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Control and Belbin's team roles

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Abstract *Consideration of Belbin's team role model led to the view that some of the roles proposed might require the exercise of control, but others much less so. A hypothesis which indicated which roles might be expected to manifest expressed and wanted control was developed and then tested using Schutz's FIRO-B questionnaire. A mixture of graduates in employment and undergraduates still at university were utilised as subjects for the investigation. After consideration of the validity of Schutz's constructs, the data obtained were construed as supporting the hypothesis and adding weight to the claims for the validity of the Belbin team role model.*

The issue of power and hence control in teams appears to have received insufficient attention within the academic literature. This became manifest when Sinclair (1992) gathered up some largely ignored research on team and work group behaviour and developed a challenging alternative perspective in respect to the exercise of power. Her perspective differed from the widely accepted (for example, Franz, 1998; Peters and Waterman, 1982) view, which holds that individual power needs can be accommodated within groups through containing or banishing power-seekers, or through the creation of an organizational environment which is permeated by a spirit of egalitarianism. She proposed that all group activity is a "consuming and irresolvable struggle for power" (p. 617). Subsequent and recent research lends support to her proposal. For example, Eisenhardt *et al.* (1997) found that a balanced power structure is a necessary component of effective management team decision making. Autocratic leadership generates high levels of interpersonal friction, whereas, at the other extreme, weak leaders precipitate interpersonal conflict because of the power vacuum at the top. Similarly, Peterson *et al.* (1998) discovered that senior management teams deliver bad decisions when there is extremely high leader strength, the absolutist cult. Conversely, successful decision-making groups had strong leaders who were open to dissent. A particularly clear demonstration of Sinclair's (1992) notion that all group activity is a "consuming and irresolvable struggle for power" is given in a study of a group-based production system adopted by a clothing manufacturer (Ezzamel and Willmot, 1998). Hostility developed within the groups when some team members refused to cooperate in delivering the extra production needed

to ensure that bonus targets were met. When persuasion and social pressure failed, the lack of power to control the behaviour of the non-cooperating team members precipitated extreme frustration and consequent dysfunctional behaviour.

If the seeking of power to advance individual ends is endemic in groups, as suggested by Sinclair (1992) and confirmed by research, examination of team models should uncover aspects of power and control. One well established team role theory is that of Belbin (1981, 1993), which has not, so far, been explored with regard to the dimension of power and control. If power and control do operate within Belbin's model, then the application of a psychometric instrument which can measure power and control to a group of subjects, whose team roles are already known, should confirm their presence. Indeed, if it were not possible to identify the dimension of power and control in the team roles, a significant question regarding the validity of Belbin's model would have been posited. In other words, from a consideration of individuals' Belbin team roles, a forecast should be able to be made regarding their attitude to control; if this were shown to be possible, then further confirmation of the validity of Belbin's team role model would have been established. This paper contains a description of an experiment conducted to test this hypothesis. Such a test, we contend, is required on account of the model's persistent widespread popularity and acceptance (Huczynski, 1997), even though substantial criticism (Furnham *et al.*, 1993a, 1993b; Broucek and Randell, 1996; Fisher *et al.*, 1996; Senior, 1997) has recently been directed at it. Should the presence of control be indicated within certain team roles, some support for the continuing use of the Belbin model will have been furnished. The additional insights into some previously unrecognised facets of the Belbin team roles should, also, be of help to practitioners.

FIRO-B

Access to data on control in teams and in groups is available through the application of the well-known (Hurley, 1990) fundamental interpersonal relations orientation (FIRO) theory proposed by Schutz (1958) and operationalized in the FIRO-B questionnaire. It has enjoyed widespread use and popularity; Hurley (1990) estimated that FIRO-B receives annually about 25 citations in the Social Science Citation Index, and Furnham (1990, 1996) has described it as one of the three most widely used questionnaires in occupational psychology. Schutz (1958) in his fundamental interpersonal relations orientation (FIRO) theory proposed three basic dimensions in interpersonal relationships: inclusion, control, and affection. Inclusion (I) refers to the need for belongingness and interaction. Control (C) indicates the need for power and influence. Affection (A) refers to the need for intimacy and friendship. Each is broken into two scales; one indicating the need to express (symbolised by the dimension e), the other the need to receive (symbolised by the dimension w). Six dimensions are thereby created: w^A , affection wanted; e^A , affection expressed; w^I , inclusion wanted; e^I , inclusion expressed; w^C , control wanted; e^C , control

expressed. These six FIRO-B scales have been the subject of several enquiries which have furnished somewhat contradictory evidence regarding their construct validity. Each of these enquiries has been reviewed by Macrosson (2000), who re-analysed the nine sets of reported interscale correlations. In conjunction with some fresh data collected by himself he factor-analysed all ten sets of interscale correlations individually and then combined the correlation data in a "bare bones" meta analysis. By this meta analysis he was able to show that the FIRO-B accessed only three constructs. The FIRO-B dimensions of w^A , affection wanted; e^A , affection expressed; w^I , inclusion wanted; e^I , inclusion expressed reflected only one underlying construct, which appeared to be the interpersonal super-factor of "warmth" described by Wiedemann *et al.* (1979). The other two constructs which emerged were w^C , control wanted, and e^C , control expressed; they appeared clearly to be orthogonal scales (Macrosson, 2000).

The main interest of this enquiry, however, is not with "warmth" but with the two control scales: w^C , control wanted, and e^C , control expressed. Schutz (1978) defined the interpersonal need for control as the need to establish and maintain a satisfactory relationship with people with respect to control and power. He indicated that control behaviour refers to the decision-making process between people. In order to amplify these sparse definitions Schutz (1978, p. 8) gave some terms to connote aspects of primarily positive control: "power, authority, dominance, influence, control, ruler, superior, officer, leader". Schutz has labelled his two control dimensions, w^C , control wanted, and e^C , control expressed, but an examination of the eight questionnaire items for the control wanted dimension shows that the dominant phrase is "I let other people. . ." It may be helpful, therefore, for readers to hold in the front of their mind the parallel idea that w^C , control wanted, could also be reasonably called "control accepted". Similarly, the questionnaire items relating to the dimension, e^C , control expressed, have the pattern, "I try to influence, take charge, be the dominant person, influence, have people do. . .", which suggests that a parallel title for this later dimension might reasonably be "attempted control". In spite of the appeal of using these alternative names there will be no departure from Schutz's nomenclature in this paper.

Hypothesis

Belbin's team role model (Belbin, 1981, 1993), which has now become the subject of increasingly extensive investigations (Furnham *et al.*, 1993a, 1993b; Dulewicz, 1995; Broucek and Randell, 1996; Fisher *et al.*, 1996, 1998; Senior, 1997), posits in its original form the existence of eight team roles, the presence of which is necessary for the optimal performance of a given team. These roles were titled completer, chairman or co-ordinator, company worker or implementer, monitor evaluator, plant, resource investigator, shaper, and team worker, names specifically chosen by Belbin to be free of prior associations in the minds of the users of his team role model. A list of the epithets describing each of these roles has been compiled from Belbin's (1981, 1993) writings and is

published in the literature (Fisher *et al.*, 1998, pp. 548-51). From these lists the epithets relating to control issues may be identified. Thus, the completer is variously described by Belbin as "anxious, conscientious, introvert, self-controlled, self-disciplined, submissive and worrisome". The completer as an introvert would not have a great propensity to express his or her will and a low score on the e^C , control expressed, that is attempted control, scale is anticipated. With regard to w^C , control wanted, that is accepted control, conflicting indications are encountered. "Self-control" and "self-discipline" may indicate that acceptance of control from outside would be unacceptable to the completer, yet the role is described as "submissive". In the light of such uncertainty no significant difference in scores between the two FIRO-B control scales is hypothesised. The chairman or co-ordinator, on the other hand, is described as "dominant, trusting, extrovert, mature, positive, self-controlled, self-disciplined and stable". This is one of the leadership roles in the Belbin model, so the aspects of "dominance" and "extroversion" in the profile of the chairman or co-ordinator signal a major interest in control and a high score on the e^C , control expressed, that is attempted control, scale. Such individuals can reasonably be expected to shy away from w^C , control wanted, that is accepted control, as is signalled in the "self-controlled" and "self-disciplined" epithets. A significant difference between the two FIRO-B scores may be expected; the w^C , control wanted, scores are expected to be smaller than those for e^C , control expressed. The company worker or implementer is described as "conservative, controlled, disciplined, efficient, inflexible, methodical, sincere, stable and systematic"; none of these epithets suggests a disposition to control others or a disposition to lightly accept control from others. No significant difference between the two FIRO-B scores is hypothesised. The monitor-evaluator team role is described as "dependable, fair minded, introvert, low drive, open to change, serious, stable and unambitious". The "introversion" and "low drive" epithets suggest low e^C , control expressed, that is, low control attempted, but in regard to w^C , control wanted, that is, control accepted, the Belbin description is silent. No significant difference between the two FIRO-B control scales could, therefore, be postulated for the monitor-evaluator team role. The plant is described as "dominant, imaginative, introvert, original, radical-minded, trustful and uninhibited". Although a dominant individual, the introverted nature of the plant would inhibit an expression of control; also, the radical and original individual is unlikely to accept control from others. No significant difference between the scales is hypothesised for the plant. The resource investigator is described as "diplomatic, dominant, enthusiastic, extrovert, flexible, inquisitive, optimistic, persuasive, positive, relaxed, social and stable". The combination of "extroversion" and "dominance" is, as was the case with the chairman role, likely to generate high e^C , control expressed, that is, control attempted, scores. The "positive" epithet may be taken as indicating a resistance to accept control, resulting in a low score for w^C , control wanted, that is, control accepted. A significant difference between the two FIRO-B control scales was postulated for the resource investigator team role. The task

leadership team role in Belbin's model is labelled the shaper; this role is characterised as "abrasive, anxious, arrogant, competitive, dominant, edgy, emotional, extrovert, impatient, impulsive, outgoing and self-confident" and can clearly be seen as connecting with the issue of control. "Arrogance" and "self-confidence" are taken as indicators of a reluctance to accept control from others. The e^C , control expressed, score is hypothesised as being significantly larger than that of w^C , control wanted. The last of the eight team roles is that of team worker. Characterised as "extrovert, likeable, loyal, stable, submissive, supportive, unassertive and uncompetitive", team workers would be expected to exhibit high w^C , control wanted, that is control accepted, scores on account of their submissive characteristics, and low e^C , control expressed, that is, control attempted, scores on account of their uncompetitiveness. A significant difference between the two FIRO-B control scales was postulated for the team worker role. All these suggested relationships are summarised in Table I. Finally, it will be noted that Belbin's ninth team role, that of specialist, has been excluded from the study. The specialist role, which Belbin (1993) introduced to his team role theory some time after its initial formulation (Belbin, 1981), related to the knowledge and skills which the team requires to perform its task. Since the specialist contributes on only that narrow front (Belbin, 1993), the omission of that role was not perceived as having a deleterious effect. Any impact which the individual with that role may have on the control issue will, in all likelihood, be random.

Method

An examination of the literature reveals three methods for deriving Belbin team role scores. In his first book Belbin (1981) provided the team role self-perception inventory, an ipsative questionnaire, which was easy to use and widely adopted (Furnham *et al.*, 1993a). Close examination of the team role self-perception inventory subsequently revealed it to be badly flawed (Furnham *et al.*, 1993a, 1993b; Broucek and Randell, 1996; Fisher *et al.*, 1996) and discontinuation of its use was later recommended (Broucek and Randell, 1996). The other two methods for deriving Belbin team role scores were based on personality questionnaires. The 16PF personality questionnaire was used by Belbin while developing his team role theory and the relevant conversion

Table I.
Hypothesised differences between the mean scores of the FIRO-B control dimensions e^C , control expressed, and w^C , control wanted, for each Belbin team role

Team role	Mean score
Completer	Not significant
Chairman	$e^C > w^C$
Company worker	Not significant
Monitor-evaluator	$e^C < w^C$
Plant	Not significant
Resource investigator	$e^C > w^C$
Shaper	$e^C > w^C$
Team worker	$e^C < w^C$

equations were subsequently developed for it and published by his group (Mottram, 1988; Life, 1993). These conversion equations which yield Sten scores for an individual's team role are available for both the 16PF5 and its predecessor, the 16PF4. The occupational personality questionnaire (OPQ) can also be used to derive Belbin team role scores. The development of the conversion equations for the OPQ (Saville *et al.*, 1992) was performed by Belbin subsequent to his work with the 16PF4 (Dulewicz, 1995). However, in a comparison of the 16PF4 and OPQ instruments Dulewicz (1995) administered both personality questionnaires to the same group of subjects and discovered that each instrument did not deliver closely similar team role scores for a given subject. Indeed, the correlation between the two personality questionnaires for each team role varied substantially: completer-finisher, $r = 0.42$; chairman, $r = 0.28$; company worker, $r = 0.40$; monitor-evaluator, $r = 0.13$; plant, $r = 0.27$; resource investigator, $r = 0.66$; shaper, $r = 0.49$; team worker, $r = 0.33$. In the face of such ambiguity the authors chose to employ the personality questionnaire used by Belbin (1981) in his original work, the 16PF4.

Two questionnaires were administered to 366 subjects, 84 of whom were employees of a large software house and were graduates or of graduate level in a variety of disciplines, and 282 of whom were undergraduate university students reading mixed discipline business degrees. Both the graduates and graduate level subjects (age $M = 31.4$ yrs; $SD = 8.7$; Male $N = 69$, Female $N = 15$) and the undergraduate subjects (age $M = 18.2$ yrs; $SD = 1.5$; Male $N = 107$, Female $N = 175$) completed Cattell's 16PF4 (graduate and graduate level subjects, Form C, and undergraduates, Form B, respectively) and Schutz's FIRO-B questionnaires. The graduates and graduate level subjects completed both questionnaires in consecutive sittings on the same day, whereas the undergraduates completed the FIRO-B one week after the 16PF4. The 16PF4 raw scores were converted to Sten scores using the appropriate UK general population norm tables (Saville, 1972) for males and females respectively. These Sten scores were converted into Belbin team role scores employing the usual formula (Life, 1993). The team role profile of each subject was then examined to ascertain the presence of a single strong team role; a Sten score greater than or equal to 7 was used as the criterion. All subjects not meeting this criterion or, to avoid ambiguity and confounding influences, showing more than one strong team role were discarded, thereby reducing the sample size by 109. The remaining subjects were grouped together according to their team role strength. A paired-samples t -test was performed on the FIRO-B scales of w^C , control wanted, and e^C , control expressed, for each of the groups using SPSS (Norusis, 1993) software. The heterogeneity of the variances of the pairs of the samples was examined employing the procedure given by Howell (1992, p. 191).

Results

Table II contains the means and standard deviations of the Belbin team role scores and the FIRO-B scales for w^C , control wanted, and e^C , control expressed, and the results of the paired samples t -tests. From the Table it is seen that six of

the eight hypothesised relationships were correctly forecast. The monitor-evaluator and team worker roles did not behave as predicted, although the direction of the statistically non-significant effect was correctly forecast for the monitor-evaluator role. The examination of the heterogeneity of the variances revealed that no significant difference in variance existed within each of the pairs.

Discussion

If the result obtained in this investigation is to be viewed as support for the construct validity of the Belbin team role model, the construct validity of Schutz's interpersonal relations model and his FIRO-B test first requires to have been demonstrated. In engineering parlance, unless the benchmark has been securely and accurately placed, how are fair measurements to be made? As presaged above, there has been some equivocation in the literature regarding the construct validity of FIRO-B. Indeed, Schutz's FIRO-B over its lifetime of four decades has not been universally applauded. Although it has enjoyed widespread use and popularity, Hurley (1990) estimating that FIRO-B receives annually about 25 citations in the Social Science Citation Index, and Furnham (1990, 1996) describing it as one of the three most widely used questionnaires in occupational psychology, it has drawn vehement criticism in respect of its construct validity (Ryan *et al.*, 1970; Hurley, 1990, 1991, 1992). Others have given it muted approval; for example, Lifton (1985, p. 579) wrote in the *Ninth Mental Measurements Year Book* that "the FIRO scales provide useful information concerning the nature of interpersonal relationships". However, a review of the evidence regarding the construct validity of FIRO-B and a meta analysis of the published correlation matrices has recently been reported (Macrosson, 2000), which now indicates that the two FIRO-B control scales each express orthogonal constructs. Employing FIRO-B as the benchmark for this study appears warranted.

Our hypotheses that the w^C , control wanted, scores would be greater in the monitor evaluator and team worker roles than the e^C , control expressed, scores were not supported by the data, the difference between the means of the scale

Table II.
Mean e^C , control
expressed, and mean
 w^C , control wanted
FIRO-B scores for
given Belbin team roles

Team Role	e^C , expressed		w^C , wanted		Difference in means		N
	Mean	SD	Mean	SD			
Completer	4.72	2.07	4.69	1.89	0.03	n.s.	29
Chairman	5.00	1.90	3.50	1.97	1.50*	$e^C > w^C$	16
Company worker	4.00	2.17	3.13	1.77	0.87	n.s.	15
Monitor-evaluator	3.60	2.30	4.60	2.41	1.00	n.s.	5
Plant	4.57	3.21	2.43	2.51	2.14	n.s.	7
Resource investigator	5.44	2.06	3.40	1.58	2.04**	$e^C > w^C$	25
Shaper	5.49	1.31	4.49	1.66	1.00**	$e^C > w^C$	41
Team worker	4.30	1.71	4.37	1.47	0.07	n.s.	119

Notes: * $p \leq 0.05$, one-tailed; ** $p \leq 0.005$, one-tailed; n.s. = not significant

scores being non-significant statistically. Examination of the data in Table II does show that the sample means of w^C , control wanted, in both cases were greater than the means of the e^C , control expressed, scores. A sample size of $N = 119$ for the team worker role would lessen any hope for the presence of a Type I error, but that is not the case for the monitor-evaluator team role, where the relatively large difference between the w^C , control wanted and e^C , control expressed scores is reduced to statistical non-significance by the small, $N = 5$, sample size. It is possible that a larger sample size would have revealed that the monitor-evaluator role is a w^C , control wanted, Belbin team role. In the hypothesis above it was argued that the team workers would be expected to exhibit high w^C , control wanted, that is control accepted, scores on account of their submissive characteristics, and low e^C , control expressed, that is, control attempted, scores on account of their uncompetitiveness. We suspect that the later part of that argument was suspect in that greater attention should have been paid to the extroversion than to the uncompetitiveness. Eysenk and Eysenk (1985) have clearly indicated that among the traits making up the type concept of extroversion is dominance, assertiveness and surgency. Had the team worker role hypothesis advanced above brought the extroversion aspect to the fore, a high e^C , control expressed, that is control attempted, score would have been proposed, and, consequently, a non-significant difference between the w^C , control wanted and e^C , control expressed scores. Given that these suggestions about the monitor-evaluator and team worker are correct, all of the hypothesis derived from Belbin's descriptions would have been supported from the empirical findings. It is also interesting to note that the four quadrants which can be created by plotting the w^C , control wanted and e^C , control expressed scales as intersecting axes are all populated by at least one Belbin team role. Such a distribution might reasonably be expected from a comprehensive team role theory. In this w^C , e^C quadrant diagram (not shown) the team worker is a high w^C , high e^C role, the chairman, shaper and resource investigator roles are low w^C , high e^C roles, the plant is a low w^C , low e^C role, and the monitor-evaluator is a high w^C , low e^C role. On account of the indeterminacy of the roles of completer and company worker with regard to either the w^C or e^C dimension they could not be assigned a quadrant.

Belbin (1981) proposed an interaction and relationship between pairs of team roles. He posited the idea of complementarity and counterbalance, pairing chairman with shaper, company worker with completer, plant with monitor-evaluator, and resource investigator with team worker, thereby producing a 4×2 typology. Thus, for example, he described the chairman as unifying and the shaper as driving the team, the plant sitting in the corner engaged in deep cerebral activity and the resource investigator out exploring. Dulewicz (1995) tested Belbin's 4×2 typology against team role data he had collected in the course of his validation study but found little support for it. In this study the chairman and shaper roles both have high e^C , control expressed, characteristics and are, therefore, likely to be engaged in a power struggle rather than in complementary and mutually supportive activities. The company worker and

completer roles were indeterminate with regard to their placing in the w^C or e^C quadrants. However, the two sets of roles which Belbin had paired, the plant and monitor-evaluator, and the resource investigator and team worker do appear complementary with regard to w^C , control wanted, that is control accepted. Thus, overall, our data lead us to agree with Dulewicz's (1995) conclusion; little support exists for Belbin's 4×2 typology.

With regard to the overall health of the team some conflict over the issue of control is perceived as normal and desirable. The "forming", "storming", "norming" and "performing" model of Tuckman (1965) predicts conflict in team formation as normal behaviour, and a balanced power structure within teams is perceived as vital to effective team performance (Eisenhardt *et al.*, 1997). It is clear that the Belbin prescription for the ideal team accommodates these notions. In addition, Wiggins and Trapnell (1997) have shown that instruments purporting to assess interpersonal behavioural constructs should consistently reveal the superfactors of dominance and affiliation. Since it is hard to conceive how any team role theory could not be concerned with interpersonal behaviour, some facet of dominance must be present. In this regard Belbin's theory was not found wanting.

The central aim of this paper was to provide evidence of the construct validity of the Belbin team role model through the testing of the hypothesis that team roles whose definition clearly indicate an involvement in power can independently be shown to have this involvement. Employing FIRO-B's control scales as a measure of power, a set of hypotheses was tested and evidence found to support them. We posit that the evidence constitutes a measure of support of the construct validity of the Belbin team role model.

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