**JOURNAL OF BUSINESS AND PSYCHOLOGY**
Volume 14, No. 2, Winter 1999

# THE RELATIONSHIP BETWEEN ORGANIZATIONAL CHARACTERISTICS AND TEAM BUILDING SUCCESS

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*ABSTRACT:* The present paper has three goals. First, an approach to meta-analysis which combines meta-analytic procedures with a more complete description of the organizational setting is presented. Second, a meta-analysis of the influence of team building on workgroup effectiveness is conducted. The results of this meta-analysis support the contention that team building impacts positively on workgroup productivity. Finally, a discussion of the role of meta-analysis in providing information which both scientists and practitioners may use to understand the relationship between organizational characteristics and the effects of team building on productivity measures is given.

Organization Development (OD) addresses problems involved in managing human dynamics in organizations (French, Bell, & Zawacki, 1989). The essential elements of OD: are "a powerful set of concepts and techniques for improving organizational effectiveness and individual well being" (French, Bell, & Zawacki, 1989: p. 1). An often used technique in OD is team building.

Team building is used with groups of interdependent individuals whose purpose is to accomplish common tasks (Porras & Robertson, 1992). Team building is designed to help work groups improve the way they accomplish tasks by enhancing the interpersonal and problem-solving skills of team members (Porras & Robertson, 1992; Porras & Silvers, 1991; Woodman, 1989). Team building is one of the most popular OD interventions (French, Bell, & Zawacki, 1989; Porras & Berg,

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1978; Porras & Robertson, 1992). A meta-analysis conducted by Neuman, Edwards, and Raju (1989) examined the effects of several OD interventions (including team building) in modifying satisfaction and/or other attitudes. Their review suggests that for specific interventions (e.g., interpersonal and problem solving), team building is an effective means of changing satisfaction and other attitudes.

However, Neuman et al.'s meta-analysis does not directly address the issue of whether team building impacts workgroup productivity. Several narrative reviews of team building exist (DeMuse & Liebowitz, 1981; Nicholas, 1982; Woodman & Sherwood, 1980) and have provided mixed results with regard to the effectiveness of team building for improving productivity or workgroup performance. One meta-analysis examined the general effect of OD on productivity and yielded moderate but variable effects (Guzzo, Jette, & Katzell, 1985). The Guzzo et al. (1985) review examined eleven psychologically based OD interventions but did not evaluate the effects of team building alone.

Thus, a meta-analysis on the effectiveness of team building on workgroup performance is warranted. The present study has three primary goals. First, the study will discuss an approach to meta-analysis which combines meta-analytic procedures with a more complete description of the characteristics of organizational settings. Second, a meta-analysis will be conducted on team building's effects on workgroup productivity measures. Finally, a discussion of the role of meta-analysis in providing information which both scientists and practitioners may use to understand the relationship between organizational characteristics and the effects of team building on productivity measures will be presented.

## META-ANALYSIS AND OD RESEARCH

Meta-analysis involves the systematic collection of documented studies relevant to some research question, converting the findings and characteristics of the studies to variables of interest through some coding scheme, and the analysis of these variables using robust statistical procedures (Glass, McGraw, & Smith, 1981; Hunter, Schmidt, & Jackson, 1982; Hunter & Schmidt, 1990). Meta-analysis treats the results of prior studies as individual data points in a statistical analysis. In meta-analyses done on organizational interventions the studies' findings are reduced to effect sizes, derived from experimental-control group mean comparisons or correlations between outcome and independent variables (e.g., Neuman et al., 1989; Rodgers & Hunter, 1991). Characteristics of the field sites may also be coded as moderator variables. The types of moderators used, however, may be of less help to the consultant

seeking to understand the efficacy of different interventions than they are to the academic researcher. For example, Neuman et al. (1989) in their assessment of the effects of OD interventions on attitudes and satisfaction examined only three moderators that might be of interest to the practitioner (the technology of the organization, the level of employees affected by the intervention, and the organization type). Rodgers and Hunter (1991), in their assessment of the effects of MBO on organizational productivity, looked at only one moderator (the level of management commitment to the program).

James, Demaree, Mulaik, and Ladd (1993) have proposed that the use of meta-analysis to understand the effects of organizational interventions would benefit from the use of a proactive research design in which moderating situational variables are defined *a priori* and later tested by a meta-analytic method. A variant of the meta-analytic approach which has been proposed for evaluating OD interventions and processes which emphasizes this *a priori* definition of situational moderators is the case meta-analysis method (Bullock & Tubbs, 1987). This paper proposes that the combination of the careful definition of organizational characteristics proposed by the case meta-analysis method (Bullock & Tubbs, 1987) with the statistical aggregation of diverse results from individual cases into a common statistic, the effect size (cf., Glass, McGraw, & Smith, 1981; Hunter & Schmidt, 1990) offers good possibilities for the understanding of the effects of OD interventions in real-world contexts. The next section shows how meta-analytic procedures, coupled with the *a priori* definition of organizational characteristics that may operate as moderators, provide data which can aid the practitioner in the prediction of the success of an intervention before implementation occurs.

## METHOD

### *Selection of Studies*

A search of the major psychological and business publications was conducted using two separate database systems (PsychLit and ABIN/inform). The key words, TEAM BUILDING and TEAM DEVELOPMENT, were used to create a pool of possible studies for inclusion in the meta-analysis. This resulted in a pool of 133 studies.

There were three criteria for inclusion used in this meta-analysis. First, the team building intervention had to fit Beer's (1976) conceptual scheme of team development or Dyer's (1977) description of the problem-solving team group. Beer (1976) described four models of team building: the goal setting model, the role model, the interpersonal model, and the managerial grid model. In the goal setting model, the team building ef-

fort is aimed at establishing group goals and plans to accomplish these goals. This model may be used to set goals for change in the group's structures and processes to meet organizationally set criteria (e.g., productivity measures). The role model approach consists of meetings to facilitate role clarity and decrease ambiguity. The interpersonal model focuses on improving interpersonal relations in the group. The assumption underlying this model is that an interpersonally competent group will be more effective than one which lacks such skills. The final model is the managerial grid model (Blake & Mouton, 1964).[1] Team building strategies that focused on problem solving as described by Dyer were also considered. While many studies have employed team building interventions consistent with Beer's (1976) descriptive scheme (e.g., Eden, 1985; 1986; Hughes, Rosenbach, & Clover, 1983; Mitchell, 1986), other studies have relied on a problem solving model as the primary intervention (e.g., Buller & Bell, 1986). The problem solving model reports a more general model in which team members identify major problems, generate relevant information, engage in problem solving, and implement and evaluate action plans. Such problem-solving interventions were coded as goal setting or interpersonal based on the relative emphasis placed on meeting group production goals or interpersonal competence. In addition, studies that used a combination of these interventions were considered for inclusion and coded as mixed to signify that more than one type of team building approach was used. Second, an inclusion criterion was that each study had to be conducted in a business or government field setting. Educational settings were *not* included due to the difficulty in operationalizing productivity. Finally, the third inclusion criterion concerned the dependent variables used in the study. Each study must have reported a change in objective productivity or a subjective estimate of group productivity made by someone in the group or external to the group undergoing the team building process. These dependent measures must have been reported as a quantitative statistic (usually an F- or t-value). This permitted the assessment of effect size of team building on productivity measures.

Based on the above criteria, 11 studies were selected and used in the ensuing analysis.[2] These 11 studies yielded 25 separate data points

[1]No studies using either the role or managerial grid approach met both of the second and third criteria for inclusion. Therefore, these types of team building are not included in this analysis.

[2]This number of studies may appear to be small but is consistent with that reported in other meta-analyses of team building interventions and/or OD's impact on productivity. For example, Guzzo et al. (1985) conducted a meta-analysis on 11 studies reporting the effects of multiple organizational interventions on productivity. Neuman et al. (1989) found only 23 studies of team building's effects on satisfaction and work attitudes (which are the more common dependent variables in the investigation of OD intervention results) (cf., Woodman & Sherwood, 1980). Most recently, Salas, Mullen, Rozell, and Driskell

for the meta-analysis (since some authors reported the effect of team building on multiple but independent productivity related dependent variables). The studies included in the meta-analysis are listed in Table 1 along with the research design, the primary focus of the intervention, the setting and subjects employed, the N size for each study, and the calculated effect size for each dependent variable.

*Method of Analysis*

The literature on statistical aspects of meta-analysis suggests there are a number of ways to calculate estimates of effect sizes. Glass (1976) proposed an estimation of effect size but presented no sampling theory for his procedures. Hedges (1981) demonstrated this estimate to be biased. An unbiased estimator of effect size based on a direct weighted linear combination of estimators from different studies has been developed (Hedges, 1982; Hedges & Olkin, 1985) and empirically tested (Hedges, 1982). Hedges' method has been shown to have the same asymptotic distribution as the frequently used maximum likelihood estimator but is simpler, more intuitively appealing, and involves less computation. Furthermore, Hedges (1982) has demonstrated that the distributions of the weighted estimator and the homogeneity statistic are quite accurate when the experimental and control group sample size exceeds 10 and the effect sizes are smaller than about 1.5, as was the case in the majority of the studies sampled here. Thus, the chosen meta-analytic technique was the chi-square method described by Hedges and Olkin (1985).

As an initial step, the appropriate N sizes and t values were found for each experiment. If a one degree of freedom F value was reported, it was converted to a t value. Each t value was then converted to an effect size ($d_i$) (see Table 1). The variance ($SE^2d_i$) for each effect size was calculated and used to compute a variance weighted mean for each effect size. The effect size is interpreted as the amount of change occurring within a dependent variable as a result of some independent variable (here the team building intervention) (cf., Glass et al., 1981; Hunter & Schmidt, 1990). The homogeneity of effect size hypothesis ($H_0$: $d_{i1} = d_{i2} = \ldots d_{ik}$) was assessed by computing an overall chi-square and testing it against a critical value ($\alpha = .05$).

(1997) conducted a meta-analysis of team building on performance. They searched the same sources this study did *and* included dissertations in their search. Their inclusion rules were slightly different from this study: They found 8 studies in their meta-analysis. Therefore, the number of studies included in the present analysis, while small, does seem indicative of the majority of the data base on team building's influence on productivity measures available to both practitioners and academics.

**Table 1**
**Summary of Team Building Investigations**

| Investigation | Research Design | Primary Intervention | Setting and Subjects | Dependent Variable | n* | Effect Size |
|---|---|---|---|---|---|---|
| Buller & Bell (1986) | Quasi-Experiment Non-Equivalent Control | Goal Setting | Hard rock miners in underground metal mine | Production quantity—tons per manshift | E = 36 C = 17 | .130 |
| | Quasi-Experiment Non-Equivalent Control | Goal Setting | Hard rock miners in underground metal mine | Production quality—grade of ore | E = 36 C = 17 | .642 |
| | Quasi-Experiment Non-Equivalent Control | Goal Setting | Hard rock miners in underground metal mine | Perceptual changes in grade of ore | E = 36 C = 17 | 1.096 |
| | Quasi-Experiment Non-Equivalent Control | Mixed | Hard rock miners in underground metal mine | Production quantity—tons per manshift | E = 18 C = 9 | .718 |
| | Quasi-Experiment Non-Equivalent Control | Mixed | Hard rock miners in underground metal mine | Production quality—grade of ore | E = 18 C = 9 | .839 |
| | Quasi-Experiment Non-Equivalent Control | Mixed | Hard rock miners in underground metal mine | Perceptual changes in grade of ore | E = 18 C = 9 | .866 |
| Eden (1985) | True Experiment | Mixed | Team members—logistics units in Israeli Defense Forces | *Perceptions of group effectiveness | E = 270 C = 270 | .086 |
| | True Experiment | Mixed | Team members—logistics units in Israeli Defense Forces | *Perceptions of organizational effectiveness | E = 270 C = 270 | .093 |
| Eden (1986) | Quasi-Experiment Non-Equivalent Control | Mixed | Combat company teams in Israeli Defense Forces | *Perceptions of group effectiveness | E = 220 C = 280 | .144 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Frielander (1967) | Quasi-Experiment Non-Equivalent Control | Interpersonal | Research and development groups in the armed services | *Perceptions of group effectiveness | E = 31 C = 60 | .298 |
| | Quasi-Experiment Non-Equivalent Control | Interpersonal | Research and development groups in the armed services | *Perceptions of individual effectiveness | E = 31 C = 60 | .238 |
| Howe (1977) | One Group Pre-Post Design | Mixed | Managers and technicians at a manufacturing plant | *Perceptions of group effectiveness | n = 9 | 2.615 |
| Hughes (1983) | Quasi-Experiment Non-Equivalent Control | Mixed | Cadet squadrons at U.S. air force academy who were working in organizations | *Perceptions of group effectiveness | E = 74 C = 62 | .386 |
| Kimberly & Nielsen (1975) | One Group Pre-Post Design | Interpersonal | Assembly line workers in automotive plant | *Perceptions of organization | n = 90 | .688 |
| | One Group Pre-Post Design | Interpersonal | Assembly line workers in automotive plant | *Perceptions of supervisor | n = 90 | .499 |
| | One Group Pre-Post Design | Interpersonal | Assembly line workers in automotive plant | Production rates by period | n = 90 | .081 |
| | One Group Pre-Post Design | Interpersonal | Assembly line workers in automotive plant | Quality units by period | n = 90 | .439 |
| | One Group Pre-Post Design | Interpersonal | Assembly line workers in automotive plant | Cost effectiveness—profit or loss by period | n = 90 | .272 |
| Mitchell (1986) | One Group Pre-Post Design | Interpersonal | MBA students and management teams in business | *Perceptions of group effectiveness | n = 28 | .549 |
| | One Group Pre-Post Design | Interpersonal | MBA students and management teams in business | *Perceptions of group effectiveness | n = 28 | .137 |
| Paul & Gross (1981) | One Group Pre-Post Design | Mixed | Communication and electrical division of the city of San Diego | Cost efficiency | n = 90 | .895 |

*Note.* •E = experimental group. C = control group.
*denotes average effect size of a composite measure.

## RESULTS

The overall chi-square value obtained in the present analysis was 67.58. The critical chi-square value at $\alpha = .05$ with 23 degrees of freedom is 35.17. A comparison of these two values leads to the rejection of the homogeneity of effect size hypothesis ($H_0$: $d_{i1} = d_{i2} = ... d_{ik}$). This result serves as an omnibus test for moderators: it suggests that more than one underlying distribution of effect sizes accurately describes the data. The case meta-analysis method proposes that organizational characteristics are an important determinant of the success of interventions in various cases. A list of 20 moderating organizational characteristics believed to be related to the success of team building interventions were generated. These moderator variables were based on discussions of change theory and team building presented in standard texts on organization development (Beer, 1980; Burke, 1982; Cummings & Huse, 1989). The moderating variables are given in Table 2.

These moderators may be organized into five categories. These categories are: (1) the process before the implementation of team building (e.g., the initiation and reason for team building, expectations regarding the intervention, and participation in planning the intervention); (2) the process of implementation of the team building intervention (e.g., the type of team building intervention, management of the intervention, and individual vs. group focus); (3) organizational support for team building; (4) organizational characteristics (e.g., type of organization, organization size, and general management style); and (5) the type of dependent variables used in the study (e.g., objective vs subjective).

The organizational characteristics were coded for each study. The decision rules defining these organizational characteristics were generated by the authors. Two raters then coded the organizational characteristic information available in each study. Initial inter-rater reliability was acceptable (91% agreement across all 20 moderator variables). Disagreements between raters were resolved through discussion among the raters and the first author. The final consensus coding of organizational characteristics was then used to test for moderators.

Table 2 provides information on (1) the sub-groupings used to code each organizational characteristic; b) the $\chi^2$ value for between-group differences on each organizational characteristic and the associated $\chi^2$ critical values; and c) the mean effect size for each sub-grouping of the organizational characteristics. The mean effect size represents the average amount of change in the dependent variable associated with each of these sub-groupings.

Table 2 shows that 19 of the 20 moderator variables tested had significant between-group differences. Only one moderator variable did not have significant between-group differences. This moderator was whether

**Table 2**
**Moderator Variables Examined**

| Moderator | $\chi^2$ *Between* Observed | $\chi^2$ *Between* Critical | n | $Md_i$ |
|---|---|---|---|---|
| The Process Before The Implementation Of Team Building | | | | |
| Who initiated team building | 3.867* | 3.841 | | |
| Internal to group | | | 7 | .431 |
| External to group | | | 18 | .781 |
| Rationale for team building | 16.318* | | | |
| Preventive action | | | 5 | .692 |
| Corrective action | | | 9 | .857 |
| No evidence | | | 11 | .536 |
| Expectations for team building benefits | 45.320* | 5.991 | | |
| To change performance | | | 9 | .785 |
| To change attitudes | | | 6 | .233 |
| To change performance and attitudes | | | 10 | .861 |
| Action research approach | 16.279* | 3.841 | | |
| No | | | 6 | 1.310 |
| Yes | | | 19 | .485 |
| Group involvement in team building plans | 11.665* | 3.841 | | |
| No | | | 8 | 1.068 |
| Yes | | | 17 | .501 |
| Team Building Process | | | | |
| Type of team building intervention | 11.091* | 5.991 | | |
| Goal setting | | | 3 | .622 |
| Interpersonal | | | 10 | .579 |
| Mixed | | | 12 | .785 |
| Were other interventions employed | 36.652* | 3.841 | | |
| No (team building only) | | | 12 | .534 |
| Yes | | | 13 | .820 |
| Who managed the intervention(s) | 33.647* | 5.991 | | |
| Internal consultant | | | 9 | .354 |
| External consultant | | | 14 | .741 |
| External and internal consultant | | | 2 | 1.755 |
| Level of focus | 5.404* | 3.841 | | |
| Individual | | | 6 | .477 |
| Intragroup | | | 19 | .748 |
| Organizational Support For The Team Building | | | | |
| Supervisory participation | .293 | 5.991 | | |
| No | | | 3 | |
| Yes | | | 20 | |
| No evidence | | | 2 | |
| Supervisory support of team building | 13.411* | 3.841 | | |
| No | | | 16 | .492 |
| Yes | | | 9 | 1.02 |

**Table 2 (*Continued*)**

| Moderator | $\chi^2$ *Between* Observed | $\chi^2$ *Between* Critical | n | $Md_i$ |
|---|---|---|---|---|
| Support of change effort | 10.783* | 5.991 | | |
| Support from higher levels | | | 7 | .901 |
| Support from different levels | | | 5 | .495 |
| No evidence | | | 13 | .637 |
| **Organizational Characteristics** | | | | |
| Organization size | 42.522* | 7.815 | | |
| Small (less than 500 employees) | | | 10 | .796 |
| Medium (500–5,000 employees) | | | 7 | .431 |
| Large (more than 5,000 employees) | | | 5 | .559 |
| No evidence | | | 3 | 1.100 |
| Organization type | 46.701* | 5.991 | | |
| Industrial/manufacturing | | | 16 | .890 |
| Government | | | 6 | .208 |
| No evidence | | | 3 | .527 |
| Group responsibility for performance | 31.103* | 5.991 | | |
| Groups were responsible for performance | | | 11 | .915 |
| Groups were interdependent | | | 6 | .760 |
| No evidence | | | 8 | .305 |
| Management style | 37.917* | 3.841 | | |
| Participative | | | 1 | 2.615 |
| Autocratic | | | 4 | .177 |
| No evidence | | | 20 | .687 |
| **Characteristics Of The Dependent Variable** | | | | |
| Type of performance measured | 14.741* | 3.841 | | |
| Objective | | | 11 | .663 |
| Subjective | | | 14 | .699 |
| Who makes the subjective report | 9.532* | 3.841 | | |
| Internal to group | | | 11 | .521 |
| External to group | | | 2 | .981 |
| Level of performance change reported | 21.225* | 5.991 | | |
| Individual | | | 4 | .468 |
| Group | | | 16 | .713 |
| Organization | | | 5 | .854 |
| Type of objective performance | 10.659* | 5.991 | | |
| Quantity | | | 5 | .804 |
| Quality | | | 5 | |
| Cost effectiveness | | | 2 | .895 |

*Note.* *$p<.05$. The mean effect size is not reported for non-significant moderators.

or not the immediate supervisor of the work groups participated in the actual team building process. The remainder of the presentation of results will be focused on the significant results in the five categories of moderators.

*Process Before the Implementation of Team Building*

These moderators may be divided into two general sub-categories. First, three moderator variables were used to assess the reason for, initiation of, and expectations surrounding the team building intervention. One moderator variable assessed where the initiation of the team building effort began. Team building efforts initiated by someone external to the work group (generally higher management) had a larger effect size than team building initiated within the work group (.781 to .431). A second moderator variable assessed the reasons for initiation of the team building intervention. Team building conducted as a corrective action had a larger mean effect size than team building conducted as a preventive action (.857 to .692). Third, management's expectations regarding what organizational criteria team building would affect was used as a moderator. If team building was conducted with the expectation of changing worker attitudes only, the smallest effect size was generated (.233). Expectations that team building would increase performance had an effect size of .785. Team building conducted with the expectations of improving both performance and worker attitudes had the largest effect size (.861).

The second sub-category was whether the work group receiving the team building participated in the planning of the intervention. The use of the action research model, in which the work group actively participates in the early stages of team building, decreased the effect size relative to not using this approach (.485 to 1.310, respectively). This was supported by a second moderator assessing whether the group was actively involved in planning the team building effort. Here, involvement in planning had a smaller effect size than did non-involvement (.501 to 1.068, respectively).

*Team Building Process*

This category of variables is concerned with the way the team building intervention was conducted within the studies. First, the type of team building used (based on Beer's (1976) typology) had differential effects on productivity measures. Team building efforts that used a combination (Mixed in Table 2) of methods had an average effect size of .785. Goal setting team building efforts alone had an average effect size of .622. Team building efforts with a focus on change in interpersonal skills had an average effect size of .579. The use of other interventions in combination with team building was also a significant moderator. Team building alone had an average effect size of .534 while team building combined with other interventions had an average effect size of .820. The management of the team building interventions by different types

of consultants also moderated effect sizes significantly. Team building efforts using only internal consultants had an average effect size of .354. Team building efforts using only external consultants had an average effect size of .741. Team building efforts using internal and external consultants had an average effect size of 1.755. The focus of the team building effort on individual change versus group change was another significant moderator. Team building focused on individual change had an average effect size of .477 while team building focused on group change had an average effect size of .748.

*Organizational Support for the Team Building*

This category of variables looked at the degree to which the support of organizational elements (outside the work group) affected productivity. The support of the immediate supervisor of the work group was an important moderator of the impact of team building on productivity. The average effect size for groups with this support was 1.02 while the average effect size for groups without this support was .492. The support of the change effort by different levels of the organization also proved to be a significant moderator. Support by higher levels of management had an average effect size of .901. Support from other levels of the organization (e.g., subordinates or peers) had an average effect size of .495.

*Organizational Characteristics*

Several general characteristics of the organizations in which the team building intervention was conducted moderated the effect sizes in these studies. The size of the organization was a significant moderator of effect sizes. Team building had an average effect size of .796 in small organizations (less than 500 employees); .431 in medium organizations (between 500 and 5,000 employees); and .559 in large organizations (more than 5,000 employees). The type of the organization in which the team building occurred was another significant moderator of effect sizes. Team building had an average effect size of .890 in industrial/manufacturing organizations and an average effect size of .208 in government organizations. The degree to which the performance of the team was independent of other elements of the organization also impacted effect sizes. Groups who were responsible for their own performance had an average effect size of .915 for the team building interventions. The average effect size was .760 for groups who were interdependent with other elements of the organization and not solely responsible for their own performance. The general management style of the organization in which the team building occurred also moderated the average effect size. The effect

size for the organization that could be classified participative was 2.615 while the average effect size for those classified as autocratic was .177.

*Characteristics of the Dependent Variable*

There were significant differences in effect sizes based on the types of dependent measures used in the studies. One variable that significantly moderated effect size was the type of productivity measures, objective or subjective, used in the studies. Objective measures of productivity had a mean effect size of .663 while subjective measures had a mean effect size of .699. Another significant moderator of effect sizes was who made estimates of change on the subjective productivity measures. The effect size for internal reports (made by team member(s) who participated in the change) was .521 while the mean effect size for external reports from other organizational members was .981.

The level of performance change reported was a significant moderator of effect sizes. Individual performance measures had an average effect size of .468, group performance measures had an average effect size of .713, and organizational performance measures had an average effect size of .854. Finally, the type of objective performance change measure was a significant moderator of effect size. Performance measures of quantity had an average effect size of .804, measures of quality had an average effect size of .713, and measures of cost effectiveness had an average effect size of .895.

## DISCUSSION

The results of this study are divided into three sections. First, information about the relationship between team building, change in productivity measures, and significant moderators of the use of team building is provided. Second, the results of this study are assessed for their consistency with the results of other studies of OD interventions. Finally, conclusions about the role of meta-analysis in providing practical information to OD practitioners can be made. Each of these issues will be discussed within the remainder of this paper.

## THE EFFECTS OF TEAM BUILDING ON PRODUCTIVITY

Team building does have a significant impact on change in productivity measures. The significant overall chi-square value found for this relationship supports this. Interestingly, the effects of team building on objective measures of productivity is close to its impact on subjective

measures of productivity (.663 to .699, respectively). This impact, however, is moderated by several characteristics of the field site in which the intervention occurs. The pattern of results found here allow the following general conclusions about team building's effects to be made.

First, there are several moderators that affect the impact of the team building process prior to its implementation. The effects of team building were increased when the intervention was initiated by a higher management level for *corrective reasons*. Second, the implementation process for the team building moderated the effects of the intervention. Team building interventions which combined different emphases, had the largest effect size. Using other interventions, in combination with team building, also increased the effects of team building. Therefore, while team building does improve productivity, it does so better in conjunction with other interventions. Team building conducted with both internal and external consultants had the largest effect on productivity. Focusing the intervention on group change (e.g., problem solving to improve work process as a group) had a larger effect than focusing on individual change (i.e., role definition for individuals in the group). Third, organizational support for the team building intervention was important. The support of the immediate supervisor also increased the effect of team building over that of groups in which this support was not present. Fourth, characteristics of the organization in which the team building was implemented moderated its effects. Team building had a larger impact on productivity in manufacturing than in government organizations. Team building had its largest effect in organizations of small size. Team building occurring in a more participative management climate had a larger effect than in those with an autocratic management climate. Finally, it was found that the type of productivity measures used as a dependent variable moderated the effect sizes. The focus of team building is the group. Therefore, team building should have its greatest effect on group measures of productivity. This study found that team building did indeed have greater impact on group and organizational level measures of performance relative to individual performance criteria. Team building also had its largest impact on productivity measures of cost effectiveness, followed by quantity and quality measures, respectively. Subjective measures were slightly more affected than objective measures. However, this does not necessarily reflect a self-serving bias on the part of the group participating in team building. Ratings of subjective measures by organizational members *outside* the work group had a larger effect size than those within the work group. Subjective measures given by external members of the organization may more accurately reflect effectiveness than those given by internal members of the group. This is a question which can only be answered, however, by studies using objective and subjective criteria in the same study. The degree to

which these findings are consistent with past OD research is addressed in the next section.

## CONSISTENCY WITH PRIOR OD KNOWLEDGE

The findings of this meta-analysis generally support the literature available on organizational change practice. First, the findings emphasize the support of the management in the successful implementation of team building. This is consistent with past research for other interventions (e.g., Rodgers and Hunter (1991) meta-analysis of MBO). This study extends this to show that all levels of managerial support are necessary in the successful implementation of team building. Higher levels of management must support the initiation of the team building efforts: Immediate supervisors must support the implementation of the team building effort as well if it is to succeed. Second, the findings that team building, in combination with other interventions, is more effective is consistent with the findings of Neuman et al. (1989) who showed that multi-faceted approaches to organizational interventions have the most impact on attitudinal variables. Third, the importance of understanding how interdependence affects workgroup productivity was shown. Team building was found to have a larger influence on productivity in independent work groups than in interdependent groups. Interdependence relates to the degree to which a workgroup must rely on others to produce output (Thompson, 1967). The focus of team building is usually the individual work group. It may be, therefore, that the most effective implementation of team building will typically require an intergroup intervention be paired with the team building to have the most effect since as interdependence increased, the effects of team building decreased.

These findings also are contradictory to some aspects of the traditional OD process. The findings do not provide support for the action research model as it is commonly used in the OD process. Participation of the group in the planning phase of the intervention and/or the use of an action research model decreased the effect of team building. There may be two primary reasons for this. First, this may be due to the corrective reasons for initiation of the team building interventions. The need to correct an existing problem may lead to pressure for fast action from the chosen intervention. Therefore, action research, with its emphasis on collaborative planning and consensus building, may take too long and not have the same degree of support (from management) that management-initiated team building does. Second, employees may feel more comfortable participating in the task-oriented problem-solving than they are in participating in the diagnosis and planning phases of the OD effort. This would be consistent with the findings that some peo-

ple do not want, and may resist, participation (Neuman, 1989). The desire for participation, therefore, may be more task-focused than is generally supposed in the OD literature.

## META-ANALYSIS AND OD PRACTICE

The present study used Hedges' method of meta-analysis (Hedges, 1982; Hedges & Olkin, 1985). This method allows the assessment of multiple moderators derived from an understanding of the organizational context in which an intervention occurs as advocated by James et al (1993). The testing of multiple moderators may provide more information to the practitioner for making predictions about future success of interventions than does traditional meta-analyses done on organizational interventions. This may be seen in a comparison between the results of this study and a meta-analysis investigating the relationship between MBO and organizational productivity (Rodgers & Hunter, 1991).

Rodgers and Hunter (1991) used the Hunter and Schmidt (1990) method of meta-analysis. The Hunter and Schmidt (1990) method makes it difficult to find significant moderators of effect sizes because of the logic underlying the method. This method assumes that there is an underlying relationship between the dependent and independent variables. This relationship is masked by statistical artifacts. If these statistical artifacts account for a significant portion of the variance (i.e., the 75% rule) in the relationship between dependent and independent variables, the need for searching for moderators is discounted. Individuals using these methods often do not spend time looking for moderators because they are, *a priori*, assumed not to exist (James, Demaree, & Mulaik, 1986). For example, the Rodgers and Hunter (1991) meta-analysis of the impact of MBO on productivity looked at *one* moderator of this relationship. The degree to which management supported the use of MBO was found to be a significant moderator of this relationship. No other moderators were assessed.

The practical value of the Rodgers and Hunter (1991) study for the OD practitioner is low. The commitment of management to *any* intervention as a necessary requisite for intervention success has been a given in theories of Organization Development and organizational change (cf., Cummings & Huse, 1989; Burke, 1982). This study supported the general finding of Rodgers and Hunter (1991). This study also, however, showed that while management support was necessary for the initiation of the team building effort, the support of the immediate supervisor for the team building effort was as important in the implementation of the effort. This is a more "fleshed-out" description of the role management support plays in OD interventions based on the assessment of *a priori* contextually de-

fined moderators. It may be, therefore, that for practical applications of a meta-analysis, the assumption should be made that moderators exist when conducting the study. The logic behind the Hedges and Olkin method (Hedges, 1982; Hedges & Olkin, 1985) may be more applicable to organizational change research than is the logic behind the Hunter and Schmidt (1990) method of meta-analysis.

One caveat to this proposal is the degree to which the effect sizes found by both methods are stable. The Hunter and Schmidt (1990) meta-analysis methods provide very stable estimates of the effect size of a moderator. The estimates provided by the Hedges and Olkin (1985) methods may, however, be less stable because of the multiple moderators being tested. For example, inspection of Tables 1 and 2 show that (1) the effects of the goal-setting approach to team building are based on one study (i.e., Buller & Bell, 1986) and (2) the effects of management style is based on coding only 5 of 25 data points for this variable. These are, potentially, very unstable findings. Other findings are more stable. For example, the effects of the moderator variables of (1) who initiated the team building; (2) expectations for team building efforts; (3) the use of the action research approach and group involvement in team building plans; (4) the use of other interventions; (5) who managed the team building effort; (6) level of focus; (7) supervisory support of the team building; (8) organization size; (9) organization type; (10) the type of performance measured; and (11) the level of performance change reported are all based on better distributions across studies and within the sub-groupings used. These findings are likely to be stable.

The two meta-analysis approaches are complementary. The purpose for which the meta-analysis is being conducted is the logical determinant of which is used. The Hunter and Schmidt (1990) method may be better suited to academic purposes. The Hedges and Olkin (1985) method, however, may be better suited to the needs of practitioners. Practitioners may be able to diagnose the configuration of organizational characteristics in the setting and use this information to make an *a priori* prediction of the expected effect of a specific intervention. For example, team building according to these findings should have its greatest impact when it is taken for corrective action on productivity measures related to cost-effectiveness for work groups which are: independent, have the support of management (including their immediate supervisor and higher management), work in manufacturing jobs in small organizations, and participate in management. Understanding how configurations of organizational characteristics affect interventions may prove valuable to the practitioner. The development of such a knowledge base which provides information on the match between organizational characteristics and intervention success should be a priority for organizational change researchers.

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