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Goal Orientation of Team Leaders: Its Effects on Performance and Group Interaction in Software Development Projects

Sabine Sonnentag, Michael Frese, Wolfgang Stolte, Torsten Heinbokel, and Felix C. Brodbeck

University of Giessen, Germany

Goal orientation is an action style implying the development of long-range and precise goals, and persistent pursuit of these goals. Goal orientation is not only important for a person's own performance but also for the performance of others in a co-operative work setting. This applies particularly to team leaders, whose goal orientation was predicted to correlate with both team performance and quality of group interaction within the team. In a sample of 44 team leaders and 141 other team members of software development projects it was found that team leaders' goal orientation is related to the quality of the development process, the quality of the final product, and the interaction within the team. This is true both for team leaders' estimates of the dependent variables and for aggregated scores of the team members' estimates. Interaction effects between team members' and team leaders' goal orientation were also found.

INTRODUCTION

Goal Orientation as an Action Style

Goals are essential for human actions (Frese & Sabini, 1985; Miller, Galanter, & Pribram, 1960; Volpert, 1987). A goal is an anticipation of a future situation. It renders a standard that allows one to interpret feedback

Requests for reprints should be sent to Sabine Sonnentag, Department of Psychology, University of Giessen, Otto-Behaghel-Strasse 10, D-35394 Giessen, Germany.

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on how far one has advanced and it determines the direction of actions taken. Goals are organized hierarchically. They vary in their concreteness, clarity, number and nature of subgoals, and in the amount of challenge that they pose (Frese & Zapf, 1994).

There are individual differences in the way in which and extent to which people set goals. Therefore, 'goal orienation' was established as an action style and conceptualized as a personality concept (Frese, Stewart, & Hannover, 1987). Goal orientation means to take one's goals seriously, and to know the details of what one wants to achieve, to have a long-range goal perspective, and to be persistent in pursuing the goal. Frese et al. (1987) showed that an individual's goal orientation was relatively stable over time and across various situations. In addition, goal orientation was found to be related to performance in students (Frese et al., 1987). Other studies have revealed the positive effect of goal orientation for various types of performance, usually in interaction with situational parameters (Frese, Albrecht, Kreuscher, v. Papstein, Prümper, & Schulte-Göcking, 1994).

Most of these studies refer to the relationship between goal orientation and performance within single individuals. So far, there have been no studies on the effect of a person's goal orientation in a co-operative work setting. The question arises as to whether or not a person's action style is related not only to his or her own performance but also has an impact on the performance of relevant others such as colleagues or subordinates.

It is of great practical importance to know whether or not a team leader's goal orientation is connected with the performance of his or her group. Such a relationship would have implications for issues of selection, compensatory strategies, and leadership training, if found to be true.

An area in which the importance of goals for the performance of others has been studied extensively is goal setting research. It was shown that specific and challenging goals lead to higher performance than no goals, easy, or "do your best" goals (Lee, Locke, & Latham, 1989; Locke & Latham, 1990; Locke, Shaw, Saari, & Latham, 1981; Mento, Steele, & Karren, 1987; Tubbs, 1986). The superiority of challenging and difficult goals was found not only in laboratory experiments but also in a broad variety of field settings.

Although there are clear connections between the research on goal setting and that on goal orientation, the concept of goal orientation must not be completely subsumed under the theory of goal setting. While goal orientation is conceptualized as a personality concept that is relatively independent of specific situations, goal setting theory focuses on the effect of setting specific and challenging goals in laboratory and field situations, and describes personality characteristics as moderators between goal setting and performance. However, it can be assumed that highly goal oriented people are more prone to set goals.

Importance of Goal Orientation for Team Leaders

An important task of leaders in work settings is to set and clarify goals for their subordinates and to provide them with a clear and engaging direction (Hackman & Walton, 1986; Yukl, 1989). It is necessary that the leader knows the goals, estimates them to be important, and insists on pursuing them even when difficulties occur. This is especially true for complex and ambiguous situations in which team members cannot rely on routinized skills and procedures (Kerr & Jermier, 1978; Yukl, 1989).

As goal orientation should have an impact on effort, persistence, and attention in individuals, this applies to work groups as well. The leaders' goal orientation should encourage the work group to stay on track, to persist, and to put effort into the process of working toward a goal. In a case study, Locke and Somers (1987) found that goal setting was essential for effective leadership. Locke and Latham (1990) reviewed other goal setting studies and came to the same conclusion. In a study with 253 managers, Boyatzis (1982) found that managers in the high performance group were more efficiency oriented, i.e. had more goal setting and planning skills, than were managers in the low performance group. Also, theories on transformational leadership stress the importance of a leader's mission and its communication for the performance of their subordinates (Bass, 1985). Thus, it can be assumed that team leaders with high goal orientation will be more vigorous in goal setting because they take their goals more seriously, specify them more, and are more long-range oriented than leaders with low goal orientation. Therefore high goal orientation in team leaders will have a positive impact on the performance of their teams.

In contrast to the well studied effects of goal setting on performance, little research has been done on the effect of goal setting on other variables like satisfaction or indicators of group processes. Studies on this topic show inconsistent results (e.g. Ivancevich, 1976; Jackson & Zedeck, 1982; Latham & Yukl, 1976). Locke and Latham (1990) argue that setting clear and specific goals enhances role clarity and harmony. Other effects of goals on group characteristics have also been found. For example, clear goals have been pointed out to be an important condition for group cohesiveness (Griffin & Moorhead, 1986). Anderson (1975) found that goal-path clarity in a laboratory setting resulted in higher interpersonal attraction and cohesiveness among the group members. Additionally, clear goals may keep group members on track and oriented towards the task and, thus, fewer conflicts and less competition may exist among the team members. Therefore, we assume that high goal orientation of the team leader is related positively to favourable team interactions.

One might argue that previous studies have found only weak relationships between the personality of leaders and their effectiveness (Landy,

1985; see also Lord, De Vader, & Alliger, 1986). However, most personality factors examined in other studies were relatively distinct from the tasks to be performed by the leader (i.e. intelligence, extroversion) while the personality concept of goal orientation as an action style is seen as a propensity to act. Therefore, it should show a closer relationship to the actions actually to be performed than do other personality variables.

Team Effectiveness as a Function of Team Members' Goal Orientation

Team effectiveness is not dependent only on team leading issues. Research on group effectiveness has shown that in addition to factors such as group composition and structure, task design, resources, and organizational structure (Gladstein, 1984; Hackman & Morris, 1975), goals also have an impact on performance. This was, for example, shown in a study by Pritchard, Jones, Roth, Stuebing, and Ekeberg (1988) in a natural work setting.

In general, there are two potential sources of goals and goal pursuit in work teams. On the one hand, high goals and consequent goal pursuit of them can be seen as a result of the team leader's behaviour, for example goal setting or other behaviour related to goal orientation. On the other hand, goal orientation among the team members is also necessary in order to pursue the goals and to show high performance. As highly goal-oriented individuals show better performance (Frese et al., 1987; Frese et al., 1994) and as group goals function in a similar way as individual goals (Shaw, 1981), it can also be concluded that teams composed of highly goal-oriented individuals outperform teams composed of members with lower goal orientation. Therefore, we assume that high goal orientation in team members is positively associated with team performance.

Summary of Hypotheses

1. It is hypothesized that goal orientation of team leaders is positively correlated with performance, i.e. quality of the development process and quality of the future product.
2. It is hypothesized that goal orientation of team leaders is positively correlated with positive social interactions within the team.
3. It is hypothesized that goal orientation of team members is positively correlated with team performance, i.e. quality of the development process and quality of the future product.

METHOD

Sample

A field study was conducted in 29 software development projects in 19 German and Swiss companies. The companies were contacted by mail and with the help of the German computer science association (Gesellschaft

fuer Informatik). Scientific and military projects were not included in the study because they were not subject to the same pressure as is the case for business projects. The software produced by the projects studied was planned for use by end users who were not software professionals. The produced software covered a broad application domain, including administration of small companies (38%), telephone and communciation purposes (21%), banks and insurance companies (17%), traffic institutions (10%), administration of big companies (10%), and process control (3%). While studied, 34% of the projects were in the phase of requirement analysis and software design, 28% were coding and testing, and 38% were in the phase of delivery and maintenance. The team size ranged from 3 to 18 members (mean = 10), the age of a team ranged from 5 to 33 months (mean = 14). On average, 74% of all the team members participated in the study (s = 26.3).

The total sample consisted of 200 people. Of these, 186 participated in a 3-h structured interview and 180 completed a questionnaire: both types of data were available from 166 people. Because no data from the team leaders of two projects were available, these projects were excluded from further analysis. The remaining sample consisted of 185 members in 27 software development projects; 44 of these were team or subteam leaders (in the following called team leaders), 141 were other team members. Characteristics of the team leaders and the other team members are presented in Table 1.

Measures

The subjects completed a questionnaire measuring goal orientation, their evaluation of the software development process, the quality of the future software product, and the quality of team interactions. Additional context variables and a team effectiveness measure were ascertained during the interview. All scales were in German. Means, standard deviations, and

TABLE 1
Characteristics of Team Leaders and Other Team Members

	Team Leaders (n = 44)	*Other Team Members* (n = 141)
Sex (%)		
female	25	24
male	75	76
Age (years)	34.8	32.6
Professional experience in software development projects (years)	7.5	4.7

reliabilities for the scales, as well as the medians of inter-rater reliability within the teams are shown in Table 2 (all results based on the entire sample).

Goal Orientation. This was measured with a scale developed by Frese et al. (1987). The scale comprised six items in a stimulus–response format (Endler & Hunt, 1966). For example, "I take all my goals very seriously" versus "My goals might be important, but sometimes I lose sight of them". In the present study, the subject were asked to relate their answers to a specific task, for example designing, programming, testing a module, or team leading. The subjects were asked to think about the task that had been identified in the preceding interview as performed most often during their individual work. They were asked to describe their usual behaviour.

While it might have been optimal to refer to the same situations for all subjects, due to project differences we thought that the major task should be determined individually and should be the one used as situational input into the goal orientation questionnaire. Frese et al. (1987) have shown that there is a certain degree of cross-situational generality in goal orientation. Actually, in this study, goal orientation did not vary across the various major tasks ($F(7, 165) = 1.00$; $P > 0.40$). For this reason, we are not concerned that the measurement of goal orientation is oriented toward different stimuli in different people (and then collapsed across them).

Process Quality. Two characteristics of the software developing process were ascertained in the questionnaire: Adequacy of scheduled time ("The time schedule shows an adequate relationship to the tasks actually to be performed") and time efficiency ("Time was spent in vain"—reverse scored). Additionally, team effectiveness was assessed in the interview by a single item (subjects' ratings from 0 to 10). An analysis by Brodbeck (1993) showed that the correlation between this team effectiveness measure and the success of the project assessed 6 to 12 months later was 0.58 ($P < 0.05$) at the team level.

Product Quality. The quality of the future product was assessed by two questionnaire measures: requirement congruency ("The product fulfills the requirements") and modularity. Modularity was measured with a three-item scale (e.g. "If a component is changed, it is known which functions are affected").

Team Interaction. The quality of interaction in the team was measured by a 22-item scale, constructed on the basis of items developed by Watson and Michaelson (1988) measuring aspects such as democracy (e.g. "We encourage reticent members"), openness to critique (e.g. "We take

TABLE 2
Means (M), Standard Deviations (SD), Medians of Inter-rater Reliability (IRR), Reliabilities, and Intercorrelations for All Variables

Variable	*M*	*SD*	*IRR*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Action style													
1 Goal orientation[a]	3.66	0.64	(—)	(0.66)									
Process quality													
2 Adequacy of scheduled time[a]	3.30	0.97	0.69	0.14	(—)								
3 Time efficiency[a]	3.54	0.85	0.75	0.20*	0.26*	(—)							
4 Team effectiveness[b]	6.56	1.82	0.80	0.26*	0.34*	0.32*	(—)						
Product quality													
5 Requirement congruency[a]	4.14	0.72	0.83	0.01	0.25*	0.25*	0.27*	(—)					
6 Modularity[a]	4.17	0.68	0.88	−0.06	0.25*	0.24*	0.25*	0.26*	(0.71)				
Team interaction													
7 Quality of interaction[a]	3.64	0.55	0.98	0.10	0.38*	0.36*	0.37*	0.33*	0.34*	(0.92)			
Context variables													
8 Project size	9.64	4.77	(—)	−0.02	−0.01	−0.21*	−0.16	−0.09	−0.07	−0.36*	(—)		
9 Phase of process[c]	2.03	0.87	(—)	0.04	0.16	−0.04	−0.03	−0.01	−0.05	−0.24*	0.30*	(—)	
10 User involvement[d]	0.48	0.51	(—)	0.18	−0.01	−0.10	0.01	−0.11	−0.11	−0.14	0.26*	0.14	(—)

Values in parentheses are reliability coefficients (Cronbach's Alpha). *n* varies from 80 to 180 depending on missing values.
[a]Variables scored such that 1 means very low and 5 means very high.
[b]Variable scored such that 1 means very low and 10 means very high.
[c]Variable scored such that 1 means early phase and 3 means late phase.
[d]Variable scored such that 0 means no user involvement and 1 means user involvement.
*$P < 0.01$.

criticism as a valuable contribution to our individual work"), low competition (e.g. "There are open hostilities among team members"—reverse scored), and low dominance (e.g. "Several team members tend to dominate discussions"—reverse scored).

Context Variables. As context variables may have an impact on the development process, the product, and the quality of interaction, project size (single questionnaire item), phase of the development process, and involvement of users of the future software product in the team were ascertained. The phase and user involvement were rated on the basis of descriptions given by the team members during the interview.

Data Analysis

The analysis of the relationships between team leaders' goal orientation and performance and interaction in the team was performed in three steps. First, team leaders' goal orientation was correlated with the team leaders' appraisals of team performance and their appraisals of quality of group interaction. In this analysis, the quality measure reported by the team leaders may be confounded with their goal orientation or other characteristics. Therefore, in a second step the team members' ratings of team performance and their perceptions of the team interaction were used as quality measures. For this, the scores were aggregated across all team members' (except the leaders) ratings. A similar procedure was suggested by Cooper (1981), who pointed out that individual rating bias can be avoided if group means for performance appraisals are used. Then, the team members' ratings of performance and team interaction were correlated with the team leaders' goal orientation. In projects with more than one leader, the average goal orientation of all of the leaders in this team was used.

As the use of aggregated scores is justified only if there is a certain agreement within each group (James, 1982), inter-rater reliabilities were computed for performance and team interaction measures. The computation was done on the basis of formulae proposed by James, Demaree, and Wolf (1984). We applied the single-item estimator for single-item measures, and the multiple-item estimator for scales, and obtained reliability coefficients for every team. The medians of these inter-rater reliabilities are shown in the third column of Table 2. The medians varied between 0.69 and 0.98, which justified using aggregated scores.

In a third step, potential effects of team members' and team leaders' goal orientation, as well as possible interaction effects, were analysed. An analysis of variance (ANOVA) was performed, separating high and low goal orientation by dividing the subgroups (separately for both members and leaders) at their respective means. Projects in which goal orientation

data were available from less than two members were excluded from further analysis, so that 25 projects remained for this analysis. A 2 × 2 ANOVA resulted. The two factors of were independent ($\chi^2 = 0.0340$; df = 1; $P > 0.80$). The performance and interaction scores aggregated across team members (excluding team leaders) were the dependent variables. Data were not available from all of the teams for two dependent variables; this reduced the degrees of freedom in these analyses.

RESULTS AND DISCUSSION

Goal Orientation and Team Leaders' Appraisal of Performance and Team Interactions

The results of the correlational analyses of team leaders' goal orientation and their estimates of quality are presented in the left-hand column of Table 3. Team leaders' goal orientation correlated significantly with nearly all measures of process and product quality. The higher a leader's goal orientation, the higher he or she evaluated the adequacy of scheduled time, time efficiency, team effectiveness, and requirement congruency. The correlation between goal orientation and quality of interaction was marginally significant.

As context variables might impact the correlations between goal orientation, performance, and team interaction, partial correlation coefficients

TABLE 3
Correlation Between Team Leaders' Goal Orientation and Process Quality, Product Quality, and Quality of Team Interaction

	Team Leaders' Goal Orientation	
	Appraisal of Quality Variables by the Team Leader ($n \leq 44$)	*Appraisal of Quality Variables by the Other Team Members ($n \leq 27$; aggregate scores)*
Process quality		
Adequacy of scheduled time	0.35*	0.26***
Time efficiency	0.46**	0.24
Team effectiveness	0.49**	0.64**
Product quality		
Requirement congruency	0.34*	0.31***
Modularity	0.17	0.06
Team interaction		
Quality of interaction	0.25***	0.29***

*$P < 0.05$; **$P < 0.01$; ***$P < 0.10$.

were computed using project size, phase of the development process, and user involvement as control variables. In general all correlation coefficients remained the same. The correlation between team leaders' goal orientation and quality of team interaction increased from 0.25 to 0.33 ($P < 0.05$).

Team Leaders' Goal Orientation and Aggregated Performance and Team Interaction Scores

The results of the second step of analysis are presented in the right-hand column of Table 3. Team leaders' goal orientation was correlated with the aggregated appraisals of performance and team interaction. Team effectiveness was highly correlated with team leaders' goal orientation. Other correlation coefficients were in the expected direction, three of them being marginally significant at the 0.10 level; this is not surprising because the total number of teams was small. For this reason, the clear-cut correlational pattern is even more convincing. Again, in general the correlation coefficients remained stable when project size, phase of the development process, and user involvement were used as control variables in partial correlation analyses.

As a matter of fact, the correlations of the aggregated scores showed a pattern similar to that found at the individual level. This indicates that there was a substantial relationship between the team leaders' action style and performance and interaction in his or her team. Additionally, it becomes clear that this relationship cannot be explained away by any potential response bias or context variables.

Interactions of Team Members' and Team Leaders' Goal Orientation

The third step—the ANOVA using team leaders' and team members' goal orientation as independent variables—showed that only team leaders' action style had an impact on the dependent variables (Table 4). There were no significant main effects of members' goal orientation with the dependent variables. This indicates that, in general, the average goal orientation in the team was of less importance for the project's success and the team interaction than team leaders' goal orientation.

However, there were two significant interactions for adequacy of scheduled time ($F(1, 21) = 7.23$; $P < 0.05$) and requirement congruency ($F(1, 20) = 5.74$; $P < 0.05$). Teams with highly goal oriented leaders showed more adequate scheduling of time than teams with low goal oriented leaders only if the goal orientation among the other team members was high as well (Scheffé's test, $P < 0.05$). If the team's goal orientation was low, there was no difference in the adequacy of scheduled time between teams with leaders having high or low goal orientation (Figure 1).

TABLE 4
Means of Measures of Process Quality, Product Quality, and Team Interaction as a Result of Team Leaders' and Team Members' Goal Orientation—Appraisal of Quality Measures by Aggregated Team Members' Scores

	Goal TL+		*Goal TL−*		*F-values*		
	Goal Team+ (n = 6)	*Goal Team− (n = 6)*	*Goal Team+ (n = 6)*	*Goal Team− (n = 7)*	*Goal TL*	*Goal Team*	*Goal TL × Goal Team*
Process quality							
Adquacy of scheduled time	3.67	3.09	2.53	3.17	5.875*	0.001	7.234*
Time efficiency	3.84	3.63	3.19	3.48	4.841*	0.037	1.817
Team effectiveness	7.67	7.83	6.30	5.83	15.196**	0.101	0.546
Product quality							
Requirement congruency	4.43	4.10	3.78	4.15	5.269*	0.026	5.744*
Modularity	4.23	4.21	4.08	4.26	0.099	0.164	0.271
Team interaction							
Quality of interaction	3.79	3.97	3.59	3.55	3.063***	0.192	0.433

Goal TL+, high goal orientation of the team leader; Goal TL−, low goal orientation of the team leader; Goal Team+, high average goal orientation of the team members; Goal Team−, low average goal orientation of the team members.

*$P < 0.05$; **$P < 0.01$; ***$P < 0.10$.

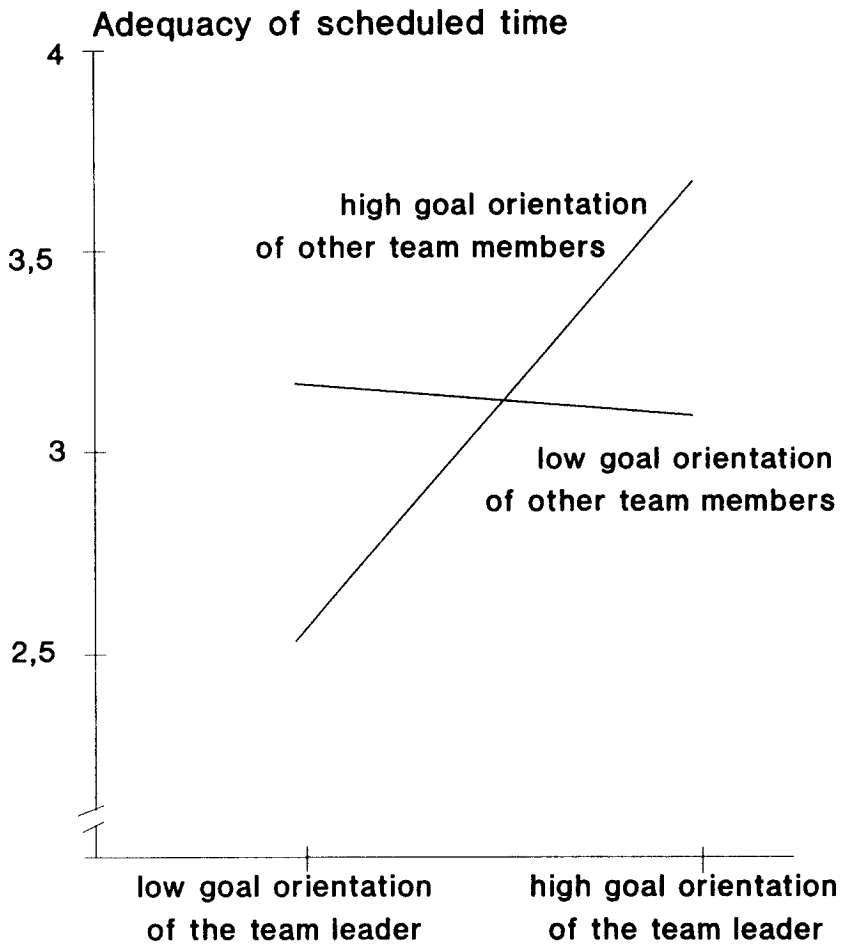

FIG. 1. Adequacy of scheduled time as a result of team leaders' and team members' goal orientation.

The same pattern was found for requirement congruency. The requirement congruency of a software product in a team with a highly goal oriented team leader was only superior to that of a team with a low goal oriented leader if the team itself showed a high goal orientation (Scheffé's test, $P < 0.05$). In general, all of the main and interaction effects remained stable when project size, phase, and user involvement were used as covariates in the analyses. Only the effect of team leaders' goal orientation on time efficiency did not reach the 0.05 significance criterion ($P < 0.10$).

Additionally, congruency of goals among team members was taken into account as covariate. Congruency of goals was computed as the agreement

within a team concerning features of the software product (e.g. changeability), by using the formula proposed by James et al. (1984). Again, all but one effect remained stable—only the interaction effect of team leaders' and team members' goal orientation on requirement congruency did not reach significance. However, the main effect of team leaders' goal orientation on requirement congruency remained stable.

The result concerning adequacy of scheduled time suggests that high goal orientation in the team has to be matched by a high degree of goal orientation in the leader. Otherwise, there is more loss in a high goal-oriented group than in a group with low goal orientation. It makes sense that such a tendency is strong for a performance measure that makes planning necessary—adequacy of scheduled time involves a high degree of planning—because the long-range orientation associated with high goal orientation plays a major role in the planning process. In retrospect it is not surprising that there is no effect of goal orientation on modularity because modularity of the software product may not be the goal of every project, but time efficiency or requirement congruency should be.

One might argue that highly goal-oriented team leaders pursued other goals than did low goal-oriented team leaders, and that the different *contents* of these goals are responsible for differences in performance and team interaction. In order to test this assumption team leaders were asked to rate the importance of eight software development goals (e.g. performance of product, reliability, user friendliness) on a five-point Likert scale. Team leaders were divided into high and low goal-oriented subgroups. The subjective importance ratings of their goals was compared with *t*-tests. No differences were found between the two groups of team leaders. This shows that the superior performance of highly goal-oriented team leaders cannot be explained by different contents of goals.

OVERALL DISCUSSION

The study revealed clear associations between a team leader's goal orientation and both the quality of the developmental process and the quality of the final product. A weaker—but still marginally significant—association between team leader's goal orientation and the quality of interaction among team members was also found. These results were achieved not only with the more subjective estimates of the team leaders, but also with the more objective aggregated scores of team members' estimates. As the use of team members' evaluations eliminates idiosyncratic responses and potential biases, considerable confidence can be placed in these results. The findings indicate that goal orientation of the team leader is of crucial importance for the performance of his or her team.

The results confirm the notion of Yukl (1989), who pointed out that 'clarifying', i.e. setting goals and communicating plans, is important in complex, unstructured, ambiguous, and changing work situations. These work characteristics are especially true for the field of professional software development, where cognitive and learning requirements are high (Brodbeck, Sonnentag, Heinbokel, Stolte, & Frese, 1993; Walz, Elam, & Curtis, 1993). In the beginning of a software development project the exact requirements of the software product are often not known, and may even change during the development process (Curtis, Krasner, & Iscoe, 1988). This makes the situation ambiguous. Therefore, high goal orientation in team leaders is necessary in order to clarify roles and objectives for their team members.

The assumption that team members' goal orientation would also be related to team performance was not supported by the data. One major explanation for this finding is that the work situation of regular team members does not require as much goal orientation as does that of team leaders. Furthermore, it was shown that high goal orientation in team members reduces performance unless goal orientation in team leaders is also high. This finding suggests that low goal orientation in team leaders ruins the effects of high goal orientation of other team members.

Additionally, the study showed that the concept of goal orientation is not only useful for studying performance within individuals (Frese et al., 1987; Frese et al., 1994), but also in co-operative settings.

Strictly speaking, the results cannot be interpreted causally. It could be possible that characteristics of the developmental process and the team interaction had an impact on the team leader's action style. This would mean that positive characteristics of the process in a project and good team interactions cause higher goal orientation in team leaders. However, such an interpretation seems unlikely. For example, it is not plausible that a bad requirement congruency or an inefficient use of time would cause a reduction in the leader's goal orientation. On the contrary, such situations could very well lead to higher awareness of goals and stronger goal pursuit. Additionally, if this causal direction was true, the question would be raised as to why positive process characteristics and favourable team interactions cause high goal orientation in team leaders but not in other team members. On the other hand, one cannot exclude the possibility that in a team with positive interactions, a team leader could better concentrate on the goals than is the case in a team that requires a lot of time spent on coping with conflicts.

An additional explanation uses the third variables argument. For example, personnel selection strategies operated by the company might lead both to high goal orientation in the leader and to better process and product quality. Further research is necessary here, but, again, it is unlikely

that this is the case. Such a selection process would also have led to a better match between leaders and team members on goal orientation, and this was not the case.

Although the question of causality cannot be answered, the study showed that goal orientation is an important issue for team leaders in project teams. It might be useful at this point in time to develop selection, training, and compensatory methods in order to increase leaders' goal orientation and to look for its potential impact on work processes and product quality in highly complex jobs.

REFERENCES

Anderson, A.B. (1975). Combined effects of interpersonal attraction and goal-path clarity on the cohesiveness of task oriented groups. *Journal of Personality and Social Psychology, 31*, 68–75.

Bass, B.M. (1985). *Leadership and performance beyond expectations*. New York: Free Press.

Boyatzis, R.E. (1982). *The competent manager. A model for effective performance*. New York: Wiley.

Brodbeck, F.C. (1993). *Kommunikation und Leistung in Projektarbeitsgruppen. Eine empirische Untersuchung an Software-Entwicklungsprojekten. Unpublished doctoral dissertation*. University of Giessen.

Brodbeck, F.C., Sonnentag, S., Heinbokel, T., Stolte, W., & Frese, M. (1993). Taetigkeits-schwerpunkte und Qualifikationsanforderungen in der Software-Entwicklung. Eine empirische Untersuchung. *Softwaretechnik-Trends, 13*(2), 31–40.

Cooper, W.H. (1981). Ubiquitous halo. *Psychological Bulletin, 90*, 218–244.

Curtis, B., Krasner, H., & Iscoe, N. (1988). A field study of the software design process for large systems. *Communciations of the ACM, 31*, 1268–1287.

Endler, N.S., & Hunt, J.M. (1966). Sources of behavioral variance as measured by the S–R inventory of anxiousness. *Psychological Bulletin, 65*, 336–346.

Frese, M., Albrecht, K., Kreuscher, R., v. Papstein, P., Prümper, J., & Schulte-Göcking, H. (1994). *Handlungsstile und Leistungsverhalten: Die Rolle von Plan- und Ziel-orientierung in Problem und Lernsituationen*. University of Giessen: Department of Psychology.

Frese, M., & Sabini, J. (Eds) (1985). *Goal directed behavior: The concept of action in psychology*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Frese, M., Stewart, J., & Hannover, B. (1987). Goal orientation and planfulness: Action styles as personality concepts. *Journal of Personality and Social Psychology, 52*, 1182–1194.

Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H.C. Triandis, M.D. Dunnette, & J.M. Hough (Eds), *Handbook of industrial and organizational psychology*, Vol. 4 (pp. 271–340). Palo Alto, CA: Consulting Psychologists Press.

Gladstein, D. (1984). Groups in context: A model of task group effectiveness. *Administrative Science Quarterly, 29*, 499–517.

Griffin, R.E., & Moorhead, G. (1986). *Organizational Behavior*. Boston: Houghton Mifflin.

Hackman, J.R., & Morris, C.G. (1975). Group tasks, group interaction process, and group performance effectiveness: A review and proposed integration. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, Vol. 8 (pp. 45–99). New York: Academic Press.

Hackman, J.R., & Walton, R.E. (1986). Leading groups in organizations. In P.S. Goodman (Ed.), *Designing effective work groups*. San Francisco: Jossey-Bass.

Ivancevich, J.M. (1976). Effects of goal setting on performance and job satisfaction. *Journal of Applied Psychology*, *61*, 605–612.

Jackson, S.E., & Zedeck, S. (1982). Explaining performance variability: Contributions of goal setting, task characteristics, and evaluative contexts. *Journal of Applied Psychology*, *67*, 759–768.

James, L.R. (1982). Aggregation bias in estimates of perceptual agreement. *Journal of Applied Psychology*, *67*, 219–229.

James, L.R., Demaree, R.G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, *69*, 85–98.

Kerr, S., & Jermier, J.M. (1978). Substitutes for leadership: Their meaning and measurement. *Organizational Behavior and Human Performance*, *22*, 375–403.

Landy, F.J. (1985). *Psychology of work behavior*. Pacific Grove: Brooks.

Latham, G.P., & Vukl, G.A. (1976). Effects of assigned and participative goal setting on performance and job satisfaction. *Journal of Applied Psychology*, *61*, 166–171.

Lee, T.W., Locke, E.A., & Latham, G.P. (1989). Goal setting theory and job performance. In L. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 291–326). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Locke, E.A., & Latham, G.P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice-Hall.

Locke, E.A., Shaw, K.M., Saari, L.M., & Latham, G.P. (1981). Goal setting and task performance: 1969–1980. *Psychological Bulletin*, *90*, 125–152.

Locke, E.A., & Somers, R.L. (1987). The effects of goal emphasis on performance on a complex task. *Journal of Management Studies*, *24*, 405–411.

Lord, R.G., De Vader, C.L., & Alliger, G.M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology*, *71*, 402–410.

Mento, A.J., Steele, R.P., & Karren, R.J. (1987). A meta-analytic study of the effects of goal setting on task performance: 1966–1984. *Organizational Behavior and Human Decision Processes*, *39*, 52–83.

Miller, G.A., Galanter, E., & Pribram, K. (1960). *Plans and the structure of behavior*. New York: Holt.

Pritchard, R.D., Jones, S.D., Roth, P.L., Stuebing, K.K., & Ekeberg, S.E. (1988). Effects of group feedback, goal setting, and incentives on organizational productivity. *Journal of Applied Psychology*, *73*, 337–358.

Shaw, M.E. (1981). *Group dynamics. The psychology of small group behavior*. New York: McGraw-Hill.

Tubbs, M.E. (1986). Goal-setting: A meta-analytic examination of the empirical evidence. *Journal of Applied Psychology*, *71*, 474–483.

Volpert, W. (1987). Psychische Regulation von Arbeitstaetigkeiten. In J. Rutenfranz & U. Kleinbeck (Eds), *Arbeitspsychologie* (pp. 1–42). Goettingen: Hogrefe.

Walz, D.B., Elam, J.J., & Curtis, B. (1993). Inside a software design team: Knowledge acquisition, sharing, and integration. *Communications of the ACM*, *36*, 63–77.

Watson, W.E., & Michaelson, L.K. (1988). Group interaction behaviors that affect group performance on an intellective task. *Group & Organization Studies*, *13*, 495–516.

Yukl, G.A. (1989). *Leadership in organizations*. Englewood Cliffs, NJ: Prentice Hall.