



AUTONOMY AND TEAMWORK IN INNOVATIVE PROJECTS

MARTIN HOEGL AND K. PRAVEEN PARBOTEEAH

The use of teams that incorporate autonomy in their designs continues to be an important element of many organizations. However, prior research has emphasized projects with mostly routine tasks and has assumed that autonomy resides primarily with a team leader. We investigate how two aspects of team autonomy are related to teamwork quality, a multifaceted indicator of team collaboration (Hoegl & Gemuenden, 2001). Specifically, we hypothesize that team-external influence over operational project decisions is negatively related to teamwork quality, while team-internal equality of influence over project decisions is positively related to teamwork quality. Testing our hypotheses on responses from 430 team members and team leaders pertaining to 145 software development teams, results support both predictions. Acknowledging the possible benefits of certain types of external influence (e.g., constructive feedback), the findings demonstrate that team-external managers of innovative projects should generally refrain from interfering in team-internal operational decisions. Likewise, the study shows that all team members should share decision authority, recognizing that their contributions to team discussion and decision making may well differ given differences in experience and expertise. © 2006 Wiley Periodicals, Inc.

The use of teams that incorporate autonomy in their designs continues to be an important element of modern organizations (Guzzo & Dickson, 1996; Langfred, 2000). Despite the broad array of prior work on autonomy and teams, the extant literature has not yet adequately addressed how team autonomy af-

fects the collaborative work process of teams with *innovative* tasks. In this research, we investigate how team and individual autonomy affect performance-relevant collaborative processes in innovative projects (Hoegl & Gemuenden, 2001).

Acknowledging the large number of studies examining the antecedents of team

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collaboration and team performance (e.g., Gladstein, 1984; Hoegl, Parboteeah, & Gemuenden, 2003; Hoegl, Weinkauff, & Gemuenden, 2004; Sicotte & Langley, 2000), the present study aims to make specific contributions to the literature by addressing the following gaps. First, the limited research addressing individual team-member autonomy highlights relationships with variables such as individual performance and job satisfaction (Spector, 1986), job motivation (Janz, Colquitt, & Noe, 1997), or team cohesiveness (Langfred, 2000). However, prior investigations have not produced a thorough understanding of how team and individual autonomy affect various elements of the collaborative team process such as task coordination, balance of member contributions to the team task process, mutual support, work effort, or the open sharing of information. These aspects of the team work process, however, have recently been shown to be important drivers of the performance of teams with innovative tasks (Hoegl & Gemuenden, 2001; Hoegl et al., 2003).

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Second, previous studies of team autonomy have focused on the transfer of decision authority from the team-external manager to the team, without further specification of the distribution of decision authority within the team (Cohen, Chang, & Ledford, 1997; Kirkman & Rosen, 1999; Manz & Sims, 1987; Wall, Kemp, Jackson, & Clegg, 1986). In this study, we address this relatively ignored issue by examining how the distribution of authority within the team is related to collaboration.

Third, previous research has addressed team autonomy for teams with more routine tasks (Cohen et al., 1997; Cordery, Mueller, & Smith, 1991; Janz, Colquitt, & Noe, 1997; Kirkman & Rosen, 1999; Langfred, 2000; Manz & Sims, 1987; Wall et al., 1986). Teams with innovative projects, however, have received relatively little research attention with regard to team autonomy.

Given the focus of prior studies and the gaps mentioned above, we investigate how team and individual autonomy affect the collaborative process of teams with innovative projects. To understand the effects of team autonomy in innovative projects, we consider both the team's autonomy from its external manager regarding operational project matters and the team members' equality of influence over project decisions (i.e., shared authority). As we describe in detail later, such truly team-level autonomy, rather than team-leader or team-member autonomy, corresponds to the high level of complexity and uncertainty inherent in innovative projects, creating pronounced interdependencies among team members that, in turn, require intensive intrateam collaboration.

This research thus extends previous analyses (Hoegl & Gemuenden, 2001; Hoegl et al., 2003) relating teamwork quality to team performance. Drawing on data from the same study, we investigate team-external influence over project decisions and team-internal equality of influence over project decisions as antecedents of teamwork quality.

Hypotheses

Team Collaborative Processes

In this research, we consider as our dependent constructs the process variables specified by Hoegl and Gemuenden's (2001) concept of teamwork quality. To capture the complex nature of team members working together, Hoegl and Gemuenden conceptualize and empirically validate teamwork quality as a higher-order construct with six facets: communication, coordination, balance of member contributions, mutual support, effort, and cohesion (for a later validation of the teamwork quality construct, see Easley, Devaraj, & Crant, 2003). The underlying proposition of this latent construct is that highly collaborative teams display behaviors related to all six teamwork quality facets. In teams with high teamwork quality, team members openly communicate relevant information (Katz & Allen, 1988), coordinate their individual activities (Faraj & Sproull, 2000), en-

sure that all team members can contribute their knowledge to their full potential (Seers, 1989), mutually support each other in team discussions and individual task work (Cooke & Szumal, 1994; Tjosvold, 1984), establish and maintain work norms of high effort (Hackman, 1987), and foster an adequate level of team cohesion where team members maintain the group (Gully, Devine, & Whitney, 1995; Mullen & Copper, 1994).

Team-External Influence over Project Decisions

Organizations interfere with team autonomy for many reasons. Sometimes, there is removal of team decision-making discretion because top management does not share an understanding of the product development process with the team (Clark & Wheelwright, 1992). This interference may take the form of higher levels of management requesting that they be consulted for major or minor (i.e., operational) decisions, thus representing a team-external influence on the project. Other reasons are that managers may not buy into the concept of team autonomy (Gerwin & Moffat, 1997a, 1997b). However, in addition to deliberate management attempts to limit team autonomy, loss of autonomy may also come from major changes in the environment. At the organizational level, major environmental hostility or rapid environmental change may lead to organizational crises. Often, organizations respond to such crises by centralizing decision making (Mintzberg, 1983), thus removing team discretion.

In this article, we look at a specific form of team-external influence—namely, the influence of management and other individuals within the greater organization on the team's activities. Specifically, we look at the degree to which team members need to consult with higher-level managers or outside individuals for operational decisions (i.e., decisions regarding its work strategies and processes, given set project goals and resource allocations). While some forms of team-external influence are sometimes beneficial because they provide important feed-

back to help project completion or encourage creativity within the team by discouraging groupthink, we argue that the specific type of team-external influence considered here is detrimental to teamwork in innovative projects.

Relative to more routine projects, innovative projects involve comparatively high levels of uncertainty and ambiguity, along with a crucial and ongoing need to collect and share information in order to resolve problems (Sicotte & Langley, 2000). Such information sharing and task coordination within the team, however, is likely reduced in cases of strong team-external influence over project decisions, as technical and coordinative information is more likely channeled to the team-external decision maker (e.g., team-external manager). Drawing from the information-processing perspective on the organizational level (Daft & Lengel, 1986; Nadler & Tushman, 1988), such hierarchical structures between the team members and the outside persons or groups likely decrease collaborative processes within the team as communication increasingly flows vertically rather than horizontally. If the team, however, has a high degree of autonomy over project decisions, team members are reliant upon themselves for task decisions, which will likely increase the sharing of information as well as the coordination of task activities horizontally within the team.

It is also likely that when decisions are made outside the team, such decisions reflect outside perspectives. If the team members feel that the project reflects largely external demands, then they are less likely to identify with the project (Sethi, 2000). Such lower identification is likely to decrease team members' willingness to fully contribute their knowledge to problem-solving processes (i.e., "bal-

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ance of member contributions" in Hoegl and Gemuenden's [2001] terminology). If team members feel that decisions are being imposed on them, they are less likely to contribute their own knowledge to bringing the project to successful completion.

Moreover, team-external influence on project decisions may also signal to team members that external managers do not buy into the team autonomy idea (Gerwin & Moffat, 1997a, 1997b) or do not trust the team to be able to make such decisions. Both cases are likely to result in team members'

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lower satisfaction with the team (Kirkman & Rosen, 1999) and lower commitment to the team (Wall et al., 1986). Cohen (1990) showed that top management's involvement in operational decision making undermined the team members' feelings of authority, responsibility, and accountability. This involvement, in turn, is likely to be associated with lower cohesion and effort. Furthermore, as self-reliance in more autonomous teams is replaced with team-external decision making in less autonomous teams, the likelihood for sincere and constructive discussion within the team on operational project matters is likely reduced (if not to say largely preempted) by outside decision making. Instead, team members turn to those influential team-external people or groups for task decisions as well as guidance and support in carrying out their work.

Given all of the above, we hypothesize:

Hypothesis 1a: Team-external influence over project decisions is negatively related to teamwork quality.

Hypothesis 1b: Team-external influence over project decisions is negatively related to all six teamwork quality facets (i.e., communication, coordination, balance of member contributions, mutual support, effort, and cohesion).

Team-Internal Equality of Influence over Project Decisions

We define team-internal equality of influence over project decisions as the degree to which all team members jointly share decision authority, rather than a centralized decision structure where one person (e.g., the team leader) makes all decisions or a decentralized decision structure where all team members make decisions regarding their work individually and independently of other team members. It is important to note that team-internal equality of influence over project decisions does not imply that all decisions in the project must be made jointly with equal involvement by every team member. Rather, teams can decide to delegate authority over certain decisions to individuals or subgroups within the team, given individual team members' specific expertise or experience. Furthermore, this variable is independent of whether or not a team has a formal team leader.

Although equality of influence may not always be beneficial, as sometimes it is necessary for some members to have more influence than others, the nature of innovative projects with individuals from various cross-functional areas suggests that team-internal equality of influence over project decisions is positively related to teamwork quality. We argue that team-internal equality of influence over project decisions provides a favorable setting for team members to openly share technical and coordinative information and engage fully in problem-solving processes. If the members of a team share the authority to make decisions within the team, then team members are dependent upon one another in jointly finding solutions to problems that arise in the project. Such interdependence in decision making mirrors the interdependence inherent in innovative tasks, where complexity and uncertainty make it necessary for individuals with diverse knowledge and skills to interactively find solutions to novel problems, as these cannot be adequately preprogrammed (Hoegl & Gemuenden, 2001; Sicotte & Langley, 2000).

The interdependence created by team-internal equality of influence over project deci-

sions provides both the necessity and the opportunity for team members to participate with their ideas and contributions in the process of resolving issues and making decisions (Ford & Randolph, 1992). This effort results in a more open exchange of information, closer coordination of tasks, and a better balance of team-member contributions, such as all team members contributing to team problem solving to their full potential (Zachary & Krone, 1984). It is important to note that balance of member contributions (as a facet of teamwork quality) does not mean equality of input to the project (Hoegl & Gemuenden, 2001). Depending on team-member characteristics, such as the nature of their expertise or their relevant experience, some team members are likely to contribute more than others. We do advance, however, that team-internal equality of influence will promote such (relative) balance of team-member contributions, which in turn is a central aspect of cross-functional project teams.

If team members are allowed to make decisions jointly, they are also likely to develop higher levels of support and trust for each other (Sethi, 2000). Additionally, individuals making decisions jointly are more likely to feel that their ideas are worthy and valued by colleagues. As such, they may further their commitment to the team and their fellow teammates, resulting in increased team cohesion and mutual support. Furthermore, joint decision making improves team members' identification with the (joint) decision. Thus, team members will be more likely to put greater effort into the implementation of decisions in which they have had an active role (Vroom, 1987). As such, if team members feel that the project is a result of their own ideas and influence, they are more likely to be attached to the project and its objectives (Ford & Randolph, 1992; Zachary & Krone, 1984), develop higher levels of support and trust for each other (Sethi, 2000), and establish a positive affective tone among the project members (Wech, Mossholder, Steel, & Bennett, 1998) with positive effects on cohesion, mutual support, and effort.

Summarizing all of the above, we hypothesize:

Hypothesis 2a: Team-internal equality of influence over project decisions is positively related to teamwork quality.

Hypothesis 2b: Team-internal equality of influence over project decisions is positively related to all six teamwork quality facets (i.e., communication, coordination, balance of member contributions, mutual support, effort, and cohesion).

Method

Sample and Data Collection

A total of 145 software development teams from four German software development laboratories participated in this research. The laboratories provided lists of projects, including names and contact information of team members, while the employees of the software laboratories were informed that a study about team management was to be conducted. As documented by Hoegl et al. (2003), the teams were tackling innovative projects with high levels of task complexity, novelty, and uncertainty as rated by both team leaders and team external managers.

All team leaders, as well as randomly chosen team members, were contacted for individual data-collection appointments. Respondents' participation in this study was strictly voluntary. All contacted respondents participated in the study. Data were gathered through individual data-collection sessions using a fully standardized questionnaire (five-point answer scale). All data-collection sessions were conducted on site in dedicated rooms, assuring similar conditions for every respondent. First, team membership as stated on the list was confirmed with the respondent to ensure that he or she was indeed a member of the team in question and to ascertain that all respondents of one team were referring to the same set of individuals as the team. Then the respondent was instructed to read and complete the questionnaire on

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his/her own. This way, possible interviewer effects were minimized, while there was still a researcher present to clarify questions if any occurred.

Multiple Informants

The database for our analyses consists of 145 team-leader and 285 team-member responses pertaining to 145 software development teams. In order to ensure content validity and to avoid a possible common source bias, data from different respondents

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were used to measure the different variables. Teamwork quality was measured using aggregated responses from multiple team members (excluding team leaders). Team-external influence over project decisions as well as team-internal equality of influence over project decisions were measured using responses from the team leaders.

Prior to the hypotheses testing analyses, we calculated interrater agreement for these variables based on both team-leader and team-member data available. Assuming a rectangular null distribution, we computed the mul-

multiple item estimator for within-group interrater agreement as proposed by James, Demaree, and Wolf (1984) and found generally strong agreement between the raters (team leader and team members) across all teams: team-external influence over project decisions: .95; team-internal equality of influence over project decisions: .86. Although we did not suspect any response bias, we also computed interrater agreement assuming a triangular distribution. We again found high agreement between the raters for team-external influence over project decisions (.81) and team-internal equality of influence over project decisions (.77). Moreover, high intraclass correlation between team-member and team-leader assessments of these variables confirms the agreement across raters (.84 and .82, respectively), while an ANOVA shows significant between-project variance

on both variables. This result offers support for using the team leaders as reliable key informants for these variables.

Measures

Team-external influence over project decisions was measured using four items referring to the degree to which operational project decisions had to be cleared with, or were influenced by, individuals or groups from outside the team (Gerwin & Moffat, 1997a, 1997b; Janz, Colquitt, & Noe, 1997; Kirkman & Rosen, 1999) (Cronbach's alpha = .79). Another three items were used to measure team-internal equality of influence over project decisions (Langfred, 2000). Those indicators refer to the degree to which all team members were involved in making project decisions (Cronbach's alpha = .83). The items for both scales are included in Appendix 1.

The teamwork quality construct was measured using between three and ten items per teamwork-quality facet, with a total of 38 items for all six facets (Hoegl & Gemuenden, 2001). The measurement scales for teamwork quality are documented in full by Hoegl and Gemuenden (2001); however, representative items and scale reliabilities are included in Appendix 2. The detailed analyses by Hoegl and Gemuenden (2001) on the basis of this data demonstrate that all six teamwork quality facets pertain to the same latent construct (i.e., are strongly loading on one factor). Their analyses further document strong interrater agreement among team members' assessments of teamwork quality in the same team (James et al., 1984). Table I features descriptive statistics and intercorrelations for all variables.

Control Variables

As this study includes data from four different software development laboratories, in our analysis we included dummy variables for laboratory to control for possible organizational effects. In addition, we included a dummy variable based on the team leaders' assessments of whether their projects involved primarily the design and development of new software solutions

TABLE I Means, Standard Deviations, and Correlations

	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Team-External Influence over Project Decisions	2.20	.85										
(2) Team-Internal Equality of Influence over Proj. Decisions	3.69	.85	-.04									
(3) Teamwork Quality	4.04	.45	-.14	.20								
(4) Communication*	4.20	.44	-.03	.17	.86							
(5) Coordination*	4.04	.59	-.09	.07	.74	.58						
(6) Balance of Member Contributions*	4.08	.50	-.20	.18	.87	.73	.54					
(7) Mutual Support*	4.13	.55	-.06	.16	.88	.80	.55	.75				
(8) Effort*	3.91	.59	-.16	.17	.83	.61	.52	.65	.62			
(9) Cohesion*	3.89	.56	-.17	.24	.88	.69	.49	.74	.75	.78		
(10) Team Size	6.34	2.88	.20	-.17	-.19	-.19	-.05	-.24	-.14	-.17	-.18	
(11) Project Type (new vs.upgrade)	–	–	-.06	.04	.02	-.05	.04	-.01	.00	.06	.04	-.05

N=145 teams

* Teamwork quality facet

Correlation coefficients of .14 or greater are significant at the .05 level; those of .20 or greater are significant at the .01 level.

(more innovative) or primarily the upgrade or customization of existing software solutions (less innovative). Even though both types of projects can generally be considered innovative (relative to more routine tasks such as manufacturing), we suspected that software customization and upgrade projects might be conducted under tighter team-external control, as these projects are relatively more programmable than the new software projects. Finally, we also included team size as a control variable in our analysis. The size of a project team is an important structural variable, with potential influences on the quality of a team's collaborative task process and project success (Hackman, 1987).

Results

Table II reports the results of the regression analyses. Hypothesis 1a proposes a negative relationship between team-external influ-

ence over project decisions and teamwork quality. Our regression results show a negative relationship and thus support Hypothesis 1a. Hypothesis 1b, proposing a relationship with all six teamwork quality facets, however, is only partially supported, as team-external influence over project decisions fails to show a significant negative relationship with three out of six facets (i.e., no significant relationship was found for communication, coordination, and mutual support).

This study provides support for Hypothesis 2a, in which we advanced a positive relationship between team-internal equality of influence over project decisions and teamwork quality. Furthermore, our analyses also largely support Hypothesis 2b, as team-internal equality of influence over project decisions shows significant positive relationships with five of the six teamwork quality facets. Only coordination fails to show a significant relationship.

TABLE II Regression Analysis

Independent Variables	Dependent Variables (Std. Coef.)						
	Teamwork Quality	Communication	Coordination	Balance of Member Contributions	Mutual Support	Effort	Cohesion
Laboratory 1	.19*	.18 [†]	.08	.25*	.08	.16 [†]	.25*
Laboratory 2	.21*	.15 [†]	.11	.26**	.10	.25*	.19*
Laboratory 3	.22*	.28*	.17	.23*	.09	.18 [†]	.16
Project Type (new vs. upgrade)	.04	-.03	.05	.02	.00	.07	.06
Team Size	-.15*	-.18*	-.02	-.21**	-.12 [†]	-.14 [†]	-.15*
Team-External Influence over Project Decisions	-.15*	-.05	-.11	-.20**	-.05	-.16*	-.17*
Team-Internal Equality of Influence over Project Decisions	.15*	.12[†]	.05	.12[†]	.13[†]	.13[†]	.19*
R-square	.10	.09	.03	.14	.05	.10	.13
F	2.21*	2.04*	.55	3.26**	.93	2.23*	2.89**

[†]significant at the .10 level

*significant at the .05 level

**significant at the .01 level

Discussion

This research indicates that in the context of innovative projects, low levels of team-external influence over operational decisions as well as high levels of team-internal equality of influence over project decisions are beneficial in facilitating the collaborative processes for which cross-functional innovation teams are created in the first place.

As highlighted in the conceptual part of this article, our study pertains to a specific type of team-external influence (i.e., that on operational decisions regarding work strategies and processes) and team-internal equality of influence (i.e., in terms of shared authority on important decisions). Hence, this study's results should be viewed in this light, acknowledging that there are other types of external influence (e.g., constructive task feedback) that can be potentially beneficial. In addition, the concept of shared authority

does not necessarily mean equal amounts of input in terms of ideas and discussion time.

Theoretical Implication

Team-external influence may be valuable to the teams by, for instance, providing information regarding available resources or connecting teams to organizational goals (Gerwin & Moffat, 1997a, 1997b). In other cases, team-external influence has been found to be beneficial because of rapid market changes (Miller, 1975) or management's desire to intervene because of serious problems (Hackman, 1990). However, for the specific form of team-external influence investigated here, our results mirror past research in more routine projects, as we found a negative relationship with teamwork quality (Gerwin & Moffat, 1997a, 1997b; Kirkman & Rosen, 1999; Wall et al., 1986).

Additionally, although equality of influence may not be desirable in all situations,

the results from this research on innovative projects provide support for the hypothesized positive relationship between team-internal equality of influence over project decisions and teamwork quality. These results extend the literature on team autonomy, as previous studies have largely ignored the team-internal distribution of decision authority of “empowered” teams (Langfred, 2000).

Managerial Implications

From a practical standpoint, the results from this study offer advice to human resources managers and research and development (R&D) managers alike. First, the results provide a clear indication that team-external managers of innovation projects should carefully consider any interference with operational project decisions, as this is likely to be negatively related to important collaborative processes in the teams. This requirement is particularly central given that innovation teams are formed in the first place to increase direct interaction between members from different functional areas involved in the projects (Hoegl & Gemuenden, 2001).

From an HR perspective, these results indicate the importance of administrative and conceptual skills of team members. Furthermore, it highlights the necessity to support R&D managers in the implementation of team empowerment (rather than team-leader empowerment). Hence, managers of innovation projects must be made aware that they should provide teams with information rather than instructions and lead, for example, by goals and feedback rather than micromanaging.

Second, our results indicate that even though formal team leaders may be appointed, the collaborative team processes benefit from team-internal equality of influence over project decisions. As such, it is important that team leaders institute a decision-making model of shared authority and influence from the start of the project. Thus, team leaders of innovation projects are generally well advised to take the roles of facilitators or coordinators (Manz & Sims, 1987) rather than perceiving themselves as the cen-

tral decision makers where all information lines converge. Finally, team members (including the formal team leader) need to accept that the decision processes will be collaborative and that the resulting joint decisions may regularly represent compromises between more extreme positions held in the team (e.g., different alternatives favored by the representatives from different functions). It is important that HR practices such as employee selection and development also focus on creating a personnel pool where individuals are both able and willing to engage in participative decision processes with members from different organizational units or with different functional backgrounds.

Limitations and Outlook

A few limitations of this study should be noted, along with questions for future research. First, the data for this research are cross-sectional rather than longitudinal. As this study demonstrates associations between variables, it cannot fully establish causality. A longitudinal research design using multiple informants would further our knowledge toward both causality of relationships and the development of team autonomy and team collaboration perceptions over time. Second, the scope of the empirical data gathered for this research allows generalization of the results obtained chiefly to the domain of teams with innovative tasks such as R&D teams or new venture teams. Third, the present study was conducted in software development laboratories in Germany, raising the question of transferability of results to other cultures such as those of North America or Asia. Further research in other countries is encouraged in order to increase our understanding of the possible influences of country context

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on the relationships investigated here. Fourth, although team-external influence in operational decisions was found to generally hinder teamwork quality, as mentioned in the article, some forms of external intervention (e.g., offering constructive task feedback) are likely to be necessary and useful. We encourage future research to extend our framework and include other types of influence. In that regard, it would also be beneficial to investigate how such different types of influence affect team members' overall perceived autonomy. Fifth, although our hy-

pothesized relations held with the wider concept of teamwork quality, some of these relations lacked support with specific components of teamwork quality. Future research should investigate these specific relationships (e.g., team autonomy and coordination). Finally, this research was not intended to provide a comprehensive test of possible antecedents of teamwork quality. It remains important, however, to further our understanding of what drives teamwork quality in innovative projects, given its solid relationship with project success.

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APPENDIX 1: MEASUREMENT SCALES OF THE INDEPENDENT VARIABLES

Variables	Items
Team-External Influence over Project Decisions	Important operational decisions in the project (e.g., work organization, setting of subgoals, important technical matters) had to be cleared with management. Other people and groups within the (greater) organization had notable influence over important operational decisions in the project. The management exercised great influence over the design of work assignments within the project. The management exercised great influence over the setting of subgoals in the project. Four items, Cronbach's alpha = .79.
Team-Internal Equality of Influence over Project Decisions	The team made important decisions (e.g., setting subgoals in the project, structuring the work) mostly in a democratic fashion. Some team members made important decisions without consulting the other team members. ^R Our team made important decisions jointly. Three items, Cronbach's alpha = .83.

^R = reverse coded item.

Note: These are translations from the original German items used in the study.

APPENDIX 2: REPRESENTATIVE ITEMS OF THE DEPENDENT VARIABLE

Variables	Representative Items
Teamwork Quality	<p><i>Communication:</i> The team members communicated mostly directly and personally with each other. Project-relevant information was shared openly by all team members. The team members were happy with the usefulness of the information received from other team members. Ten items, Cronbach's alpha = .94.</p> <p><i>Coordination:</i> The work done on subtasks within the project was closely harmonized. There were clear and fully comprehended goals for subtasks within our team. Four items, Cronbach's alpha = .85.</p> <p><i>Balance of Member Contributions:</i> The team recognized the specific potentials (strengths and weaknesses) of individual team members. The team members were contributing to the achievement of the team's goals in accordance to their specific potentials. Three items, Cronbach's alpha = .72.</p> <p><i>Mutual Support:</i> The team members helped and supported each other as best they could. Discussions and controversies were conducted constructively. Suggestions and contributions of team members were discussed and further developed. Seven items, Cronbach's alpha = .93.</p> <p><i>Effort:</i> Every team member fully pushed the project. Every team member made the project highest priority. Four items, Cronbach's alpha = .94.</p> <p><i>Cohesion:</i> It was important to the members of our team to be part of this project. All members were fully integrated in our team. Our team was sticking together. Ten items, Cronbach's alpha = .97.</p>

Note: These are translations of the original German items used in the study.