SWP 61/89 A COMPARATIVE STUDY OF COGNITIVE STYLES OF MANAGERS

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To be presented at the Annual Conference of the Marketing Education Group,
Glasgow University Business School, July 1989

ABSTRACT

The hypothesis that broadly-defined managerial functions can be subdivided on the basis of their members´ internal and external task orientations, and that the resulting subfunctions are, respectively, predominantly ´adaptive´ or ´innovative´ in terms of Kirton´s adaption-innovation theory, was tested. Data from samples of British (N=115), Australian (N=123) and American (N=131) mid-career managers undertaking MBA programmes who completed the Kirton Adaption-Innovation Inventory (KAI) and provided employment histories displayed the expected patterns of task orientation and cognitive style. Implications for adaption-innovation theory and the management of organizational change are briefly discussed.

INTRODUCTION

Two distinct cognitive styles and consequent approaches to decision-making and problem-solving are posited by adaption-innovation theory (Kirton 1976). Problem-solving by extreme adaptors is constrained by the nature and scope of the problem: adaptors typically prefer to improve current working methods, suggesting solutions that can be accommodated without upsetting existing organizational systems and practices. No such constraints impede the extreme innovator's preferred mode of problem-solving which typically involves a reassessment not only of the immediate problem but also of the frame of reference within which it has arisen. The innovator's solutions are usually more subversive of current operating procedures than the adaptor's, requiring for their implementation reappraisal of established working methods and possibly a fundamental reformulation of organizational goals and purposes.

This dimension of cognitive style is measured by the Kirton Adaption-Innovation Inventory (KAI), a 32-item pencil and paper test on which the repondent indicates the degree of ease or difficulty with which he could maintain specified styles of adaptive and innovative behaviour. Responses on a five-point scale can be computed into a composite score; scores range theoreticaly from the most habitually adaptive at 32 to the most habitually innovative at 160. The observed mean of the British general population is 95.33 (N=532, SD=17.54) and the observed range extends from 46-145; the mean score of British managers is 97 (Kirton 1987). Whilst adaption-innovation is conceptualized as a continuous

variable, for convenience respondents who score (i) below or (ii) at and above the mid-point of the theoretical range (96) are respectively termed adaptors and innovators.

ORGANIZATIONAL BEHAVIOUR OF ADAPTORS AND INNOVATORS

The task orientations of established organizations often demand predominantly adaptive or predominantly innovative cogntive and behavioural styles. As a result, the objectives, climate and culture of an organization come to exert markedly adaptive or innovative demands on members (Kirton 1984; Kirton and McCarthy 1988). Organizations like local authorities and banks which operate in relatively stable and predictable environments tend to be 'mechanistically structured' (Burns and Stalker 1961) and require managerial skills that contribute to continuity and efficiency. Their managers include a disproportionate number of adaptors; those who are not experience greater difficulty in performing the tasks required of them (Foxall 1986a; Gryskiewicz et al. 1986; Hayward and Everett 1983; Holland 1987; Kirton and Pender 1982; Thomson 1980;). By contrast, market-oriented companies operating in frequently changing and uncertain environments are more 'organically structured', requiring managers who can cope with external change, particularly by responding to dynamic demand for new products in the face of strong competition. Their members emerge as preeminently innovative (Foxall 1986b; Gryskiewicz et al. 1986; Keller and Holland 1978; Kirton and McCarthy 1988; Kirton and Pender 1982; Lowe and Taylor 1986; Thomson 1980).

Kirton (1980) suggested that even within an organization, the culture of which required an overall emphasis on one or other mode of decision-making and problem-solving, particular departments would tend to comprise managers whose cognitive styles were either predominantly adaptive or predominantly innovative. In a study of a large business firm, he tested the hypothesis that members of managerial functions whose jobs involved interaction with other departments and external organizations would be more innovative than those whose jobs were entirely or almost entirely contained within a single department. The hypothesis was supported: the KAI mean of members of internally-oriented functions (costing, maintenance, product, support services) was 91.63 (SD=14.47, N=48), whilst that of members of externally-oriented functions (corporate planning, sales, finance, engineering) was 105.18 (SD=14.41, N=23); $t=3.70$, $p<.005$ (one-tailed test).

Kirton's study also revealed that one of these managerial functions, engineering, contained some managers whose work was generally internally-oriented (e.g. maintenance) and others whose work was more multi-paradigmatic and externally-oriented (e.g. research and development). In terms of the KAI means of members of the various managerial functions, engineering in aggregate occupied a position between the internally-oriented cost, production, maintenance and service functions and the externally-oriented functions of sales, planning and finance. The engineers formed a heterogeneous task group. Some, primarily concerned with the maintenance of existing systems, interacted for the most part with their immediate

supervisors or other engineers like themselves. Others, involved in tasks such as planning, negotiating and designing that spread beyond the strict confines of the engineering function, sustained extensive relationships with non-engineers within their own company and with persons in external organizations. Kirton's research indicated that the KAI means of these two subfunctions differed significantly; moreover, the internally-oriented staff were adaptive while those who were externally-oriented were innovative (Kirton 1980; see also Kirton and Pender 1982; Keller 1986).

Kirton (1987) reviews the evidence that adaption-innovation is an entrenched preference resistent to change. The reviewed work, undertaken in a number of organizations and in several countries supports the view that members of broadly-defined managerial groups tend to embrace patterns of decision-making, problem-solving and occupational behaviour which are congruent with the adaptive or innovative cognitive style which characterises the group. Neverthless, observed behaviour does not always conform to the preferred pattern because of situational demands, and the cognitive climate that is appropriate to a specific functional specialism may conflict with the characteristic culture of the organization in which it is located (Kirton and McCarthy 1988). Any consequent accommodation on the part of the individual to environmental demands is viewed wihtin adaption-innovation theory as coping behaviour that can be psychologically expensive. Hence occupational groups cannot usually enforce absolute compliance: some members temporarily conform overtly without changing their underlying contrary preference, though such individuals may

eventually resign (Hayward and Everett 1983), and some refuse to compromise for more than a short time (Lindsay 1985).

In general, however, Kirton's (1980) findings to the effect that occupational groups usually have KAI means that differ according to the predominantly internal or external orientations of their members has been substantiated, indirectly for the most part, but, on occasions, directly (Foxall 1986b). However, Kirton (1980) also drew conclusions from his study of a single organization on the basis of theoretical speculation rather than empirical evidence. For instance, whilst he established that the engineering function could be subdivided as described above, he did no more than assert that the same dichotomization would be characteristic of other managerial functions. The evidence adduced in favour of this speculation in the meantime remains too slight to confirm the original informed extrapolation from limited data. It consists, for example, of reports of students' forecasts of their post-qualifying work orientations (Gul 1986) rather than hard evidence. Kirton (1980) also suggested, in the absence of direct evidence, that the differences he detected would be internationally applicable.

The research reported here critically addresses Kirton's speculation by bringing forward empirical data with respect to the cognitive styles of members of managerial functions and subfunctions. It tests the possibility that broadly-defined managerial functions other than engineering may each be divided into two subfunctions on the basis of the prevailing internal/external task orientation of their

members and that adaptive and innovative cognitive styles are respectively associated with each subfunction. Managerial respondents from a wider range of backgrounds than the single organization used by Kirton were sought (Foxall 1986a); mid-career managers undertaking MBA programmes provided suitably diverse and experienced executives from a wide spectrum of managerial functions and organizational environments. Kirton and Pender (1982) report a tendency for self-selected course participants to be more innovative than individuals who are required by their employers to attend. MBA programmes may thus attract innovators in disproportionate numbers when attendance on such courses is not the norm, e.g. in Britain as opposed to, say, Singapore (Thomson 1980). But within any group whose mean is observed, in accordance with theoretical expectations, to differ significantly from that of the general population, subgroups retain their expected differences in scores from one another (Kirton 1980). Since the purpose of this investigation was to identify precisely such inter-group differences, the MBA programmes presented an acceptable source of managerial respondents. In order to avoid bias resulting from the organizational culture of any one business school the research was conducted with culturally distinctive British, Australian and American samples drawn from a total of six universities.

METHOD

Subjects were 115 mid-career managers on the MBA programme at Cranfield School of Management, in the U.K., 123 similar

managers at three Australian business schools (at Melbourne, Deakin and Monash universities), and 131 similar managers at two Californian business schools (California State University, Fullerton, and Chapman College). Each of the British and Australian respondents completed the KAI and provided a detailed employment history in the form of a resume intended for prospective employees. In addition to biographical details and a list of qualifications, each resume contained a general statement of about 150 words summarising the individual's career, including the nature of tasks accomplished (e.g. 'Ten years as manager of an operating subsidiary in the food industry...General management responsibilities, with special reference to debt and cost reduction...'. 'Representation of the company on the board of other subsidiaries...Reporting directly to managing director...') There followed an employment history containing details of each job held since graduation, and specifying both job titles and the nature of the work actually involved in each. Job descriptions and responsibilities were detailed in about 100 words for each employment. Similar data were elicited for the American sample by means of a specially designed questionnaire which requested comparable information. Analysis of the resumes/questionnaires was undertaken by trained research assistants independently of the investigators. No manager's work is entirely oriented either internally or externally and the allocation of individuals to one or other category required the exercise of considered judgement. In the course of the analysis, therefore, the assistants carefully examined each response, seeking to identify evidence of a

preponderance of intra- or extra-paradigmatic job elements, especially in the most recent employment. As a result, each respondent was allocated to one or other of the subfunctions summarised in Table 1.

(Take in Table 1)

Both internally- and externally-oriented managerial tasks were distinguished within three of the broadly-defined managerial functions, and in all samples, by analysis of the resumes/questionnaires. Thus, those engineers who were concerned with planning and design were distinguished from other engineers, similarly qualified formally, who were principally concerned with the maintenance of existing systems. Similarly, general managers could be subdivided into those who primarily administered internal operating systems and those who contributed to the direction of the whole organization including a large part of its external relationships. Accountants also were found to be primarily concerned with either auditing and presenting internal accounts or the financial planning and appraisal of projects and ventures. It was not possible to subdivide the small subsamples of either operations/production or marketing managers on this basis (indeed, no operations/production managers were identified in the American sample). The resumes/questionnaire responses of members of each of these subsamples reflected predominantly intra-organizational orientations in the case of the operations/production managers, and predominantly extra-organizational orientations on the part of the marketing managers.

RESULTS

As expected, respondents´ mean scores were skewed towards the innovative pole. The mean KAI score of the British sample was 110.29 (SD=14.47), that of the Australian sample was 106.02 (SD=13.82), and that of the American sample was 101.90 (SD=15.59). These differences are small and can probably be accounted for by the differential incidence of managers going on advanced courses in the three countries. KAI means of the broadly-defined functions which were capable of subdivision (i.e. acountants, engineers, and general managers) are shown in Table 2.

(Take in Table 2)

Differences between the mean scores of internally- and externally-oriented subfunctions within these three broadly-defined managerial groups are significant (Tables 3, 4 & 5). The difference between the means of all internally-oriented vs. all externally-oriented managers is also significant. However, comparisons of the broadly-defined managerial functions indicate no important significant differences among the national samples.

(Take in Tables 3, 4 & 5)

DISCUSSION

The results extend Kirton´s analysis in two ways. First,

they indicate that two functions in addition to engineering occupy a ranking, in terms of the mean KAI scores of their members, between the internally-oriented production/operations function and the externally-oriented marketing and sales function. Secondly, they show that three broadly-defined managerial functions can be divided into internally- and externally-oriented subfunctions; moreover, as expected, the means of members of each of the externally-oriented subfunctions tends to be significantly more innovative than that of members of the corresponding internally-oriented subfunction.

The findings confirm that, at least after several years' employment experience, most managers tend to gravitate towards organizational climes most suited to their underlying personalities and preferred style of cognitive functioning (Kirton and McCarthy 1988). This holds both for managers' revealed preference for broadly-defined occupational and professional affiliations and for their preferred mode of cognitive functioning within them. The persisting presence of both adaptive and innovative cognitive styles within the same broadly-defined functions cautions against the attribution of a single stereotyped job descriptions to members of these occupations.

The results are relevant to the management of strategic change which is currently heralded as a key executive challenge of the 1990s. Peters (1988), for instance, argues that managers are faced with constant, disruptive change: hence 'no skill is more important than the corporate capacity to change per se. The company's most urgent task, then, is to learn to welcome - beg for, demand - innovation

from everyone' (p. 275). Others have argued that the emergent managerial task is the proactive creation and implementation of strategies for turbulent change (e.g. Norburn et al. 1988).

But many organizations, perhaps a majority, require only comparatively occasional innovative inputs and rely on sustained continuous adaptive contributions in order to maintain current operating systems. Most managerial work, therefore, involves adapting the status quo, involving, in Kirton's terms, a need to deal with constant intra-paradigmatic change. Adaption-innovation theory, corroborated by the findings discussed above, proposes that not all managers can contribute equally to the pursuit of the relentless discontinuity which is portrayed as normal by some strategic theorists. The cognitive and behavioural styles of many managers indicate contrary preferences. The import of the present study is that strategic prescriptions for corporate change must be sensitive to contrasting styles of information processing, and that the implications of managers' preferred adaptive or innovative modes of working must be acknowledged in the recruitment, induction and operation of managerial task groups at both corporate and functional levels.

Table 1. Task Elements Managerial Subfunctions: Selected Examples

Internally-oriented Subfunctions	Broadly-defined Managerial Functions	Externally-oriented Subfunctions
'Cost'. Internal auditing, preparation of company accounts, budgetary control, accounts computing, implementation of internal accounting controls and records, cost recording.	ACCOUNTING	'Financial'. Corporate finance, financial planning, capital appraisal, investment decisions, financial appraisal, systems review, financial modelling, design of management information systems, supervision of large scale audits.
'Technical'. Maintenance of existing systems, project administration, remedial work, materials management and control, onsite technical supervision, cost control, efficiency and quality control, technical support, plant installation and monitoring.	ENGINEERING	'Managerial'. Project planning and inauguration, negotiation of contracts, liason with clients, project management, resolution of contractual issues, R&D, consultancy, design.
'Administrative'. Administration of one or a few related department(s) involving several tasks: budgeting, trainingl, technical (e.g. office management, branch librarianship), records administration, internal planning and co-ordination.	GENERAL MANAGEMENT	'Directive'. Overarching responsibility for corporate level planning and strategy, determination of strategic scope and direction, corporate missions, overall performance appriasal.

	MARKETING	Marketing planning, strategic market analysis, product development, creation and co-ordination of marketing mix, market research commissioning.
Achievement of production targets, quality control, materials procurement and stock control, maintenance of production systems, budget monitoring, computer control of stock systems, monitoring of production operations.	OPERATIONS/PRODUCTION	

Table 2: KAI Means for Broadly-Defined Managerial Functions.

	BRITISH MANAGERS			AUSTRALIAN MANAGERS			AMERICAN MANAGERS		
Function	N	KAI Mean	SD	N	KAI Mean	SD	N	KAI Mean	SD
Marketing	16	115.81	13.13	6	122.33	10.03	22	99.73	14.18
General Management	29	110.89	11.18	58	105.71	12.82	41	100.76	16.31
Engineering	39	111.05	12.71	36	105.56	14.69	40	104.13	16.89
Accounting/Finance	24	105.66	19.92	16	104.13	13.45	28	102.11	19.28
Operations/Production	7	106.85	20.09	7	103.14	15.49			
TOTAL	115	110.29	14.77	123	106.12	13.82	131	101.90	15.59

Table 3: Comparison of KAI Means for Internally- and Externally-Oriented Subfunctions

BRITISH MANAGERS

Internally-Oriented Subfunctions	N	KAI	SD	Externally-Oriented Subfunctions	N	KAI	SD	t	p<*
Cost Accountants	11	88.54	12.50	Financial Accountants	13	120.15	11.59	6.38	.01
Technical Engineers	5	95.00	17.79	Management Engineers	34	113.41	10.13	2.26	.05
General Management: Administrative	8	103.40	10.97	General Management: Directive	21	113.76	10.09	2.35	.01
Operations/ Production	7	106.85	20.09	Marketing	16	115.81	13.13	1.08	ns
TOTAL	31	97.55	16.21	TOTAL	84	115.00	11.03	5.54	.0005

*difference between means, one-tailed test.

Table 4: Comparison of KAI Means for Internally- and Externally-Oriented Subfunctions

AUSTRALIAN MANAGERS

Internally-Oriented Subfunctions	N	KAI	SD	Externally-Oriented Subfunctions	N	KAI	SD	t	p<*
Cost Accountants	9	96.11	8.74	Financial Accountants	7	114.83	11.41	3.64	.0025
Technical Engineers	16	96.50	11.93	Management Engineers	20	112.80	12.70	3.96	.000
General Management: Administrative	26	98.15	8.80	General Management: Directive	32	111.84	12.37	4.91	.000
Operations/ Production	7	103.14	15.50	Marketing	6	122.33	10.03	2.68	.000
TOTAL	58	97.89	10.58	TOTAL	65	113.39	12.29	5.39	.000

*difference between means, one-tailed test.

Table 5: Comparison of KAI Means for Internally- and Externally-Oriented Subfunctions

AMERICAN MANAGERS

Internally-Oriented Subfunctions	N	KAI	SD	Externally-Oriented Subfunctions	N	KAI	SD	t	p<*
Cost Accountants	22	94.96	14.39	Financial Accountants	6	128.30	9.37	5.04	0.0005
Technical Engineers	21	92.00	13.46	Management Engineers	19	117.53	7.51	6.00	0.0005
General Management: Administrative	27	93.37	13.52	General Management: Directive	14	115.00	11.00	4.86	0.0005
				Marketing	22	99.73	14.18		
TOTAL	70	93.46	13.62	TOTAL	61	111.59	14.64	7.07	0.0005

*difference between means, one-tailed test.

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