ROLE BALANCE AND TEAM DEVELOPMENT: A STUDY OF TEAM ROLE CHARACTERISTICS UNDERLYING HIGH AND LOW PERFORMING TEAMS

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ABSTRACT

It has been suggested that certain roles played by team members determine team performance. In this study an analysis of the performance of 342 individuals organised into 33 teams indicates that team roles characterised by creativity, co-ordination and co-operation are positively correlated with team performance. Members of developed teams exhibit certain performance enhancing characteristics and behaviours. Amongst the more developed teams there is a positive relationship between Specialist role characteristics and team performance. While the characteristics associated with the Co-ordinator role are also positively correlated with performance, these can impede the performance of less developed teams.

INTRODUCTION

Teams combine the efforts of individual contributors and provide synergistic outcomes. This unique process, although not fully understood (Kozlowski and Klein, [19]), has led organisations to rely increasingly on teams as prime movers for innovation and change. Fleming and Koppleman [13], cite large organisations in the USA such as Boeing, Chrysler, Corning, DuPont, Eastman Kodak, General Motors, Hewlett-Packard and Xerox as examples where teamwork is fully supported and encouraged. The example of these industrial leaders provides impetus for other organisations to follow and results in high performing work teams being of ongoing interest (West & Markiewicz, [36]). This study explores the relationship between the individual roles and team performance. In doing this, it aims to contribute to the understanding of how teams perform in a dynamic environment where they go through different stages of development.

TEAM ROLES AND TEAM PERFORMANCE

Early studies on group dynamics centred on the individual's roles within the group and the behaviours associated with the performance of such roles. For example Benne and Sheats [6] distinguished task from maintenance roles and Bales [2] categorised the behaviours arising from these roles into task-oriented and socio-emotional behaviours.

Interest in teams gained momentum in the 1980s with the publication of Belbin's [4] work on successful teams. The research into teams and teamwork followed two lines of inquiry. Writers such as Belbin [4] [5], Woodcock [38], Margerison and McCann [24], Davis et al. [8], Parker [26] and Spencer and Pruss [32] focused on team roles and how these affected team performance. Lindgren [22] believed that, in a social psychological sense, 'roles' were behaviours one exhibited within the constraints assigned by the outside world to one's position e.g. leader, manager, supervisor, worker etc. Personality traits, on the other hand, were internally driven and relatively stable over time and across situations. These traits affected behavioural patterns in predictable ways (Pervin, [28]) and, in varying degrees, became part of 'role' definition as well.

The other line of inquiry focused on measuring the 'effectiveness' of teams. Writers such as Deihl and Stroebe [9], Gersik [14], Evenden and Anderson [11], Cohen and Ledford [7] and Katzenbach [18] were concerned with high performing teams and the objective measurement of their effectiveness. McFadzean [25] believed that variables such as personality, group size, work norms, status relationships, group structure etc. impacted on team 'effectiveness' and its measurement.

Belbin's Team Roles

Belbin's [4] seminal work identified eight team roles, which were redefined and increased to nine roles in Belbin [5], that occurred 'naturally' and had to be spread or 'balanced' amongst team members for the team to be high performing. He defined team performance in his early research in terms of the achieved outcomes in a management simulation. Belbin believed that a management team of six persons was ideal for working on complex problems. This meant that team members would have to take on more than one of the nine role characteristics listed in Table 1.

TABLE 1: BELBIN'S ROLE CHARACTERISTICS

Plant (PL)	Creative, imaginative, unorthodox. Solves difficult problems
Resource Investigator (RI)	Extrovert, enthusiastic, communicative. Explores opportunities. Develops contacts.
Co-ordinator (CO)	Mature, confident, a good chairperson. Clarifies goals, promotes decision-making, delegates well.
Shaper (SH)	Chellenging, dynamic, thrives on pressure. The drive and courage to overcome obstacles.
Monitor Evaluator (ME)	Sober, strategic and discerning. Sees all options. Judges accurately.
Team Worker (TW)	Co-operative, mild, perceptive and diplomatic. Listens, builds, averts friction.
Implementer (IMP)	Disciplined, reliable, conservative and efficient. Turns ideas into practical actions.
Completer-Finisher (CF)	Painstaking, conscientious, anxious. Searches out errors and omissions. Delivers on time.
Specialist (SP)	Single-minded, self-starting, dedicated. Provides knowledge and skills in rare supply.

Source: Belbin Associates [3]

Belbin's Self Perception Inventory (SPI) used in his research consisted of seven sections. Each section had a heading and ten statements. Respondents had ten points for each section to distribute amongst the statements. They were required to allocate more points for statements they felt more accurately reflected their character and less points or zero to those that were less reflective of their character or totally irrelevant. Researchers have made comparisons of other established theoretical models with Belbin's original SPI and the Belbin Team Role Self-Perception Inventory (BTRSPI) developed in 1993. These comparisons with 16PF and OPQ (Dulewicz, [10]), the Big 5 (Lindgren, [22]) and Honey and Mumford's, Learning Style Questionnaire (Jackson, [17]) have produced only ambiguous support for BTRSPI and Belbin's underlying model (Anderson and Sleap, [1]).

In spite of this, Belbin's ideas have been widely used by many UK organisations and management consultancies in both training and team development (Prichard and Stanton, [29]). The continuing research in Belbin's work is testimony to its influence in the study of team performance. Sustaining this has been evidential support in the literature for the link between team role balance and team performance (Senior, [30]). Watkins and Gibson-Sweet [35] established the link between role balance and successful project teams and Fisher et al. [12] showed that dividing team roles into either a 'task' or 'relationship' orientation could be used as a basis to predict team harmony and productiveness. This study aims to contribute to the on-going research into Belbin's team roles.

Team Role Balance and Team Development

Belbin [5] maintains that high performing teams need a spread of 'natural' occurring roles. These roles are identified in individuals with a score of 70 or above in the SPI. According to Belbin the degree of 'balance' in a team is the extent all nine 'natural' roles are represented. A team member could have more than one 'natural' role. Senior [30] believes that, while most team role theorists agree on the link between team diversity and team performance, the measurement of Belbin's team 'balance' is contentious. In an attempt to quantify 'balance' Partington and Harris [27] formulated Team Balance Indices calculated from the aggregate score of team members spread across all roles. They defined the degree of team balance, firstly, by the deviation from an ideal index (i.e. the maximum score per team role that could be achieved with a given number of team members), secondly, where a least one person scored high or very high in as many as possible of the team roles and, thirdly, where only one person scored high or very high in as many as possible of the team roles. The result of the use of these indices was a strong negative correlation ($p<0.01$) between the Co-ordinator (CO) Role and team performance. The researchers attributed this to the negative effects that COs have on teams. The presence of a strong CO led to dependency and the lack of preparation by others and COs tended not to contribute creatively in the team's operational processes.

The performance of teams has also been attributed to the level of team development within the group. Researchers have hypothesised that teams develop in a linear and progressive way. Notably one of the most well known team development model is Tuckman's [33] four-stage (Forming – Storming – Norming – Performing) model. A fifth stage (Adjourning) was later added in Tuckman and Jensen [34] and Maples [23]. A fuller discussion on team development literature and research can be found in Smith [31]. One of the aims of this study is to examine the relationship between team development and performance. Building on the team development research McFadzean [25] described a five-level model of team development associated with group performance in problem solving and decision-making. Team development was measured in their focus or 'attention' to task (level one), to the meeting process (level two), to team structure (level three), to team dynamics (level four) and to team trust (level five). This model suggests that differing team performance can be associated with differences in team development. While this does not tell the direction of the causal relationship, it is interesting to see if observed variations in performance are indicative of differences in team processes, structure or activities associated with the stages of team development or vice-versa. The team development models developed by Tuckman and Jensen [34] and McFadzean [25] in relation to team performance are explored in this study.

RESEARCH AIM

The aim of this paper is to build on the empirical research in Belbin's team roles. It follows from the team roles - team performance line of inquiry. The predominance of roles in a team is quantified by aggregating the individual role scores of its members. It is then possible to examine relationships between team roles 'tendencies' and team performance. In pursuing the team effectiveness line of inquiry this research takes cognizance that teams evolve over time and there is no reason to believe that all teams are at the same stage of development at the time their performances are measured. The research aims are distilled into seeking answers to two questions. Firstly, is there a relationship between the number and types of roles represented in a team and the team's overall performance? And, secondly, is there an association between team performance (and the roles represented therein) and its development stage?

METHODOLOGY

Sample

A sample of 342 out of a cohort of 851 management students from Victoria University of Wellington participated in the survey. The ethnic composition of students was 48.8% European, 37.0% Asian, 14.2% New Zealand Maori or Pacific Islanders. The gender distribution was 48% female and 52% male. These students were organised into 33 teams that participated in a management simulation conducted over two weeks. Team members had been assigned to their teams randomly without consideration of their team role preferences. They had been working as a group on various assessed tasks eight weeks prior to the management simulation.

Questionnaire

The Belbin Team Role Self-Perception Inventory was used in this research. This consisted of ten behavioural statements under each of seven sections. Respondents were asked to indicate their individual preferences by distributing ten points amongst these statements allocating more points to statements that reflected more strongly how they felt. They were asked to avoid allocating all ten points to one statement or one point to each statement in any section. The number of times a team role statement was selected and the allocation points would determine the respondent's team role preference.

Management Simulation

Each team operated as a management group planning the production of custom-made paper bags that had to be sold to customers, who were trained role-players. The teams had to plan the purchase of supplies from a supplier (a trained role-player), hire workers (played by other students) and negotiate a loan, if necessary, from a banker (a trained role-player). The teams' performance was measured by the profit the teams made at the end of the exercise. This performance formed a percentage of their management course marks and, as an assessed exercise; protocols were put in place to ensure consistence and impartiality in the performance of the role-players and in the conduct of the simulation.

Data Collection

Combinations of individuals have been shown to be 'desirable' for team performance (Belbin, [5]). However, the classification of individuals into their 'natural' and 'secondary' roles applies to relatively small teams of up to six persons. A study of larger teams, as in this study, required an analysis of the collective characteristics of team members (i.e. the number and intensity of characteristics individuals add to the team pool) as a possible determinant of team performance. This is done by scoring individuals on their team role characteristics and aggregating the scores within a team. Precedence for this methodology was established by Langbein and Lichtman [20], Hofstede [15], Leung and Bond [21] and Hofstede et al. [16].

In this study the role scores of team members were added for each team and the average role scores determined for all teams. The number of roles achieving an above average score was recorded. The higher the number of roles the more 'balanced' the teams were. The team performance was in profit secured at the end of the simulation. Teams were divided into four performance categories based on the team's ranking – low, low average, high average and high.

Each team was required to attend a focus group after the simulation. Team members were asked: *What went well and worked? What particular behaviours helped? What did not go well? What difficulties did you face? What behaviours hindered progress?* These were recorded in behavioural terms and provided qualitative data for this study.

Analysis and Results

The correlation analysis of team performance and team roles revealed significant positive relationships in the team performance ranking and the team's average role scores in PL, CO and TW. The results are in Table 2.

TABLE 2: CORRELATION BETWEEN AVERAGE TEAM ROLE SCORES AND TEAM PERFORMANCE RANKING

Belbin Team Roles	**Spearman's *rho***	**Significance *p < .05**
PL: Plant	.373	**.033***
RI: Resource Investigator	.293	.098
CO: Co-ordinator	.419	**.015***
SH: Shaper	-.089	.625
ME: Monitor Evaluator	.174	.332
TW: Team Worker	.360	**.040***
IMP: Implementer	.025	.892
CF: Completer-Finisher	.238	.182
SP: Specialist	.010	.955

However, this result does not indicate whether there is a relationship between team 'balance' and team performance. In order to do this, the number of roles teams scored above the average was compared with their performance ranking. The correlation analysis showed a one-tailed non-statistically significant relationship (*rho* = .258, p = .073) between the number of roles represented in a team (its balance) and its performance ranking. This result should be interpreted with caution given the small sample of 33 teams coupled with p < .10 result.

The second research question concerns the stages of development teams go through and whether team role requirements remain the same throughout. In a facilitated focus group after the simulation team members were asked to describe behaviours that assisted or hindered their group's performance during the planning and operating phases of the management simulation. The 33 teams were classified a priori into four categories of team performance – High (ranked 1-8), High-average (ranked 9-16), Low-average (ranked 17-24) and Low (ranked 25-33). The data from these groups were collated into perceived events or behaviours that positively or negatively affected performance.

In the High performing teams, members reported enthusiasm in taking on leader-defined management roles. They managed their time effectively working within their own remit. As a group, they worked well under pressure. These groups were hindered by argument amongst themselves, which precipitated from them being delegated work that was seen as inappropriate. They also reported insufficient time being allocated to planning the production process which was made worse by inefficient workers needing extra guidance and control.

High-average performing teams appeared to be people-centred. There was an emphasis on securing consensus, building morale and effective training. The outcome of this was more disagreements with the leader and more time required for decisions. Decisions that were eventually made were seen as being forced upon team members by their leader. The leadership of these groups were characterised as being risk-averse and lacking in direction.

Low-average performing teams reported discussion in determining managerial roles. In some cases members were selected to perform roles based on their work experience. Plans were followed closely with the view of optimising the used of resources and, where possible, learning from the experience of other teams. Poor performance was attributed to reluctance to take on the leadership role, a lack of job commitment of managers, a lack of communication amongst members and insufficient time and resources to get the job done.

Low performing teams appeared to have members who took the initiative in assuming leadership roles as well as in securing crucial information from outside the group. These teams initiated team members' 'training' and had done detailed planning of activities. However, team members seemed to lack self-confidence and confidence in their leaders when managing others.

Were the team role requirements different for teams at different stages of development as indicated by the behaviours in their performance categories? The average team role scores in each team roles were compared between the four performance categories. Each category was compared with the others. The results from six comparisons revealed statistically significant results in two comparisons. Table 3 shows the comparison of High and High Average performing teams. The High performing teams had a significantly higher SP score than the High Average performing teams.

TABLE 3: DIFFERENCE IN TEAM ROLE SCORES BETWEEN HIGH AND HIGH-AVERAGE PERFORMING TEAMS

Belbin Team Roles	High (N=8)		High Ave (N=8)		t-value (df=14)	t-test significance *p < .05
	Mean	Std Dev	Mean	Std Dev		
PL: Plant	3.241	.651	3.271	.640	-.093	.927
RI: Resource Investigator	4.012	.639	4.035	.820	-.060	.953
CO: Coordinator	3.432	.368	3.670	.805	-.758	.461
SH: Shaper	4.125	1.100	3.788	.559	.773	.453
ME: Monitor evaluator	4.036	.781	3.917	.470	.370	.717
TW: Team worker	3.997	.871	4.145	.692	-.373	.713
IMP: Implementer	4.312	.697	4.164	.550	.471	.645
CF: Completer-finisher	3.940	.922	3.864	.708	.184	.856
SP: Specialist	4.596	.787	3.925	.375	2.175	**.047***

The comparison between High and Low performing teams also revealed a significant result (Table 4). The Low performing teams had a significantly higher CO score than the High performing teams.

TABLE 4: DIFFERENCE IN TEAM ROLE SCORES BETWEEN HIGH AND LOW PERFORMING TEAMS

Belbin Team Roles	High (N=8)		Low (N=9)		t-value (df=15)	t-test significance *p < .05
	Mean	Std Dev	Mean	Std Dev		
PL: Plant	3.241	.651	3.737	.810	-1.381	.188
RI: Resource Investigator	4.012	.639	4.265	.542	-.881	.392
CO: Coordinator	3.432	.368	4.114	.639	-2.647	**.018***

SH: Shaper	4.125	1.100	3.534	.660	1.361	.194
ME: Monitor evaluator	4.036	.781	4.228	1.109	-.408	.689
TW: Team worker	3.997	.871	4.392	.646	-1.068	.302
IMP: Implementer	4.312	.697	4.301	.877	.027	.978
CF: Completer-finisher	3.940	.922	4.157	.893	-.493	.629
SP: Specialist	4.60	.787	4.451	.858	.361	.723

DISCUSSION

In this study there was no apparent relationship between the more 'balanced' teams and their performance in the management simulation. However, there were significant correlations between PL, CO and TW score and team performance. This suggests that teams that were more creative, had clear goals, co-ordinated activities and had members who were generally more co-operative achieved better results. Any one of these characteristics represented by the PL, CO and TW roles could be associated with differences in team performance.

High performing teams were characterised by trust, good communication, high commitment and good time management amongst team members. This finding appears to support McFadzean [25] assertion that better developed high performing teams reported trust between their leaders and team members (team trust'). There was a high level of commitment amongst team members through participation (team dynamics'). High Average team members in this research appeared to require more reassurances, encouragement and closer supervision. A significant positive difference in the SP role between these two groups suggests that more developed teams could do better with members taking on the specialist role.

Low performing teams were characterised by mistrust, a lack of commitment, and poor leadership. Teams at this stage of development teams were significantly higher in their CO role. This is contrary to the significant ($p < .015$) positive correlation between teams' CO scores and performance ranking. The empirical evidence here suggests that teams require different role set at different stages of development. It is conceivable that more goal clarification, delegation and coordination for teams at a 'lower' stage of development would impede performance. This observation supports Partington's and Harris' [27] findings on the negative effects of COs on team performance.

CONCLUSION

Team roles characteristics defined by creativity (PL role), good co-ordination (CO role) and good co-operation (TW role) measured collectively are correlated with team performance. There does not appear to be a statistically significant relationship between team 'balance' and team performance. However, there was a positive relationship between team performance and the stages of team development. The high performing teams are associated with the 'team trust' and 'team dynamics' stages of development. More work is required to establish definitive behaviours at each team development stage. The examination of the aggregate scores in relation to the level of team performance reveals that amongst more developed teams higher SP scores, which can be translated into having more relevant expertise in completing a task, are associated with better performance. While the CO characteristics are positively related to team performance, these characteristics can impede the performance of less developed teams. The association between team role characteristics, the stages of team development and team performance is a fertile ground area for further research.

REFERENCES (available on request)