leadership behavioural-focused strategies, some caution must be exercised when interpreting these findings due to a number of limiting factors. First, although a quantitative study is able to establish a relatively clear picture of relationships between phenomena, it is less apt at explaining the reasons behind it. Thus, future qualitative research needs to be considered to explore the underlying variables that enhance and/or inhibit the development of methodologies that are conducive the QFD implementation.

Other limitations include the use of a relatively undeveloped instrument measuring the underlying dimensions conducive to QFD (Note: 15 items were dropped from the measurement model due to cross or poor loading), and the inability to establish causality.

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