Total quality management and performance appraisal: an experimental study of process versus results and group versus individual approaches

SIMON S. K. LAM1* AND JOHN SCHAUBROECK2

1School of Business, The University of Hong Kong, Hong Kong
2Faculty of Business, City of Hong Kong, Hong Kong

Summary

This study investigated the effect of a process versus a results focus as well as a group versus individual-based approach to performance appraisals. Four experimental conditions were investigated, with dependent variables of appraisal satisfaction, perceived accuracy of the performance appraisal, expectations of performance improvement, and actual performance. The results showed that a process focus appraisal had a more positive impact than an exclusively results-oriented appraisal on ratee appraisal satisfaction, perceived appraisal accuracy, and expectations of performance improvement. Subjects receiving process appraisal feedback also showed a greater improvement in actual performance during a subsequent trial compared to subjects that did not receive process feedback. No differences were found between the group- and the individual-based performance appraisal conditions. Implications of these findings for appraisal processes in general, and total quality initiatives in particular, are discussed. Copyright © 1999 John Wiley & Sons, Ltd.

Introduction

Organizational practitioners and scholars have traditionally viewed the measurement of individual differences in performance as the primary purpose of performance appraisal (Dobbins, Cardy and Carson, 1991). From this perspective appraisal is essentially evaluative and developmental, serving the purpose of helping managers to make personnel decisions and to help employees better their performance and acquire skills they need for advancement. A key assumption of this approach is that the individual is capable of, and responsible for, influencing the way things get done in an organization. It is assumed the organization’s performance will then be improved by the aggregation of the individual improvements.

* Correspondence to: Dr Simon S. K. Lam, School of Business, The University of Hong Kong, Pokfulam Road, Hong Kong. Tel: (852) 2859 1008. Fax: (852) 2858 5614. Email: simonlam@hkucc.hku.hk

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A separate performance measurement function that has only recently received widespread attention is systemic. From this perspective, appraisal serves to identify the linkages between employee actions and unit-level outcomes. The information from appraisal is used to adjust organizational processes. System improvement within Total Quality Management (TQM) is to be achieved through teamwork and changes in business processes. Focusing on individual performance is seen to distract the organization’s effort to improve systematically (Dobbins, Cardy and Truxillo, 1988; Murphy and Cleveland, 1995). For appraisal to have positive systemic influences, raters must decide what organizational consequences are desired, make the necessary performance observations, and then deliver appropriate feedback to ensure that those consequences will come about. From a TQM or any other systems-oriented point of view, performance appraisal is first of all an instrument that facilitates organizational goal achievement. TQM initiatives are particularly concerned that appraisal enhances the effectiveness of work teams in their efforts to improve the performance of the organization as a whole.

As competition intensified on a global scale during the 1990s, more businesses as well as non-business organizations are adopting TQM as an overarching management philosophy to meet the demands of their customers and to ensure their survival. For these organizations, traditional approaches to employee appraisal were often found to obstruct the quality improvement efforts. Thus new approaches to performance appraisal have commanded attention, with the emphasis placed on improving system performance rather than measuring individual performance and goading individual initiative (Lawler, 1992). Unfortunately, however, there is little more than anecdotal evidence supporting many ‘alternative’ approaches to human resource management that are advocated by systemically-oriented practitioners and consultants. Thus we sought to employ a scientific methodology to examine some common prescriptions about performance appraisal contained in the literature of TQM and other systems perspectives. The study presented in this paper explored the effects of a focus on process rather than just results, and on group rather than individual performance, in performance appraisal.

Traditional Performance Appraisal

Because the emphasis of traditional performance appraisal is on measuring individual results, efforts to improve performance often tend to focus on individual differences rather than the constraints imposed by the overall system. Examples of such constraints include the leadership context, work process flow, and the organization design. A focus on faults of employees instead of systems is also seen to discourage the employee from seeking help from co-workers, and it encourages them to avoid challenges which may reveal personal performance weaknesses.

The traditional focus on measurable outcomes also leads supervisors to measure subordinates’ performance using quantitative indicators (Cammann and Nadler, 1976; Eccles, 1991). Thus performance outcomes that are less measurable in quantitative terms, such as quality improvement objectives, tend to be neglected. Performance measurements are linked to individual rewards, and hence the method and accuracy of measurements become sensitive organizational issues. Much time and effort are expended to refine appraisal instruments and to ensure the fairness of the measurement process. Employees are classified into performance levels based on the evaluation results. Very often, supervisors are asked to distinguish individuals, sometimes by methods such as ‘forced distribution’ and ‘paired comparison’. This displaces the focus of appraisal from the individual’s performance levels and his or her behavior on the job to a
comparison of co-workers on their overall perceived effectiveness. One result is rivalry among the employees which prevents them from cooperatively seeking means to system improvement (Ghorpade and Chen, 1995). A second undesirable result is upward-directed influence behavior. The latter has been conceived in terms of ‘influence costs’ that result in wasted time and energy owing to self-centered efforts to influence decision makers, inaccurate information provided to decision makers, and even blatantly unethical behavior serving the self-interests of employees subject to managerial oversight (Milgrom and Roberts, 1988). Proponents of TQM thus argue that traditional appraisal efforts are misdirected and should be refocused toward improving the performance of the system.

**TQM and Performance Appraisal**

Proponents of TQM (e.g. Bowman, 1994; Boudreaux, 1994) take an entirely different view of how performance appraisal should be conducted. TQM stresses the importance of the system rather than the individual as the critical factor in determining performance (Deming, 1986; Dobbins *et al.*, 1991). For example, Deming (1986) suggested that 80 per cent of performance problems are caused by system design and only 20 per cent are caused by ‘abnormal’ variations that may be linked to individual behavior (Deming, 1986). Deming (1986) went so far as to condemn performance appraisal as contrary to the management philosophy of total quality. Research has shown that performance raters do seem to have difficulty distinguishing systemic causes of employee performance from individual causes (Carson, Cardy and Dobbins, 1991). Despite their shortcomings, however, performance appraisals are recognized by most TQM proponents to serve vital functions in the management of human resources (Eckes, 1994). As business processes are rarely operated by single individuals, however, proponents argue that the evaluation of performance should be based on group rather than individual efforts and concentrate on the process of producing the results rather than the results themselves (Lawler, 1992).

Carson, Cardy and Dobbins (1992) argued that because work outcomes are the results of both system factors and personal behavior, employee performance should be evaluated on the basis of how the work is done as well as its results. By taking actions into account, the performance appraisal will aid in identifying the critical linkages between actions and results. This proposition has been tested by studying the interaction effects between feedback and goal setting on task performance. Earley, Northcraft, Lee and Lituchy (1990) distinguished two types of feedback: ‘outcome feedback,’ which concentrates on providing information on specific performance outcomes, and ‘process feedback,’ which provides information on the manner in which an individual implements a work strategy. They found that process feedback interacted with goal setting more strongly than outcome feedback in determining the quality of task strategies developed by workers and their efforts to obtain information beneficial to improving their performance. This evidence therefore partially validates the largely theoretical and anecdote-based arguments of TQM proponents about the critical nature of process-oriented appraisals.

Both outcome and process feedback can be expected to positively influence performance. By identifying the difference between targeted and actual work results, outcome feedback helps motivate and direct actions to adjustment performance strategies. However, since outcome feedback by itself does not provide information concerning how the outcomes were produced, employees are not equipped to learn what appropriate adjustments are required. Process feedback, on the other hand, focuses on the behavioral processes that generate outcomes and hence
facilitates the formulation of more effective task performance strategies. Process knowledge
draws attention to the fundamental success factors of an individual’s performance, thus
encouraging one to view his or her own work as part of a system.

A core principle of TQM is the emphasis on teamwork within and across work units. Group
performance should often be the focus of evaluation in order to lessen unproductive competitive
behavior within the team and to focus individuals’ attention to group rather than personal
objectives (Waldman and Kenett, 1990; Carson et al., 1992). Because a group can be made up of
people working on different parts of a business process, a ‘system perspective’ is more readily built
into a group’s performance evaluation criteria than into an individual’s. As noted by Dobbins
et al. (1991), group-based incentives are seen to ‘encourage employees to be more concerned about
the performance of their group and search for ways to cut costs and improve productivity’ (p. 30).
Although the idea of group evaluation has much prominence among those advocating systemic
approaches to human resource management, we know of no research that has explicitly examined
the effects of a group-based evaluation on employee reactions to appraisal.

The Present Study

The different approaches to performance appraisal proposed by TQM proponents raises the issue
of how effectiveness of the suggested appraisal methods might be evaluated. Jacobs, Kafry and
Zedeck (1980) suggested three potentially appropriate types of criteria. The first type of criteria
are concerned with the validity and reliability of measurements. An effective appraisal according
to these criteria will reduce common measurement errors such as halo effects, central tendency
and leniency. Their second set of criteria is called ‘utilization criteria’. These are concerned with
the ability of the performance appraisal system to generate information for management
decisions. Their third set of criteria is called ‘qualitative criteria’ and involves the reactions of the
raters and ratees. This includes the level of acceptance of the appraisal results and the perceived
fairness and accuracy of the ratings. Most studies on appraisal acceptance indicate that employee
acceptance will be maximized if the evaluation process is perceived to be accurate, the procedures
are implemented fairly, the appraisal goals are congruent with personal goals, and the raters do
not exceed their perceived authority (Carroll and Schneier, 1982; Farh, Werbel and Bedeian,
1988; Roberts, 1992). Satisfaction has been used frequently as a dependent variable in the studies
on employee reactions to appraisal (e.g. Russell and Goode, 1988). The advantage of this
measure is that it evaluates both affect and cognition, thus giving a broad indicator of an
individual’s reaction to the appraisal process. Based on the limitations of traditional appraisal
foci and the theoretical arguments favoring TQM-based approaches, we propose the following
hypotheses concerning appraisal acceptance:

\[ H1a. \] Employee satisfaction with performance appraisal will be higher when a process focus to
appraisal feedback is combined with results feedback, compared to appraisals which are
entirely results-oriented.

\[ H1b. \] Employee satisfaction with performance appraisal will be higher when group-based
appraisals are utilized, compared to individually-based appraisals.

A focus on task performance processes has also been argued by TQM theorists to aid
the supervisor and employee in understanding how the output is produced. Group-based
appraisals are likewise suggested to focus the attention of group members on systemic sources of performance variation. Both of these factors may thus lessen individual variations in performance:

H2a. Perceived accuracy with appraisal will be greater when appraisal feedback is focused on processes than when it is focused on results.

H2b. Perceived accuracy with appraisal will be greater when appraisal feedback is group-based rather than individually-based.

Since a process-focused appraisal will help employees understand how they can perform better, both the expected and actual performance may be more likely to improve. Indeed, research examining different methods for building worker self-efficacy, which is positively linked to motivation, has found that process feedback is an important element of the more effective forms of training (Gist and Mitchell, 1992). Self-efficacy is strongly linked to expectations of performance improvement. Of course, understanding the weaknesses and limitations of one’s previous task strategies can be an aid to improving them notwithstanding how this influences one’s self-efficacy.

In addition, group-based appraisal is expected to lead to less defensiveness and a greater understanding of how the group can perform more effectively. This, too, should improve expected and actual performance. These hypothesized effects are consistent with previous studies which found that a comprehensive measurement of organizational processes and feedback significantly enhanced work group productivity (Pritchard, Jones, Roth, Stuebing and Ekeberg, 1988, 1989; Jones, Buerkle, Hall, Rupp and Matt, 1993). In an extensive study of 240 municipal government performance appraisal systems, Roberts (1992) found that rater and ratee acceptance are significantly related to performance appraisal effectiveness. He concluded that acceptance determines to a large extent how the system can motivate employees, enhance productivity, reduce absenteeism, and help remove incompetent employees. In the light of these findings, we hypothesize:

H3a. Expectation for performance improvement will be greater when the appraisal is process-focused than when it is results-focused.

H3b. Expectation for performance improvement will be greater when the appraisal is group-based than when it is individually-based.

H4a. Actual performance improvement over repeated performances of a task will be greater following process-focused appraisal compared to results-focused appraisal.

H4b. Actual performance improvement over repeated performances of a task will be greater following group-based appraisal compared to individually-based appraisal.

The traditional emphasis on the psychometric properties of appraisal methods is waning somewhat. Organizational scholars have recognized an increasing need for research efforts centered on identifying the needs and preferences of the appraisees as well as their reactions to alternative forms of appraisal (Bretz, Milkovich and Read, 1992). Such research is especially needed at this juncture because of the many controversial claims about different appraisal methods that have come from advocates of customer-focused organizational change. These claims are not well-grounded in empirical research, and some, such as claims about the advantages of group-based appraisal, fly in the face of traditional wisdom. We were thus motivated by a desire to take such claims seriously and subject them to experimental investigation.
Research Method

Subjects

Junior front-line supervisors participating in a training seminar in Hong Kong were chosen as subjects in the experiment. The sample consisted of two groups of junior: supervisors attending a 2-day training seminar on quality management. Sixty (60) supervisors attended the first seminar and another 48 supervisors attended the same program 6 months later. The two samples were combined as they showed no marked differences in the measures of their personal characteristics. Subjects were required to participate in the experiment as part of their training. Included in the sample were staff from two conglomerates, five financial institutions, two trading companies, eight manufacturers, and three retail companies. Before the start of the experiment, each subject was asked to fill out a questionnaire which requested their personal demographics, educational background and work experience. The subjects ranged in age from 20 to 41 years with a mean age of 27.4 years, 73 per cent were female, 91 per cent had at least high school education, and 7 per cent had an undergraduate degree. Subjects had been employed in a full-time job from 4 to 19 years and had been in their present position from 2 to 9 years with a mean tenure of 6.2 years.

Subjects were randomly assigned to one of the four experimental conditions (process focus/team appraisal; process focus/individual appraisal; results focus/team appraisal and results focus/individual appraisal). Statistical tests were conducted on the measures of the personal characteristics of the subjects to ensure that the backgrounds of the subjects were not significantly different across the four experimental groups. These tests confirmed that the backgrounds of the subjects did not differ significantly.

Experimental procedures

The researcher introduced the experiment to the subjects as a session for assessing their learning skills of the participants. The subjects were told that they would be participating in a simulation exercise and that they would be role-playing a quality control employee involved in detecting defects on a printed circuit board (PCB). A printed circuit board is the basic component of many electronic devices. The quality of PCBs will have a significant effect on the performance of many electronic products. Conventionally, visual inspection of PCBs is done manually by inspectors and quality control applications such as statistical process control have already been widely used by many PCB manufacturers.

After the introduction of the experiment, subjects were asked to fill out a questionnaire which requested their personal demographics, educational background, and work experience. Then, a brief training session was given to familiarize subjects with the experimental task. Examples of four types of fault on the PCB were shown to the participants. Under the guidance of the researcher, the subjects were trained to identify these defects. After the subjects had learned to identify the faults, they were given trials on four paper copies of simulated PCBs.

After the training session, subjects were randomly assigned to an experimental group. Participants in groups of six then concurrently reported to a seminar room. Each subject was then asked to inspect 10 computer-simulated PCBs and to identify the various types of faults, if any, on the PCBs. All the subjects examined the same PCBs and were asked to write down the type of defect identified for each PCB on a decision sheet. Five PCBs were faultless and five had different types of defects which the subjects had learned to identify in the training session. The experimenter noted the time subjects began the experimental task, but did not give them a time limit for completing the
task. Subjects were asked to hand in their decision sheet immediately after the inspections. The time when they had completed the task was marked on the decision sheet.

After each subject returned the decision sheet, he or she was given a performance appraisal according to the experimental group to which they were assigned. The subject was then asked to complete questionnaires about the performance appraisal. Subjects returned for their second performance session 1 day later and repeated the same experimental task. While their performance with respect to the task of identifying faults on the PCBs was recorded, no performance appraisal was given after this session. Instead, a debriefing session was held for each group. This served to collect qualitative information regarding any questions, comments, or feedback about the experimental session.

The experiment is a 2 x 2 factorial design manipulating two independent variables: results focus versus process focus and individual versus team appraisal. In the individual appraisal, subjects performed the task alone and were not allowed to talk to each other during the experiment. In the case of the results focus appraisal, subjects were given an interview in which their performances were evaluated by the time required for completing the inspection of computer-simulated PCBs and the accuracy of their inspection. For the process focus appraisal, subjects were told that, in addition to their results in terms of fault detection, their performances would be evaluated by how well they understood the training session and the instruction sheet as well as whether they could suggest ways to improve the speed and accuracy of the PCB fault detection process. They were asked to fill in a simple questionnaire to test their understanding of the training session and the instruction sheet. They were also asked to write down any suggestions they thought could improve the PCB fault detection process.

In the individually-based appraisal condition, participants were evaluated on a 3-point scale (good, average and poor) and all subjects were given consistent feedback that was unrelated to their actual performance in order not to confound the feedback and the outcome measures (Wofford and Goodwin, 1990). The result was provided to each participant separately in a sealed envelope. They were asked to open the envelope immediately and were not allowed to show their result to other participants in the room. After they had read their results, subjects were asked to complete a questionnaire which measured their satisfaction, the perceived accuracy of the appraisal, and their expectation for performance improvement if they were to perform the same task again.

In the team-based appraisal condition, subjects were asked to work as a team of six and they were allowed to talk to each other and help each other during the experiment. They were also told that their individual scores would be averaged and they would be given a single evaluation for the whole group. In the case of the team-based/results focus appraisal, subjects were given an interview in a group where the time required for completing the inspection of computer-simulated PCBs and the accuracy of inspection of each subject were collected individually. For the team-based/process focus appraisal, the procedures were the same as for the individually-based/process focus appraisal, with the chief difference being that all feedback was provided to the group as a whole.

Measures

Satisfaction with appraisal
Satisfaction with appraisal was measured by a 5-item scale taken from Lawler (1981). Subjects responded by indicating their agreement or disagreement on a 7-point Likert-type scale. A sample item is: ‘I found the performance appraisal to be a satisfying experience’. The reliability (coefficient alpha) for this scale was 0.86.
Perceived accuracy of appraisal
Subjects’ perceptions of the accuracy of appraisal were assessed with a 5-item scale developed by Stone, Gueutal and McIntosh (1984). A sample item is ‘The appraisal was consistent with how I felt I performed on the task’. Coefficient alpha was 0.92 for this scale.

Expectation for performance improvements
Subjects’ expectations for performance improvements were assessed with a 3-item scale developed by DeGregorio and Fisher (1988). A sample item is ‘Given the same task again, I would do better’. Coefficient alpha was 0.78 for this scale.

Actual performance improvement
Subjects’ actual performance on the experimental task were assessed on two dimensions: (a) completion time—time required to complete the task, and (b) accuracy—the accuracy in the identification of faults on the PCBs. Completion time was measured by recording the time it took the participant to complete the task and was measured in minutes. To measure accuracy, the inspection results provided on the decision sheet by the participants were evaluated. Participants were awarded 1 point if the result of each inspection agreed with the solution. The highest possible score for each participant was 10 and the lowest possible score was 0. Subjects’ actual performance on the second session was assessed on the same dimensions and the actual performance improvement was calculated as the difference between the sessions.

Results

Manipulation checks
Checks on both experimental manipulations were included in the post-experiment questionnaire. To assess the process versus results appraisal manipulation, participants were asked whether they believed the performance appraisal was focused only on the performance results. A significant difference in mean score ($F_{1,106} = 6.74, p < 0.000$) was found between the experimental conditions (process and results focus appraisal). Next, the team versus individually-based appraisal manipulation was assessed using responses to a post-experiment question asking whether the subjects were evaluated individually. A significant difference in mean score was also found ($F_{1,106} = 7.32, p < 0.000$) between the two experimental conditions (team and individual appraisal).

Table 1 summarizes the means and standard deviations for the measure of satisfaction with appraisal, perceived accuracy and expectations for performance improvement across different experimental treatments. Table 2 presents the results of the ANOVA on the variables.

<table>
<thead>
<tr>
<th></th>
<th>Appraisal approach</th>
<th>Appraisal form</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Results focus</td>
<td>Progress focus</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>4.80 (0.64)</td>
<td>5.24 (0.93)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>4.87 (0.52)</td>
<td>5.28 (0.88)</td>
</tr>
<tr>
<td>Expectation</td>
<td>5.56 (0.82)</td>
<td>6.04 (0.97)</td>
</tr>
</tbody>
</table>

Standard deviation in parentheses.
Satisfaction with appraisal

It was hypothesized that participant satisfaction with performance appraisal would be greater in the process focus appraisal than the results focus appraisal. A two-way ANOVA revealed significantly higher mean satisfaction scores in process focus appraisal groups when compared with results focus appraisal groups \( (F_{2,104} = 8.471, p < 0.01) \), H1a was therefore supported. The satisfaction with appraisal in process focus groups was significantly higher than the results focus groups. It was also expected that participant satisfaction with performance appraisal would be greater in the team appraisal than in the individual appraisal groups A two-way ANOVA on the satisfaction scores revealed no significant difference in mean scores between team and individual appraisal groups \( (F_{2,104} = 0.524, \text{n.s.}) \). H1b was therefore rejected. A two-way ANOVA on the satisfaction with performance appraisal revealed no significant interaction effect \( (F_{1,104} = 0.254, \text{n.s.}) \) between the independent variables. This indicates that the effect of appraisal approach on satisfaction was not dependent upon whether there was team or individual appraisal.

Perceived accuracy of performance appraisal

It was hypothesized that the perceived accuracy of performance appraisal would be greater in the process focus appraisal than the results focus appraisal. A two-way ANOVA on the perceived accuracy of performance appraisal showed significantly higher mean scores for the improvement focus approach than the results focus approach \( (F_{2,104} = 8.631, p < 0.01) \). H2a was therefore supported. Groups with process focus appraisal perceived the appraisal with significantly higher accuracy than the groups with results focus appraisal. A two-way ANOVA on the perceived accuracy of performance appraisal revealed no significant difference between the mean scores in team appraisal groups when compared with individual appraisal groups \( (F_{2,104} = 0.642, \text{n.s.}) \). H2b was therefore rejected. There was no significant interaction effect \( (F_{1,104} = 1.214, \text{n.s.}) \) between the independent variables.

Expectations for performance improvement

It was expected that expectations for improved performance in the process focus groups would be greater than in the results focus groups. A two-way ANOVA on the expectations scores revealed significantly higher mean scores in process focus appraisal group than in results focus appraisal groups \( (F_{2,104} = 8.114, p < 0.01) \), H3a was therefore supported. The expectations for performance improvement in the process focus approach were significantly higher than in the results focus approach. It was also hypothesized that expectations for improvement would be greater in the team appraisal groups than in the individual appraisal groups. A two-way ANOVA on the expectations did not reveal significantly higher mean scores between the team and individual appraisal approaches.

Table 2. Two-way ANOVA results for dependent variable

<table>
<thead>
<tr>
<th>Source</th>
<th>Main effect appraisal approach</th>
<th>F</th>
<th>Source</th>
<th>Main effect appraisal form</th>
<th>F</th>
<th>Source</th>
<th>Interaction approach × form</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Source</td>
<td>F</td>
<td>etat^2</td>
<td>Source</td>
<td>F</td>
<td>etat^2</td>
<td>Source</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Satisfaction</td>
<td>5.333</td>
<td>8.471*</td>
<td>0.0721</td>
<td>0.365</td>
<td>0.5241</td>
<td>0.0049</td>
<td>0.154</td>
</tr>
<tr>
<td></td>
<td>Accuracy</td>
<td>4.481</td>
<td>8.631*</td>
<td>0.0754</td>
<td>0.484</td>
<td>0.642</td>
<td>0.0061</td>
<td>0.524</td>
</tr>
<tr>
<td></td>
<td>Expectation</td>
<td>6.259</td>
<td>8.114*</td>
<td>0.0701</td>
<td>0.712</td>
<td>1.025</td>
<td>0.0094</td>
<td>1.05</td>
</tr>
</tbody>
</table>

* Significant at 0.01.
The ‘Source’ column lists mean-square of variance for treatments.
The ‘F’ column lists F-ratio and indicates significant main and interaction effects.

appraisal groups \( (F_{2,104} = 1.025, \) n.s.\). H3b was therefore rejected. There was no significant interaction effect \( (F_{1,104} = 1.954, \) n.s.) between the independent variables.

**Actual performance improvement**

It was hypothesized that actual performance improvements would be greater in the process focus groups than in the results focus groups. It was also expected that actual performance improvements would also be greater in the team appraisal than individual appraisal groups. As two variables were used to measure the actual performance, these hypotheses were tested using a multivariate repeated measure analysis of variance with process versus results and team versus individual as the between subjects factor, performance by completion time an accuracy as the dependent variables, and time as the repeated factor. Means and standard deviations of performance improvement measures are shown in Table 3.

![Table 3. Means and standard deviations for performance improvement](image)

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competing time</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appraisal approach</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Results focus</td>
<td>23.51 (2.81)</td>
<td>20.44 (2.21)</td>
</tr>
<tr>
<td>Process focus</td>
<td>24.67 (2.41)</td>
<td>18.48 (2.01)</td>
</tr>
<tr>
<td><strong>Appraisal form</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group based</td>
<td>21.05 (2.32)</td>
<td>20.44 (2.06)</td>
</tr>
<tr>
<td>Individual based</td>
<td>22.06 (3.04)</td>
<td>19.60 (2.98)</td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appraisal approach</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Results focus</td>
<td>7.65 (1.17)</td>
<td>7.78 (1.08)</td>
</tr>
<tr>
<td>Process focus</td>
<td>7.62 (1.20)</td>
<td>7.84 (1.48)</td>
</tr>
<tr>
<td><strong>Appraisal form</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group based</td>
<td>7.84 (0.89)</td>
<td>8.01 (1.36)</td>
</tr>
<tr>
<td>Individual based</td>
<td>7.23 (1.20)</td>
<td>7.64 (1.34)</td>
</tr>
</tbody>
</table>

Standard deviation in parentheses.

A significant task trial effect was found on completion time \( (F_{1,215} = 6.257, p < 0.05) \). This indicates that in the second round subjects completed the same experimental task round quicker than the first time they performed the task. There is also a significant interaction effect between task trial and the process focus approach \( (F_{1,215} = 6.741, p < 0.001) \), showing that the process approach produces substantially greater reductions in completion time than for any other groups. However, there was no significant interaction effect with performance accuracy between task trials. H4a was therefore partially supported. There was also no significant interaction effect, \( (F_{1,212} = 1.831, \) n.s.) between the team versus individual approach and task trial on completion time and performance accuracy. H4b was therefore rejected.

**Discussion**

The results of the experiment concerning the effects of a process focus approach to performance appraisal were generally consistent with our hypotheses. Thus compared to the results focus
approach, the process focus appraisal was found to have a more positive and significant effect on appraisal satisfaction, perceived accuracy of appraisal, expected improvement, and actual results. No differences, however, were found between the effects of team and individual bases of evaluation.

The positive effects of the process focus approach are in line with the general arguments of TQM practitioners. Employees are more satisfied with a system in which the supervisors, in addition to evaluating their results, involve them in seeking improvements to the work process. This forms a foundation for further improvement which is reflected in the actual and expected performance of the employees. The higher perceived accuracy of the process focus appraisal may also help the employee to accept the evaluation as valid and be more willing to participate in the evaluation process. These findings are consistent with recent findings concerning how judgments of interactional fairness (an aspect of procedural justice) influence reactions to appraisal outcomes (Taylor, Tracy, Renard, Harrison and Carroll, 1995). Such attitudes and behaviors are conducive to employee involvement in making system-wide changes for better performance.

The hypotheses about differences in team- versus individual-based evaluation were not confirmed by the results. A number of factors besides the potential inaccuracy of the propositions themselves may have contributed to this. First, the teams in the experimental setting were created over a very short period of time. There was little chance for the groups to grow as functional teams with the concomitant development of performance norms (Gersick, 1988) and to develop positive group cultures. Group-based evaluation requires a high level of personal trust among members and trust requires time to develop. Second, the task of PCB fault detection does not have highly interdependent sub-tasks. Interdependence tends to make group work more effective than individual initiatives, and distributing outcomes competitively (as through individual appraisal) is found to create negative employee reactions primarily when interdependence among members is high (Shea and Guzzo, 1987). Finally, as suggested in many studies on group effectiveness (Hackman, 1990), a key ingredient of an effective team is a strong commitment to the group goals. In the current experimental design, it is doubtful whether such a strong commitment was created given the short duration of the task and the lack of rewards for performance.

While the general conclusion of the study supports TQM proponents’ pleas for a different approach to performance appraisal, it should be noted that outcome measures do have their roles in this alternative approach. TQM advocates generally are not recommending the abolition of outcome measures but rather that these measures should be linked to customer needs (Eckes, 1994). Supervisors and employees can work together to identify the key processes that generate the desired outcome. In addition it is recommended that performance appraisals should focus on the behaviors that make these processes effective in contributing to system objectives.

Future research in several areas could borrow from the current study. We found that the process focus appraisal improved satisfaction and performance relative to an entirely results-focused appraisal, but different mechanisms could explain how these improvements were achieved. It would be useful to carry out an analysis of the linkages between the evaluation process and the actual changes in the individual’s task strategies which lead to improvements in the results. Another logical extension of this study would be to replicate it using a different type of task, such as one that has more interdependent sub-tasks. Finally, cultural norms may influence how people react to different appraisal systems especially those that are based on a team setting (McEnvoy and Cascio, 1990). In a collectivistic culture such as the one found in Hong Kong (Hofstede, 1980), employees may more readily accept group-based appraisal and respond more positively to group goals. Thus it seems unlikely that the exact same experiment conducted in a more individualistic culture (such as are found in Europe and North America) would obtain more supportive results for our group versus individually-based appraisal hypotheses. Indeed, group-based appraisal is
increasingly utilized in these countries, and the findings of this study will not dampen concerns that group-based appraisal methods can potentially lead to negative employee reactions. There is a trend toward more systemic approaches to human resource management, and this would seem to be merited by changing organizational contingencies and a better understanding of employee psychology. However, more research is needed to determine if there are negative side-effects to the prescriptions made by quality improvement proponents which may counterbalance their salutary contributions to organizational effectiveness.

References


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