Journal of Industrial Psychology, 1999, 25(2), 5–12
Tydskrif vir Bedryfsielkunde, 1999, 25(2), 5–12

COLLECTIVE LEARNING BEHAVIOUR AS A FUNCTION OF AN INDIVIDUAL'S PROPENSITY FOR PARTICIPATIVE MANAGEMENT AND TOLERANCE FOR AMBIGUITY

G. MEYER
C. SCHMIDT
G. ROODT

Department of Human Resource Management

Rand Afrikaans University

ABSTRACT

In this study the relationship between propensity for participative management and tolerance for ambiguity on the one hand, and collective learning behaviours – a particular form of participation – was examined. Three questionnaires measuring these constructs were administered on a sample of 283 employees in a financial services institution. A second order factor analysis yielded two second order factors for propensity for participation, one for tolerance for ambiguity, and three for collective learning behaviours. The three factors for collective learning behaviours served as dependent variables during a multiple regression analysis. Two statistically significant correlations were obtained during a canonical correlation procedure. The findings confirm that there is a statistically significant relationship between propensity for participation and tolerance for ambiguity on the one hand, and collective learning behaviours. The findings and implications are discussed.

OPSOMMING

In hierdie studie is die verband tussen bereidwilligheid tot deelnemende bestuur en verdraagsaamheid teenoor dubbelsinnigheid enersyds, en kollektiewe leergedrag – 'n bepaalde vorm van deelname – andersyds, ondersoek. Drie vraelyste wat hierdie konstrukte meet, is op 'n steekproef van 283 werknemers in 'n finansiële instelling toegepas. 'n Tweede orde faktorontleding het twee faktore ten opsigte van die bereidwilligheid tot deelnemende bestuur, een faktor ten opsigte van verdraagsaamheid teenoor dubbelsinnigheid en drie faktore ten opsigte van kollektiewe leergedrag opgelewer. Laasgenoemde drie faktore het as afhanklike veranderlikes tydens 'n veelvoudige regressie-ontleding gedien. 'n Kanoniese korrelasie het twee statisties beduidende verbande opgelewer. Die bevindinge en implikasies hiervan word bespreek.

The traditional business paradigm which has dominated western society has rested on a number of fundamental ideas and perceptions. These are identified by Capra (1993) as a view of the universe as a mechanical system, life as a competitive struggle for existence, and the belief in unlimited material progress through economic and technological growth. This competitive struggle has resulted in managers in western organisations receiving a lifetime of training in learning to be forceful, articulate 'advocates' and 'problem solvers' where they are offered the opportunity to present and argue their respective points of view. This method of training and ultimately the entire paradigm is continuously coming under criticism. It is postulated by Harman and Hormann (1993) that as a result of being based on this paradigm, the present economic, corporate and social policies are, by and large, inconsistent with long term global development, and are being created without a picture of a viable global future in mind, or an understanding of the global system change required to bring about such a future. As organisations have to compete in this world economy, the problems which are experienced are far more complex and interdependent where no single individual in any organisation will know all the answers. Two related concepts, namely that of participative management and organisational learning are frequently cited as being important prerequisites for dealing with problems of this nature (Aktouf, 1992; Argyris & Schön, 1978). In order to distinguish it from the more encompassing term 'organisational learning' which includes systemic elements (Argyris & Schön, 1996) the term 'collective learning' will be used in this article to refer to learning processes that occur during face-to-face interactions between participants (Schmidt, 1997).

Requests for reprints should be addressed to G Meyer, Department of Human Resource Management, RAU, PO Box 524, Auckland park 2006

The concept of participative management as a means for dealing with complex problems has been the subject of research for many years with its relationships with numerous constructs being extensively documented. In this regard, positive relationships have been found between participative management and other constructs such as satisfaction, self-esteem, loyalty, productivity and manager-subordinate relations (Leana, Ahlbrandt & Murrel, 1992; Mayer & Schoorman, 1992; Nunns & Argirys, 1992; Rafaeli, 1985; Wagner, 1994). In addition, negative relationships have been found with high production costs, inefficiency, and employee incompetence (Frohlich & Krieger, 1990; Latack & Foster, 1985; Mohrman & Ledford, 1985). In recent years, it would appear that the emphasis in research has shifted towards the effectiveness of specific forms of participation on organisational performance (Cotton, Vollrath, Froggatt, Lengnick-Hall & Jennings, 1988; Crandall & Parnell, 1994; Wagner, 1994).

While the benefits of participation have been extensively documented, its implementation does not always appear to be readily accepted. In this regard, Parnell, Bell and Taylor (1992) have identified important individual and organisational variables that may influence an individual's propensity to adopt participative management practices; these being (a) the organisation's culture, (b) whether it is regarded as improving organisational effectiveness, and (c) the individual's perception that it may involve a potential loss of power.

A fundamental premise in the drive towards participative management is that in order for the organisation to function optimally and remain competitive, there is a need for people to think and work together. This working together would however have to represent a goal directed and productive form of interaction, rather than a simple advocating and discussing of ideas and beliefs. This form of discussion (participation) allows for the expression of ideas which in turn

serves as the basis for further discussion which moves towards an end goal. It would appear that even though individuals may have the desire to adopt participative management practices, the quality of interactions is regarded to have a significant effect on the effectiveness of participation. This is described by Swieringa and Wierdsma (1992) as a collective learning process by individuals within an organisation which results in a change and an improvement in that organisation. It is proposed by Hosking and Morley (1991) that interaction, or more specifically conversation, may be regarded as the vehicle through which cognitive images of individuals functioning in a collective context are created and changed. This is demonstrated by mutual reflection and inquiry to surface and test underlying assumptions or patterns of cognition amongst the members of a team (Argyris & Schön, 1978).

Argyris and Schön (1978) identify two broad orientations towards collective learning namely, a defensive orientation which inhibits learning and a productive orientation which facilitates it. The defensive orientation results in negative consequences for learning, in that individuals protect themselves from perceived threat or embarrassment during inquiry into their reasoning processes. The principles of defensive reasoning encourage people to leave their own behaviour unexamined and to avoid any objective test of their premises and conclusions either by withdrawal or by disallowing the asking of questions. This behaviour results in their reasoning being uncorrectable. The productive orientation on the other hand, focuses on making discussable, that which was previously considered undiscussable by means of allowing for reasoning to be questioned and challenged.

Organisations are considered to learn through productive interfaces between organisational members and the environment, as well as between each other. This interaction is of importance in that it appears to not happen naturally as not all members are willing to share all their information. Dixon (1994) introduces a concept of 'meaning structures' which not only relates to information and knowledge, but also to the relationship between various conclusions within individuals' cognitive maps, (that is, the network of individual meaning structures which constitute what an individual knows or understands), the logic by which conclusions are reached, the data which supports them, inferences which have been made from them, and the tacit assumptions behind them. Dixon (1994) also differentiates between three categories of 'meaning structures' in organisations, namely: private, collective, and accessible meaning structures. That part of organisational members cognitive maps which they choose to withhold from other members are described as private meaning structures. Collective meaning structures on the other hand, refers to those which members hold jointly and are agreed upon by virtually all the organisation's members. These may include norms, strategies and form part of the organisation's culture. Of most importance for the purposes of this paper are the accessible meaning structures which members are willing to make available to other members through conversations. It is through these structures that organisations are able to learn (Dixon, 1994).

The importance of dialogue, in the process of collective learning, becomes apparent when viewed in the light of Dixon's (1994) organisational learning cycle, of which these conversational styles form an integral part. The four step organisational learning cycle involves an intentional facilitation of collective learning as opposed to a simple encouragement of members to exchange their accessible meaning structures with each other.

The first step of the cycle is the widespread generation of information which involves collecting external data, an internal development of new ideas, and an analysis of the information. The integration of new/local information into the organisation constitutes the second step which involves disseminating accurate and formatted information into the organisation. The third step is collectively interpreting the information which involves frequent discussions regarding the information. The fourth step in the cycle is having authority to take action on the interpreted meaning. The cycle, by its very nature, then flows back into step one and therefore continues.

Step three focuses on the nature of interaction as a vehicle for collectively interpreting the information. Dixon (1994) emphasises that receiving information and making meaning from it, are two very different processes. When an individual receives new information, it is selectively attended to. The information which is selected, is examined for patterns and compared to the meaning the individual has stored in long term memory. When meaning structures are altered and new relationships between information patterns and the individual's meaning are established, learning may be said to have taken place. In an organisational context, the process is more complex as individuals need to follow the sequence described while interacting with others who are engaged in the same process themselves.

The goal of collective learning is not to reach consensus, but to clarify information collectively to better understand it. By engaging in collective interpretation, according to Dixon (1994), each individual is influenced by the meanings others hold, and in turn, influence the meanings of others. Each individual is provided with the reasoning and data others are using to arrive at their meaning, and thus are able to understand more fully how conclusions are arrived at. Collective interpretation may not develop definite answers, but assists in the understanding of a problem's parameters more clearly (Swieringa & Wierdsma, 1992).

As participative management, of necessity, takes place through the interactions of participants, the quality of such interaction is likely to influence the effectiveness of efforts to participate. For this to occur, there would appear to be a need for organisational members to interact in a way which encourages collective interpretation.

Argyris (1993), Bennett and Brown (1995), Brown (1995), Dixon (1994), and Swieringa and Wierdsma (1992) believe that the answer lies in a productive conversational style which focuses on a mutual generation and understanding of information and reasoning. According to Brown (1995), a process central to developing learning organisations is dialogue, because it requires new ways of thinking about and evaluating communication. Dialogue can be defined as a process which produces a collective examination of ideas, a collective sense of participation, and a collective wisdom. The purpose of dialogue is to build deeper understanding, new perceptions, new models, and new paths to effective action. Although some dialogue is often mistakenly judged within time bounds of interactions, Brown (1995) argues that learning is encouraged by the open-endedness of reflective dialogue.

Bennet and Brown (1995) identify a particular form of collaborative inquiry which supports the discovery of breakthrough insights called strategic dialogue. It is called 'strategic' because it focuses on resolving strategic challenges and dilemmas through a participative problem solving process. Strategic dialogue becomes a forum for exploration of the assumptions underlying an individual's thoughts and actions. The process allows group members to move from the tacit or implicit knowing, to the explicit realm where together, members can see relationships and strategise opportunities which were not evident before. Bennett and Brown (1995) state that a spirit of inquiry is fundamental to ensuring strategic dialogue. Questioning together, allows individuals the opportunity of generating creative solutions and thought. If individuals continue to think as they always have, they will only achieve what they already have, which is not enough to

cope with the competitive and changing environment. Strategic dialogue is therefore useful for learning about complexity where nobody has 'the answer', but the productive inquiry and building on ideas allows for the exploration of possibilities. The objective is finding a coherent interpretation of multiple perspectives (Brown, 1995). Effective dialogue, as described by Dixon (1994), is a combination of providing others with accurate and complete information, challenging errors in others' reasoning or data, voicing the perspective of others, making one's reasoning explicit, regarding assertions (own and others) as hypotheses to be tested, and changing one's position when other's offer convincing data and rationale.

The combination of these activities may be regarded as a unique type of participation which increases the likelihood of learning. Argyris (1994) believes that the more traditional perspectives of participation may paradoxically prevent organisations from obtaining the kind of deep information, insightful behaviour, and productive change they need. With an emphasis on loyalty, co-operation, and respect for authority amongst others, the traditional management perspective may lead to an orientation of not actively attempting to surface the kinds of deep and potentially threatening or embarrassing information which can motivate learning. Out of a sense of caring, members may prefer not to raise issues that are potentially threatening and embarrassing. In their efforts to ensure high levels of morale and correctness, organisational members may prevent issues from being raised which may be crucial for improved performance. Argyris (1994) believes that this 'upbeat' behaviour, consciously or unconsciously, inhibits learning. Brown (1995) describes this as a form of 'face saving' and 'group think' where individuals as members of a group tend to confirm existing assumptions without question in order to avoid conflict.

This type of defensive behaviour is often a function of the individual's social virtues, such as the individual's perception of what behaviours constitute respect, integrity, and so forth (Argyris, 1990). In a group setting, an individual's perceptions of appropriate behaviour (that is, behaviour regarded as socially virtuous/desirable) can influence the extent to which the individual is willing to participate or not. For example, should a situation arise where an individual has identified what he or she may perceive to be an error in team functioning, the individual's concern for coming across as negative prevents him/her from making a contribution which will assist the group to correct itself. The individual in this situation may, for example then, choose to withdraw or withhold information.

According to Dixon (1994), the cyclical nature of learning implies that new discoveries are created by and lead to new questions. These new questions then lead to new discoveries. To attain a productive conversational style which leads to collective learning would require a combination of both stating one's opinions – even though this may involve reconsidering what is regarded as socially appropriate – while allowing for and asking various questions.

McClain Smith (in Senge, Roberts, Ross, Smith & Kleiner, 1994) proposes that facilitating productive reasoning or a generating conversational style between members involves creating a balance between advocacy and inquiry. This balance entails the expression of an individual's thinking and reasoning, and then encouraging others to challenge their point of view. It is believed that if this process is carried out and managed correctly, it will foster learning, creativity and the generation of optimal solutions by participants. A form of participation which fosters learning can therefore be achieved by creating a balance between advocacy and inquiry. The various degrees of advocacy and inquiry is perhaps best depicted by McClain Smith in Senge et al. (1994) in which four types of conversational styles are identified based on different levels of advocacy and inquiry.

The four quadrants represent behavioural styles which are based on the levels of advocacy and inquiry, can be classified as collective learning styles, with the amount of both individual and group learning increasing from the first quadrant through to maximum learning in quadrant four. This assumption is based on Argyris' (1993) theory, where a simple 'telling' approach, in which the status quo and governing variables are not challenged, results in less effective learning than a 'generating' style, where statements are made and then challenged and discussed, which results in the generation of new ideas and ultimately increases learning.

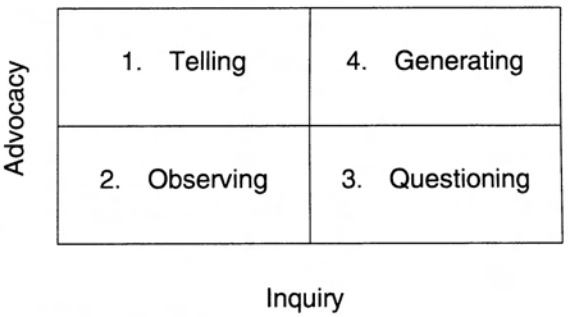

Figure 1: Advocacy/Inquiry Matrix
(Adapted by Senge et al *1994)*

McClain Smith's model, in Senge et al. (1994), implies a certain degree of participation, or more specifically, that these styles can be related to an individual's willingness to interact or propensity to adopt participative management practices. In this regard, it is postulated that individuals adopting a predominantly 'telling', 'observing' or 'asking' style will be less prone to adopt participative management techniques; while individuals adopting a 'generating' style will attempt to obtain a balance between advocacy and inquiry in decision making and will be more prone to adopt participative management techniques and practices. On the basis of the above, it is proposed that an individual's propensity to adopt participative management practices will serve to predict the type of collective learning behaviour the individual is likely to produce.

Allowing for a balance between advocacy and inquiry requires individuals to be able to cope with many different perspectives on issues as well as various individual and organisational complexities and differences. These complexities and differences can result in a lack of structure which some individuals may find difficult to cope with. It would therefore appear that creating a balance between advocacy and inquiry might require individuals to tolerate and/or cope with unstructured and possibly ambiguous situations.

Following research conducted regarding the relationship between authoritarianism and tolerance for ambiguity (Adorno, Frenkel-Brunswik, Levinson & Sanford, 1964; Heaven, 1980; Hogan, 1975; Orpen, 1972; Stone, Lederer & Christie, 1993) in which negative correlations were found between a high tolerance for ambiguity and authoritarianism, it is proposed that an individual's tolerance for ambiguity will also serve to predict the type of collective learning behaviour an individual is likely to produce. It is believed that the 'generating' style allows for vulnerability on the part of the communicator which is a result of a lack of structure, and individuals who are unable to tolerate this lack of structure would therefore not use this collective learning style. In other words, it is proposed that individuals who are less tolerant of ambiguity would prefer to adopt 'telling', 'observing' or 'asking' styles, while individuals

more tolerant of ambiguity would utilise the 'generating' style. Tolerance for ambiguity would then be a predictor of collective learning behaviour.

Given that an individual's propensity for participative management as well as tolerance for ambiguity may conceptually be related to a specific form of participative behaviour that results in collective learning; the purpose of this study is to investigate the nature of the relationship between propensity for participative management and tolerance for ambiguity on the one hand, and collective learning behaviours on the other.

Hypothesis

Collective learning behaviour (dependent variable) can be predicted by two independent variables, namely propensity for participative management and tolerance for ambiguity.

METHOD

Sample

The research was conducted in a major South African financial services organisation. A convenience sample of 283 staff of diverse ages, education, level in the organisational hierarchy and cultural background were included.

Of the total respondents, 35,3% were male and 64,7% female. The level of education of the sample was as follows: 2,1% had an honours degree, 5,7% had a degree, 19,8% were in possession of a diploma or certificate, 55,1% had matric or equivalent, 17% had less than a matric, and 0,4% did not respond. With regard to the representation of different language groups in the sample: English represented 52,7%, Afrikaans 32,2%, Xhosa 1,8%, Zulu 4,6%, Northern and Southern Sotho together 3,6%, Tsonga 0,7%, Pedi 0,4%, Tswana 2,8%, and Other 1,4%. The average age of respondents was 31,9 years with the youngest respondent being 18 and the oldest being 56 years of age. The average working experience was 11,7 years with the shortest working experience being 1 year and the longest being 41 years. Respondents were divided in terms of positional status in the organisational hierarchy as follows: 38,7% were clerical, 44,1% supervisory, and 17,2% managerial.

Measuring Instruments

An instrument developed by Schmidt (1997) which measures an individual's preference for one of four types of behavioural styles, based on Argyris' (1993) theory of organisational learning, was used to measure collective learning behaviours. The instrument provides a measure of four interactional styles relevant to learning collectively, these being harmonising, withdrawing/observing, advocating and generating. These factors can be related to the McClain Smith Advocacy/Inquiry matrix discussed earlier.

Schmidt's (1997) orientations towards collective learning behaviour instrument originally comprised 79 items which was reduced to 64 through item analysis. The items are responded to on a 7 point intensity scale of which only the poles are labelled. The instrument was originally tested on a sample of 317 individuals, male and female, who had educational levels ranging from standard ten to post graduate qualifications. The sample also comprised individuals whose first language could have been one of 12 different languages. The reliability coefficients (Cronbach Alpha) of the various factors were as follows: scale 1 'generating' (0,879), scale 2 'harmonising' (0,809), scale 3 'telling' (0,761), and scale 4 'observing' (0,772). An additional 35 items were added to the instrument in an attempt to more fully encompass McClain Smith's model while ensuring that the factor representing 'harmonising' behaviour, not included in the theory, be maintained.

The Propensity for Participative Management (PPM) Scale developed by Parnell, Bell and Taylor (1992) was used to measure each respondent's propensity to adopt participative management techniques. The theory underlying this instrument is that an individual's propensity for participative management is influenced by the following three constructs: organisational effectiveness, power, and organisational culture. The PPM instrument comprised a self report questionnaire based on the above mentioned constructs. In the development of the instrument, 33 items were originally used which was reduced to 12 after factor analysis, with a Cronbach Alpha coefficient of 0,84. The PPM scale was however refined, with 29 items being added in an attempt to better reflect the theory (Visser, Roodt & Schepers, 1997).

Norton's (1975) instrument for measuring tolerance for ambiguity called the MAT – 50 was selected as the third measuring instrument. The MAT-50 comprises 61 questions regarding tolerance for ambiguity in eight categories including a philosophy, interpersonal communication, public image, job related, problem solving, social, habit, and art forms. The development of this measure started with MacDonald's (1970) 20 item test which was revised 7 times before the final format was obtained. Internal reliability (Kuder-Richardson 20) for the seventh version of the MAT-50 was 0,88 while the test-retest reliability after a 10 to 12 week period was 0,86. The MAT-50 questionnaire was not refined for the purposes of this study and was responded to on a 7 point intensity scale for which only the poles were labelled.

Procedure

The questionnaires were completed by respondents under supervision in a training environment. The 'supervisor' read the instructions of each questionnaire before respondents were asked to complete them. The 'supervisor' was also on hand to answer any questions which may have arisen regarding the understanding of any items. No time limits were enforced although respondents could not begin the second and third questionnaires until the preceding one had been completed.

RESULTS

Factor Analysis

A factor analysis using the BMDP programme according to the procedure developed by Schepers (1992) was carried out. Each of the measures was subjected to a first order factor analysis which resulted in 31 factors being extracted from the collective learning behaviour measure, 12 from propensity for participative management, and 21 from the tolerance for ambiguity measure. Subscores were determined for each of the factors, which were then intercorrelated and subjected to a second order factor analysis. The obtained factor matrix for each measure was rotated to a simple structure using the direct oblimin rotation and then sorted. This yielded three second order factors for collective learning behaviours, two second order factors for propensity for participative management, and one second order factor for tolerance for ambiguity. The intercorrelation matrix of the rotated factors is produced in Table 1.

For each of the factors, a Cronbach Alpha reliability coefficient was computed, as well as the reliability indices for each item. The respective reliability coefficients for each factor together with the number of items in each factor is presented in Table 2.

From an inspection of the item statistics, the various factors can be defined in terms of Argyris' (1990) and McClain Smith's (in Senge et al., 1994) theories. Although they do not fit exactly in terms of, for example, McClain Smith's Advocacy/Inquiry

Matrix, logical deductions can be made. The first factor for collective learning behaviours has elements of McClain Smiths 'telling style', Argyris' (1990) model 1 social virtues, and Schmidt's (1997) defensive/protective learning orientations. It would appear that the emphasis in this factor is on adopting participative behaviour, but not of a kind that probes deeper levels of understanding and sense making processes of individuals, which would lead to deeper levels of learning. High scores on this factor would not necessarily imply an absence of collective learning, but rather that the learning that does take place is in service of maintaining the status quo. For this reason, this factor may tentatively be referred to as 'Protective Reasoning'. The second collective learning behaviour factor appears to relate to behaviour aimed at predominantly ensuring harmony and protection against embarrassment and threat from members in a group. This factor was also found in Schmidt's (1997) research although not appearing in the Advocacy/Inquiry Matrix of McClain Smith. High scores on this factor would indicate a style of participation primarily aimed at maintaining harmony in the team, although this may not be in the interest of learning, especially when the raising of contentious issues is crucial for learning to take place. This factor will therefore be referred to as 'harmonising' behaviour. The third factor of collective learning behaviours relates to conversational behaviour aimed at an examination of issues confronting the group, involving explanations of how conclusions are arrived at, while there is clear evidence of extending invitations for probing the views and opinions stated. This combination of advocacy and inquiry related behaviour corresponds with McClain Smith's 'generating' style and Argyris' productive-reflective conversational strategies. It is therefore proposed that this factor be referred to as 'public reflection'.

TABLE 1
INTERCORRELATION FACTOR MATRIX

FACTORS	FACTOR P1	FACTOR P2	FACTOR T1	FACTOR C1	FACTOR C2
FACTOR P1					
FACTOR P2	−.045				
FACTOR T1	.217**	.302**			
FACTOR C1	.422**	.034	.316**		
FACTOR C2	.067	.368**	.390**	.155	
FACTOR C3	.244**	.103	.237**	.472**	.167**

***Correlation is significant at the 0,01 level (2-tailed).*

TABLE 2
RELIABILITY COEFFICIENTS FOR EACH SECOND ORDER FACTOR

FACTOR	RELIABILITY COEFFICIENT (Cronbach Alpha)	NUMBER OF ITEMS
Collective Learning		
Coll 1 – Protective Reasoning	0.906	38
Coll 2 – Harmonising	0.810	22
Coll 3 – Public Reflection	0.806	20
Propensity for Participation		
Part 1 – Culture	0.862	23
Part 2 – Power	0.738	12
Tolerance for Ambiguity		
Toll 1 – Tolerance for Ambiguity	871	49

The 2 factors in the propensity for participative management scale related closely to the theory of Parnell *et al.* (1992). After an inspection of the item statistics it can be concluded that factor 1 relates to 'culture', that is, whether or not the prevailing culture in an organisation influences an individual's propensity to adopt participative management techniques. Factor 2, on the other hand, relates to 'power', in that if an individual believes that participative management techniques will result in a loss of power, they will be less likely to solicit its implementation.

Finally, the single factor in the tolerance for ambiguity scale will simply be referred to as 'tolerance for ambiguity'.

Regression Analysis

A multiple regression analysis was conducted using the three factors of the independent variables, namely culture, power, and tolerance for ambiguity as predictors of each factor in the dependent variable, being collective learning behaviours. The results of the multiple regression analysis are given in Tables 3, 4 and 5 respectively.

From a close scrutiny of Table 3, it is clear that a multiple correlation of 0,481 was obtained using culture, power and tolerance for ambiguity as predictors, and protective reasoning as criterion. It can also be seen that 23,10% of the variance of protective reasoning was accounted for by the three predictors. Furthermore, it is apparent from the regression coefficients of culture, power and tolerance for ambiguity that only culture and tolerance for ambiguity are statistically significant.

From a close inspection of Table 4, it can be seen that a multiple correlation of 0,471 was obtained using culture, power and tolerance for ambiguity as predictors, and harmonising behaviour as criterion. It can also be seen that 22,10% of the variance of harmonising behaviour was accounted for by the three predictors. Furthermore, it is apparent from the regression coefficients of culture, power and tolerance for ambiguity that only power and tolerance for ambiguity are statistically significant.

From a close inspection of Table 5, it can be seen that a multiple correlation of 0,313 was obtained using culture, power and tolerance for ambiguity as predictors, and public reflection as criterion. It can be seen that 9,80% of the variance of public reflection was accounted for by the three predictors. Furthermore, it is apparent from the regression coefficients of culture, power and tolerance for ambiguity that only culture and tolerance for ambiguity are statistically significant.

Canonical Correlations

In order to determine the number of statistically significant canonical correlations, Bartlett's chi-square test was performed. The results of this test are given in Table 6.

From an inspection of Table 6, it appears that at least the first two eigenvalues are significant and the researcher is thus entitled to interpret the first two sets of canonical correlations given in Table 7.

The correlations of the original measures with the first canonical variate pair are given in the second column of Table 7. From an inspection of this column, it appears that culture (0,608), power (0,481), and tolerance for ambiguity (0,854) are all positively correlated with the first canonical variate (X-variate), whilst protective reasoning (0,757), harmonising (0,722), and public reflection (0,547) are all positively correlated with the Y-variate. The first canonical correlation of the X-variate with the Y-variate is 0,555. Thus 30,81% (Table 6) of the variance of the Y-variate is accounted for by the X-variate.

TABLE 3
MULTIPLE REGRESSION: DEPENDENT VARIABLE COLL 1 (PROTECTIVE REASONING)

ANALYSIS OF VARIANCE

	SOURCE OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE
Multiple R: 0,481				
R Squared: 0,231	Regression	3	55471,005	18490,335
Adjusted R Squared: 0,223	Residual	279	184547,059	661,459
	F = 27,954			
Std error: 25,72	P < 0,01			

VARIABLES IN THE EQUATION

INDEPENDENT VARIABLES	B	SEB	BETA	t-VALUE	p
Part 1 (Culture)	0,515	0,076	0,368	6,795	0,00
Part 2 (Power)	–0,061	0,145	–0,023	–0,421	0,674
Toll 1 Tolerance)	0,201	0,047	0,243	4,278	0,00
Constant = 113,784					

TABLE 4
MULTIPLE REGRESSION: DEPENDENT VARIABLE COLL 2 (HARMONISING)

ANALYSIS OF VARIANCE

	SOURCE OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE
Multiple R: 0,471				
R Squared: 0,221	Regression	3	23102,221	7700,740
Adjusted R Squared: 0,213	Residual	279	81201,955	291,046
	F = 26,459			
Std error: 17,06	P < 0,01			

VARIABLES IN THE EQUATION

INDEPENDENT VARIABLES	B	SEB	BETA	t-VALUE	p
Part 1 (Culture)	0,012	0,050	0,013	0,244	0,808
Part 2 (Power)	0,476	0,096	0,277	4,962	0,00
Toll 1 Tolerance)	0,166	0,031	0,304	5,319	0,00
Constant = 38,413					

TABLE 5
MULTIPLE REGRESSION: DEPENDENT VARIABLE COLL 2 (PUBLIC REFLECTION)

ANALYSIS OF VARIANCE

	SOURCE OF VARIANCE	DF	SUM OF SQUARES	MEAN SQUARE
Multiple R: 0,313				
R Squared: 0,098	Regression	3	7419,678	2473,226
Adjusted R Squared: 0,088	Residual	279	68206,979	244,469
	F = 10,117			
Std error: 15,64	P < 0,01			

VARIABLES IN THE EQUATION

INDEPENDENT VARIABLES	B	SEB	BETA	t-VALUE	p
Part 1 (Culture)	0,164	0,046	0,209	3,565	0,00
Part 2 (Power)	0,088	0,088	0,060	0,998	0,319
Toll 1 Tolerance)	0,080	0,029	0,173	2,814	0,005
Constant = 52,561					

TABLE 6
STATISTICAL SIGNIFICANCE OF CANONICAL CORRELATIONS – BARTLETT'S TEST FOR REMAINING EIGENVALUES

EIGENVALUE	CANONICAL CORRELATION	NO. OF EIGENVALUES	BARTLETT'S TEST OF SIGNIFICANCE FOR REMAINING EIGENVALUES (Chi-square)	DF	p
			141,62	9	< 0,01
0,30806	0,55503	1	39,06	4	< 0,01
0,13038	0,36109	2	0,15	1	0,6983

TABLE 7
CANONICAL CORRELATIONS OF INDEPENDENT VARIABLES WITH DEPENDENT VARIABLES

CORRELATIONS OF ORIGINAL MEASURES WITH CANONICAL VARIABLES

	FIRST	SECOND
Independent Variables		
Part 1 (Culture)	0,608	–0,714
Part 2 (Power)	0,481	0,717
Toll 1 (Tolerance for Ambiguity)	0,854	0,190
Percentage variance explained of x	44,38%	35,33%
Redundancy index	13,67%	4,61%
Dependent Variables		
Coll 1 (Protective reasoning)	0,757	–0,647
Coll 2 (Harmonising)	0,722	0,683
Coll 3 (Public reflection)	0,547	–0,204
Percentage variance explained of y	46,48%	30,88%
Redundancy index	14,32%	4,03%

CORRELATIONS OF SET OF IV'S WITH DV'S

	FIRST	SECOND
Canonical Correlations	0,555	0,361

It can also be seen from Table 7 that the X-variate accounts for 44,38% of the variance of the original independent variables and the Y-variate accounts for 46,48% of the variance of the original dependent variables. As far as the redundancy is concerned, it appears that the X-variate accounts for 13,67% of the dependent variables and the Y-variate accounts for 14,32% of the variance of the independent variables.

The second canonical variate is concerned with culture (-0,714) which is negatively correlated with the X-variate, power (0,717) which is positively correlated with the X-variate, and protective reasoning (-0,647), negatively correlated with the Y-variate, and harmonising (0,683) which is positively correlated with the Y-variate. It appears that the X-variate accounts for 35,33% of the variance of the independent variables and the Y-variate accounts for 30,88% of the variance of the dependent variables. The redundancy index of the X-variate accounts for 4,61% of the variance of the dependent variables and the redundancy index of the Y-variate accounts for 4,03% of the variance of the independent variables. The second canonical correlation of the X-variate with the Y-variate is 0,361. Therefore, 13,04% (Table 6) of the variance of the Y-variate is accounted for by the X-variate.

DISCUSSION

The primary objective of the study was to examine the relationship between propensity for participative management and tolerance for ambiguity on the one hand, and collective learning behaviours on the other. Both the regression analyses and the canonical correlations have revealed that there are significant relationships between the variables.

From the multiple regression analyses, it was found that culture and tolerance for ambiguity are predictors of protective reasoning behaviour; power and tolerance for ambiguity are predictors of harmonising behaviour, while culture and tolerance for ambiguity are predictors of public reflection behaviours. Tolerance for ambiguity is included as predictor of all three criterion variables, and power for only one criterion variable.

According to Parnell et al. (1992), culture refers to the extent to which an organisation's culture determines an individual's willingness to employ participative management practices. It can therefore be concluded that although the culture of an organisation may prescribe participative management practices, it is possible for individuals within the organisation to adopt protective reasoning behaviours characterised by asserting opinions and explaining them, but not inviting others to question these views in an attempt to maintain the status quo. This type of behaviour may be attributed to a sense of loyalty, co-operation and respect for authority where no active attempt is made to surface the type of deep and potentially threatening or embarrassing information which can motivate learning (Argyris, 1994).

According to Parnell et al. (1992), power refers to the extent to which individuals feel that participative management practices will result in a loss of power. The results in Table 3 suggest that individuals who believe that participative management practices will result in a loss of power, may adopt harmonising behaviours such as giving approval and praise, reducing feelings of hurt and embarrassment, displaying a caring attitude in an attempt to keep up employee morale, and in so doing, reduce the risk of losing power.

Public reflection as described earlier entails a balance between advocacy and inquiry which aims to examine issues confronting a group through skilful discussion, coupled with public reasoning, questioning and reflection. The results in Table 4 would suggest that due to the potentially threatening or embarrassing nature of these interactions, they will only be undertaken in a facilitative environment. It is for this reason that the participative culture within the organisation may serve to facilitate and therefore predict public reflection behaviours.

The finding that tolerance for ambiguity is a predictor of all three collective learning behaviours may be explained on the basis that there is a certain level of participation involved in each of the behavioural styles. This finding is congruent with the findings of Heaven (1980) in which positive relations were found between tolerance for ambiguity and participative management practices.

In the first canonical correlation, the X-variate is best described by culture, power and tolerance for ambiguity. Similarly, the Y-variate is best described by protective reasoning, harmonising and public reflection. The correlation of the two sets is 0,555 which supports the primary objective of the study. The high weighting of tolerance for ambiguity can be interpreted in terms of Heaven's (1980) research in that all three collective learning behaviours imply a certain level of participation.

In the second canonical correlation, the X-variate is best described by culture and power. Unlike in the first variate, culture and power do not support each other. It is therefore proposed that the X-variate is power driven, that is, the higher the score on culture the lower the score on power. The Y-variate is best described by protective reasoning and harmonising, and it can be seen that the higher the score on protective reasoning, the lower the score on harmonising. The correlations between the two sets are significant which lends support to the overall objective of the study, namely that there is a relationship between propensity for participative management and tolerance for ambiguity on the one hand, and collective learning behaviours on the other. It is interesting to note that when culture and power are both positive, both protective reasoning and public reflection are both positive and significant. In the power driven variate, on the other hand, where culture (negative) and power (positive) are negatively related, protective reasoning remains positively related to culture while public reflection is not significant. It could therefore be proposed that both a participative culture as well as individuals who do not feel that participation will result in a loss of power are prerequisites for individuals to effectively employ public reflective behaviours aimed at collective learning. It is also proposed that both a facilitative environment and a willingness on the part of the individual are prerequisites for public reflective behaviours, although the results of this study would suggest that additional variables, not covered in this study, are likely to influence the ability of individuals to adopt such behaviours.

A number of possible limitations with this study have been identified. The limitations are primarily related to the measurement of collective learning behaviours, where the use of a self report questionnaire may not be the most effective method of measurement. The self report questionnaire lends itself to socially desirable responses. This may be the reason for there being no factors representing unilateral advocacy nor inquiry as is highlighted in the theory. This limitation is exacerbated by the potential for a self report questionnaire only measuring an individual's espoused behaviours as opposed to behaviours in action Argyris (1993). The identification of criterion information for validation purposes may therefore be a possibility for future research.

A further limitation of the study is the use of a convenience sample. This sample is, however, considered to be adequate as the study explores the relationship between the variables and no attempt is made to generalise the findings to a particular population.

A replication of the study using managers/supervisors with teams (staff reporting to them) of different sizes may also highlight the different collective learning behaviours. The size of the team may be a further predictor of collective learning behaviour.

Finally, the concept of propensity for participative management needs to be researched further in order to develop a more comprehensive scale to describe why an individual is, or is not, willing to adopt participative management practices. This would allow for the identification of further organisational and personal variables relating to propensity for participative management.

REFERENCES

Adorno, T.W., Frenkel-Brunswik, E., Levinson, D.J. & Sanford, R.N. (1964). *The authoritarian personality.* New York : John Wiley & Sons Inc.

Aktouf, O. (1992). *Management and theories of organisations in the 1990's: Toward a critical radical humanism?* Academy of Management, 17(3), 407–431.

Argyris, C. (1990). *Overcoming organisational defences.* Boston: Allyn & Bacon.

Argyris, C. (1993). *Knowledge for action.* San Francisco: Jossey – Bass.

Argyris, C. (1994). Good communication that blocks learning. *Harvard Business Review,* 72(4), 77–85.

Argyris, C. & Schön, D.A. (1978). *Organisational learning: A theory of action perspective.* Reading: Addison – Wesley.

Argyris, C. & Schön, D.A. (1996). *Organisational learning II: Theory, method, and practice.* Reading: Addison – Wesley.

Bennett, S. & Brown, J. (1995). Mindshift: Strategic dialogue for breakthrough thinking. In Chawla, S. & Renesch, J., *Learning organisations: Developing cultures for tomorrow's workplace* (Eds.). Portland Productivity Press.

Brown, J. (1995). Dialogue : capacities and stories. In Chawla, S. & Renesch, J., *Learning organisations: Developing cultures for tomorrow's workplace* (Eds.). Portland Productivity Press.

Capra, F. (1993). *The turning point.* London: Flamingo.

Cotton, J.L., Vollrath, D.A., Froggatt, K.L., Lengnick-Hall, M.L. & Jennings, K.R. (1988). Employee participation: Diverse forms and different outcomes. *Academy of Management Review,* 13(1), 8–22.

Crandall, W.R. & Parnell, J.A. (1994). The relationship between propensity for participative management and intentions to leave: re-opening the case for participation. *Mid-Atlantic Journal of Business,* 30(2), 197–209.

Dixon, N.M. (1994). *The organisational learning cycle.* London: McGraw-Hill

Frohlich, D. & Krieger, H. (1990). Technological change and worker participation in Europe. *New Technology, Work and Employment,* 5(2), 94–106.

Harman, H. & Hormann, J. (1993). The breakdown of the old paradigm. In Ray, M. & Rinzler, A. (Eds). *The new paradigm in business.* New York: Tarcher/Perigee.

Heaven, P.C.L. (1980). *Authoritarianism: South African studies.* Bloemfontein: P.J. de Villiers.

Hogan, H.W. (1975). Validity of a symbolic measure of Authoritarianism. *Psychology Report,* 37, 536–543.

Hosking, D. & Morley, I.E. (1991). *A social psychology of organising.* London: Harvester-Weatsheaf.

Latack, J.C. & Foster, L.W. (1985). Implementation of compressed work schedules: participation and job redesign as critical factors for employee acceptance. *Personnel Psychology,* 38(1), 75– 1.

Leana, C.R., Ahlbrandt, R.S. & Murrel, A.J. (1992). The effects of employee involvement programs on unionised workers' attitudes, perceptions, and preferences in decision making. *Academy of Management Journal,* 35(4), 861– 73.

MacDonald, A.P. (1970). Revised scale for ambiguity tolerance: reliability and validity. *Psychological Reports,* 26, 791– 98.

Mayer, R.C. & Schoorman, F.D. (1992). Predicting participation and production outcomes through a two dimensional model of organisational commitment. *Academy of Management Journal,* 35(3), 671–683.

Mohrman, S.A. & Ledford, G.E. (1985). The design and use of effective employee participation groups: Implications for human resources management. *Human Resources Management,* 24(4), 413–428.

Norton, R.W. (1975). Measurement of ambiguity. *Journal of Personality Assessment,* 39(6), 607–619.

Nunns, C.G. & Argirys, L. (1992). Exploring manager-subordinate dyads: The moderating effect of supervisory support on the relationship between work locus of control and job involvement. S.A. *Journal of Business Management,* 23(2), 40–45.

Orpen, C. (1972). A cross-cultural investigation of the relationship between conservatism and personality. *Journal of Social Psychology,* 81, 297–300.

Parnell, J.A., Bell, E.D. & Taylor, R. (1992). The propensity for participative management: A conceptual and empirical analysis. *Mid-Atlantic Journal of Business,* 28(1), 31– 2.

Rafaeli, A. (1985). Quality circles and employee attitudes. *Personnel Psychology,* 38(3), 603–615.

Schepers, J.M. (1992). Toetskonstruksie: Teorie en praktyk. Johannesburg: Rand Afrikaans University.

Schmidt, C. (1997). Argyris and associates' orientations towards learning collectively: Can it be measured through self reports? *Journal of Industrial Psychology,* 23(2), 46–55.

Senge, P.M., Roberts, C., Ross, R.B., Smith, B.J. & Kleiner, A. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organisation.* London: Nicholas Brealey.

Stone, W.F., Lederer, G. & Christie, R. (1993). *Strength and weakness: The authoritarian personality.* New York: Springer – Verlag.

Swieringa, J. & Wierdsma, A. (1992). *Becoming a learning organisation: Beyond the learning curve.* Massachusetts: Addison – Wesley.

Visser, W.P., Roodt, G. & Schepers, J.M. (1997). Deelnemende bestuur as 'n funksie van bestuurders se selfkonsep en mensbeskouing. *Tydskrif vir Bedryfsielkunde,* 23(1), 42–49.

Wagner, J.A. (1994). Participation effects on performance and satisfaction: A reconsideration of research evidence. *Academy of Management Review,* 19(2), 312–330.