

Organizational Conditions Fostering Prosocial Work Orientations in Teams

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Abstract

A hypothetical framework for "collective action regulation" is presented that includes an integration of concepts and a typology, which contains criteria for a clear distinction between "autonomous" and "restrictive" forms of group work. Furthermore, processes of collective action regulation can crystallize in "common objectifications". These are understood as the material results, when members of a work group mutually create or improve their own tools, knowledge stores, etc. This framework resulted in a method integration that consists of condition-related observation-interviews. Self-report scales were developed for the measurement of common task orientation and further cooperation-relevant attitudes. In a cross-sectional study, 17 work groups including 122 group members were analyzed in two companies. A strong correlation exists between types of collective self-regulation and the number of common objectifications. There are also correlations between the latter and most components of common task orientation. Variance analyses show that a high degree of collective self-regulation is positively related to certain, but not all, components of common task orientation. It is discussed, whether common objectifications can be seen as "objective", materialized expressions of prosocial work attitudes.

Keywords

Work Groups, Autonomy, Cooperation, Cohesiveness, Activity Theory

Different views on cohesiveness, prosocial work orientations, and their work-related antecedents

If group work systems are to be evaluated responsibly and even improved upon for the workers involved, an adequate psychological model of the requirements for collective action (from manager-led operation to self-regulation) and of the conditions that foster or hinder collaboration, cooperative attitudes and mutual help is an essential prerequisite. Overviews by Goodman et al. (1987), as well as by Mudrack (1989), suggest that the findings of many studies on relations between group tasks, group cohesiveness, and outcome variables (e.g. work motivation, performance, effectiveness) are unclear or contradictory due to their theoretical-conceptual and operationalization problems. Moreover, Mullen and Copper (1994) showed in a meta-analysis that neither "interpersonal attraction", nor "group pride", but "... commitment to the task seems to be the most important component of cohesiveness in the cohesiveness-performance effect" (p. 224). For this reason, work- and task-related conceptualizations of group cohesiveness are desirable.

There are some theoretical approaches that emphasize the role that specific organizational conditions, namely self-regulation, collective autonomy of decision-making, positive goal interdependence, and task interdependence, play for the development of common task orientation just up to prosocial orientations (e.g. Deutsch, 1973; Emery and Thorsrud, 1976; Petrovsky, 1985). This relationship is the central subject of the present paper. However, possible relations between the kind of structures of group tasks in the organizational context and the development of cooperative versus competitive attitudes have long been neglected in social psychological small group research. For example, group cohesiveness and the readiness to help are traced back to mutual sympathy, to personal attraction, to mood management, to self-concept enhancement, or to external norms.

A work-related concept of group cohesiveness might benefit from recent concepts like organizational citizenship behavior (OCB, Organ, 1988), which has provided psychology with a construct, that allows to differentiate "prosocial" and "selfish" work orientations. However, a closer look at theoretical reflections and several scales for the measurement of OCB and related constructs (Moorman and Blakely, 1995; Konovsky and Organ, 1996) reveals that organizational citizenship behavior is not so much aimed at the furtherance of social skills like Altruism and Courtesy, but at the effectiveness of the enterprise. From the point of view of effectiveness, workers' citizenship behavior serves as a means of labor intensification and personnel selection. OCB only includes (self-reported) behaviors, which are functional to the economic success of the employers. In the time of "downsizing", "outsourcing", or "shareholder value", it seems questionable, whether prosocial behavior in the sense of OCB really has beneficial effects for the majority of employees that form "the" organization. Furthermore, although Konovsky and Organ (1996, p. 262) recognize "that the Big Five rendering of traits, while useful at a globally descriptive level of personality, is not the most promising approach to predicting workplace contributions" to OCB, much research has been done to demonstrate causal influences of personality traits, such as Individualism-Collectivism, on prosocial behavior in organizations (cf. Moorman and Blakely, 1995).

In summary (cf. Weber, 1997), the following problems seem to exist in the research on possible organizational prerequisites of cooperative — up to prosocial — orientations:

- Collective self-regulation and collective autonomy are characteristically tapped with short self-report scales or with rating scales (overview: Ulich and Weber, 1996). An empirical comparison of different method reliabilities demonstrates that the correspondance between these methods is often not very satisfactory (Campion et al, 1993). This is possibly due to the fact that most autonomy scales and category schemes only allow a relatively rough analysis. The additional application of more fine-grained analysis instruments is desirable.
- Because of the attitude-behavior-gap, it would be favourable to also have other indicators of work-related group cohesiveness, rather than self-report scales. One attempt, is to analyze the material results of joint activity.
- Often, when psychological aspects, such as prosocial orientations in work groups are analyzed, this serves as a means for the assessment of criteria of economic viability, like productivity, effectiveness, and performance. In a more humanistic perspective, the promotion of cooperative attitudes is a legitimate goal – and not primarily a means – in promoting personal development through humane work design. Yet, there seems to be a lack of instruments, especially of methods with more than three to five items per construct, that focus on such humane aspects of prosocial work orientations.

A Framework of collective action regulation: constructs and methods

Concepts, methods, and a typology will be presented in this chapter, that are based on a theoretical-methodological integration proposal (Weber, 1997), which includes compatible action psychological constructs of the socio-technical systems approach, action regulation theory, and activity theory. Within this framework, it is hypothesized that the extent of possibilities for collective self-regulation (as supposed antecedent conditions) will positively influence cooperation-relevant attitudes of the members of a group and the common creation or improvement of shared tools, methods, and knowledge reservoirs (common objectifications).

Areas of collective self-regulation and levels of collective regulation requirements as core features of group work

The socio-technical systems approach considers the enterprise as an open system, which maintains its position by a high degree of self-regulation in the turbulent environment of market-economics. Cooperating (semi-) autonomous work groups in different units are an important means of organizational self-regulation (Emery and Thorsrud, 1976). In the United States, Susman (1976) developed his theoretical integration of self-regulation in

autonomous work groups simultaneously (but not in contact) with the development of action regulation theory in German-speaking countries (Volpert, 1989; Hacker, 1994). According to Susman, as well as to Alioth and Ulich (1981), in collective self-regulation, work groups plan together and make decisions, regarding the tasks assigned to them and the conditions under which tasks will be executed, or they decide on the decision principles themselves. Collective self-regulation refers to those decisions, which stand in indirect connection to the production process, such as decisions on production planning and control within the work system ("coordination"), on work distribution and "allocation" of resources, and on regulating input and output ("boundary transaction"). Collective self-regulation relates to communicated cognitive acts, by which intended material transformations in the manufacturing process are prepared or corrected.

According to the socio-technical approach as well as to further authors, the following features of semi-autonomous group work enable social competencies and prosocial orientations to be fostered or developed (cf. Deutsch, 1973; Alioth and Ulich, 1981; Petrovsky, 1985; Campion et al. 1993; Tjosvold, 1998): Positive interdependence of the (production) goal, interdependence of the included work tasks (that constitute the production throughput), and common requirements for planning and decision-making (with regard to the organization of the production process).

More sophisticatedly than the socio-technical approach, action regulation theorists have developed various constructs for a differentiated analysis of the requirements upon thinking, planning, and decision-making involved in work tasks. The construct of regulation requirements (Oesterreich and Volpert, 1986) describes demands upon planning and decision-making within separate, individually-executed work tasks. According to the theoretical-methodological integration proposal of Weber (1997), the shared regulation requirements regarding coordination, allocation, and boundary transaction (sensu Susman, 1976) may be represented as the collective action structure of the work group. In semi-autonomous work groups a central task exists that is shared by all group members involved, and within which planning takes place collectively (Kötter and Gohde, 1991). In accordance with the task requirements they share, equal-status group members gradually produce, in dialogue with one another, a common, (hierarchical-sequentially) organized structure of action: Individual contributions regarding planning, suggestions, evaluations, and so forth are mutually commented upon, modified, expanded, and are then gradually integrated (cf. case studies reported by Cranach et al. 1986). As a result, realistic situation evaluations, production process plans, decisions on finite production planning, error diagnosis, and solutions for technical problems can emerge. It is assumed that these potential functions of collective self-regulation provide a scope – like a biotope – for the (further-) development of prosocial work orientations in a work group, only if the functions contain enough complex requirements for collective decision-making.

Self-regulation functions, which are closely related in content and have the same, specific goal, form a central task area. The shared regulation requirements of seven central task areas can be analyzed with regard to their collective decision-making demands. The following abbreviated categorization is based upon industrial management and work psychological studies, as well as upon an own investigation of 20 work groups (in detail: VERA-CAR instrument, see Weber, 1997):

- (1) Production planning and control (boundary transaction).
- (2) Group-internal shop floor control (job scheduling, organization of resources).
- (3) Allocation of personnel and distribution of tasks (e.g., task rotation).
- (4) Joint execution of manufacturing tasks (e.g., repairing of machinery and equipment).
- (5) Improvement activities for technical and organizational problems.
- (6) Planning of personnel development and training.
- (7) Group decisions regarding self-government (e.g. setting decision criteria and rules, election of a group spokesperson, recruiting of group members).

Because no condition-related method of analyzing collective regulation requirements in work groups was found, the semi-standardized VERA procedure for evaluating individual work tasks was adapted. VERA ("Verfahren zur Ermittlung von Regulationserfordernissen in der Arbeit"; see in more detail: Oesterreich and Volpert, 1986) means Instrument to Identify Regulation Requirements at Work. Various socio-technical categorization schemes (Ulich and Weber, 1996) were then integrated. This and other modifications resulted in the VERA-CAR instrument (translated: "VERA for the Analysis of Collective Action Regulation in Industrial Work Groups"; version in German language: see Weber, 1997). The VERA-CAR instrument is a manual-guided observational interview. The level of collective regulation requirements is evaluated by trained investigators through observation and interviews of sufficiently trained workers during the actual performing of functions of self-regulation (one to four days).

Planning and decision-making demands as well as related communication demands are considered as joint, collective regulation requirements and tapped at group level. The extent of collective regulation requirements of each central task area is evaluated by an adaptation of the 10-step model of regulation requirements (the statistical standards of this instrument are presented in Leitner et al. 1993). Work tasks can be assigned to five levels of planning and decision-making demands. The level potentially most favourable for the (further) development of social and cognitive skills is Level 5. The lowest Level 1 characterizes work tasks offering no real decision-making demands or social opportunities (e.g., many tasks at assembly lines). For each level, an additional restrictive step (abbreviated as "R") is defined that occurs, when decision-making processes of the relevant level are only partially required. The regulation levels are differentiated as follows (in detail: see Leitner et al. 1993):

- Level 5: Design and set-up of new work processes
- Level 4: Coordination of part-processes
- Level 3: Complex strategic decisions
- Level 2: Single decisions
- Level 1: Application of algorithmic rules

A typology of collective action regulation in industrial work groups

In the following, a preliminary typology of collective action regulation in work groups in different areas of manufacturing, assembly, and technical support will be introduced (Weber, 1997). A prototype of this typology was derived from concepts of action regu-

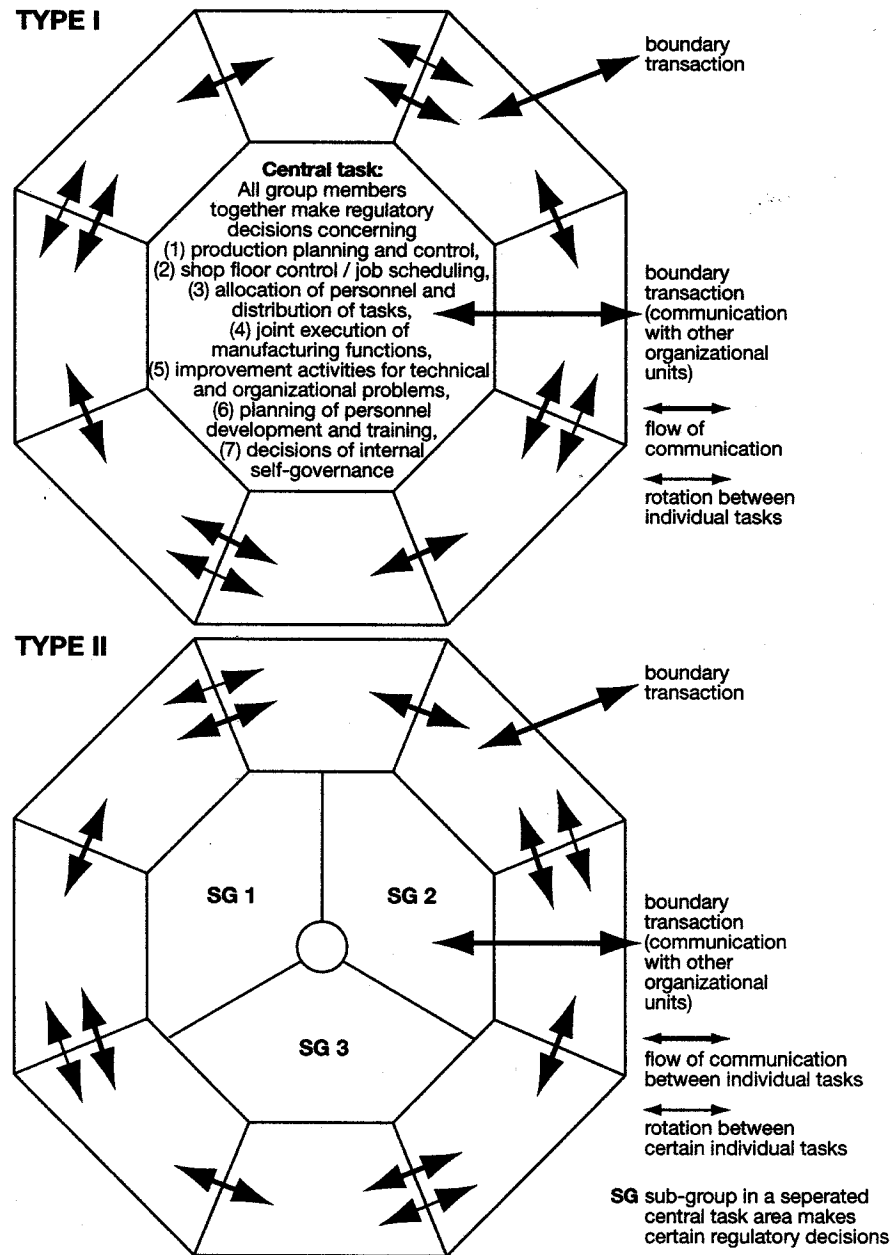


Figure 1. Group work with homogeneous and complete central task (Type I). Group work with distributed central task areas (Type II).

lation theory and of the socio-technical systems approach, as well as from former case-studies. This prototype was modified, based on the results of an investigation of 20 work groups (with about 155 team members) out of four enterprises. Statistical representativeness is not claimed. The types of collective action regulation are arranged from bottom to top with increasing possibilities of collective self-regulation.

Type I: Group work with a homogeneous and complete central task

This type, which was concipated by Kötter and Gohde (1991), corresponds to a type of autonomous group work with a homogeneous and complete central task (symbolized by the circle area in Figure 1, Type I). Characteristically, each member of the group participates in regulatory functions of all central task areas. Medium-size to high regulation requirements result from the fact that all group members decide on the coordination and allocation of resources, boundary transaction, as well as on planning of internal personnel development and self-government of the group. These regulation requirements are represented by common strategic decisions (VERA-CAR step 3), or perhaps, by a common coordination of part-processes (step 4). The group members decide on their rotation (interrupted, bi-directional arrows in Figure 1) between individually executed tasks (eight trapezoids). Type I did not occur in our sample, but some examples were realized in Swiss and German enterprises (Weber, 1997).

Type II: Group work with distributed central task areas

It is characteristic of Type II (see Figure 1) that several group members form a permanent sub-group. In one (or more) sub-groups, each member of the group participates in regulatory functions of certain, but not all central task areas.

Typically, regulatory functions of the central task areas 2, 3, and 7 are delegated to the work group. Therefore, a group of this type is entitled to decide (semi-) autonomously on job scheduling (coordination), on the allocation of personnel and distribution of tasks, as well as on its representatives and on its negotiations with the internal environment of the organization. The area of the large circle in Figure 1 Type II symbolizes the central task of the whole group. In contrast to Type I, the circle is divided into several fields that characterize different central task areas. Each area is collectively regulated by a different sub-group (whose members may, but need not, overlap with another sub-group). This form of distributed collective self-regulation is connected with common strategic decisions in at least one central task area, according to the collective regulation requirements of VERA-CAR step 3 (as in one group of our sample) or of step 3R (as in two groups). Four groups of our sample belong to Type II. On group meetings, the sub-groups occasionally resolve questions that are of relevance for the complete group. Bi-directional arrows characterize single acts of communication that are necessary for the execution of individual tasks (eight trapezoids). For example, two members of a group discuss with each other, whether a certain operation should be better done on one machine or on the other. Interrupted arrows symbolize the flexible rotation of various group members between several individually executed tasks.

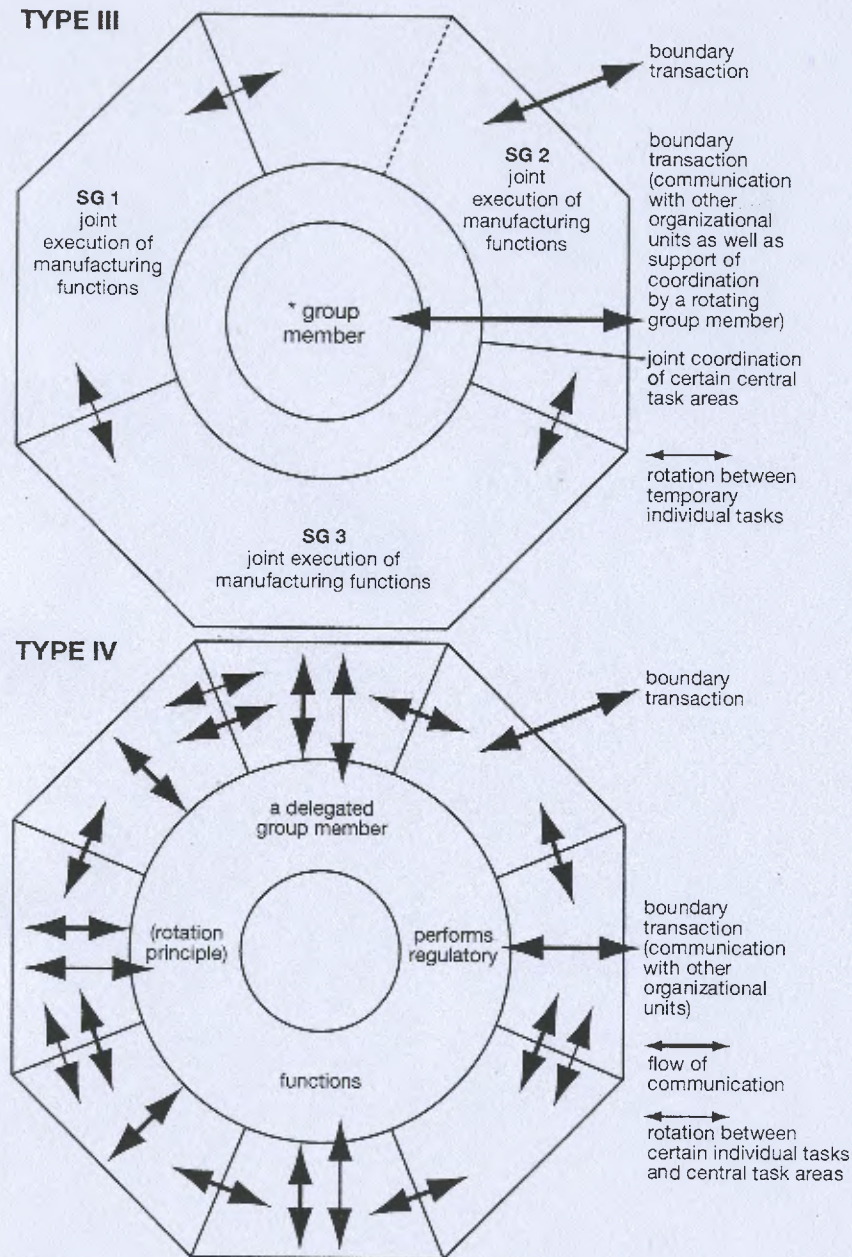


Figure 2. Group work with simultaneous cooperation (Type III). Group work with rotating central task areas (Type IV).

Type III: Group work with simultaneous cooperation

Compared with Type I, II, and IV, it is characteristic for work groups of Type III, that they jointly execute many manufacturing tasks. That is, they act together – shoulder-to-shoulder and face-to-face – during the planning as well as during the execution of manufacturing processes (Figure 2, on the left). Each cooperation partner follows his partner's actions attentively and supports him or her, in case his partner should need some help. All collaborating group members simultaneously receive feedback on any transformations of material, machinery, and tools. If organizational problems, technical defects, or errors appear, then the partners discuss and agree on strategies for solving these problems. If circumstances require, the separation between the central task (or central task areas) and individual tasks is cancelled and collective action takes place: Several individual tasks merge into one area. Additionally, temporary individual jobs may also be assigned to single group members (interrupted line).

Occasionally, the cooperation partners employ their experience and knowledge, which they acquire during these joint actions, in activities directed towards an improvement of machinery, tools, and work organization (central task area 5). The combined regulatory functions of the task areas 4 and 5 require at least common strategic decisions (VERA-CAR step 3R to 3). Two work groups of our sample, a maintenance team (VERA-CAR step 4) and a flexible manufacturing system team (VERA-CAR-group step 3), belong to this type applying semi-autonomous group work. In contrast to Type II, functions of production planning and control (central task area 1), connecting the group with other organizational units, as well as functions of group-internal shop-floor control (central task area 2) are alternately delegated to single group members (inner circle of Figure 3). At group meetings (symbolized by a ring around the inner circle), the whole group decides on matters concerning training activities (central task area 6) and its internal self-government (central task area 7).

Type IV: Group work with rotating central task areas

Figure 2 on the right shows Type IV that is characterized by central task areas, which are divided among individual group members, according to a self-regulated job rotation system. This is illustrated by the area in the shape of a ring. The inside of the ring is blank, because no direct collective action regulation takes place. Each member of the group participates in regulatory functions of some, but not of all central task areas. For example, some group members alternate in the execution of group-internal shop-floor control (central task area 2). Others alternate in the allocation of personnel and tasks (central task area 3). If circumstances require, the incumbents of "individualized" central task areas communicate with supervisors and with representatives of other organizational units (e.g. production controllers). From an organizational psychology point of view, the central characteristics of Type IV consists in the following: Alternately, (almost) each member of the group performs regulatory functions (a) of one central task area (or more) requiring strategic decisions (VERA step 3R to 3), or (b) of two (or more) central task areas that require single decisions (VERA step 2). This group-type represents the borderline of collective action regulation. Similar to Type I, II, and III,

the core features of semi-autonomous group work are manifest, because “collective” functions of coordination, allocation, and boundary transaction are individually performed by (nearly) all rotating group members – and not by a permanent group leader. Occasionally, incumbents of regulatory functions discuss and agree on organizational or technical problems with other group members. Therefore, it is justified to consider these processes of action regulation as “collective”. No group of this type appeared in our sample. Its occurrence in some Swedish and German enterprises is nevertheless documented (cf. Weber, 1997).

Type V: Group work with rudimentary central task areas

In this type of group work (Figure 3, on the left), most of the potentially collective regulatory functions are assigned to a permanent group leader. In effect, this means that he or she plays the role of a permanent foreman. Within the bounds of guidelines originating from a production planning department, the group leader is typically occupied with the more challenging regulatory functions of central task area 1 (boundary transaction: participation in production planning and control), of central task area 2 (coordination: internal shop-floor control), and of central task area 7 (decisions on self-government). In Figure 3 (on the left), his or her meaningful individual task is symbolized by a large octagonal area.

The small area of the inner circle shows that only a few regulatory functions from one or two central task areas are delegated to the group as a whole. The group members decide on the allocation of personnel and on the distribution of tasks (central task area 3), or they participate in improvement activities regarding technical and organizational

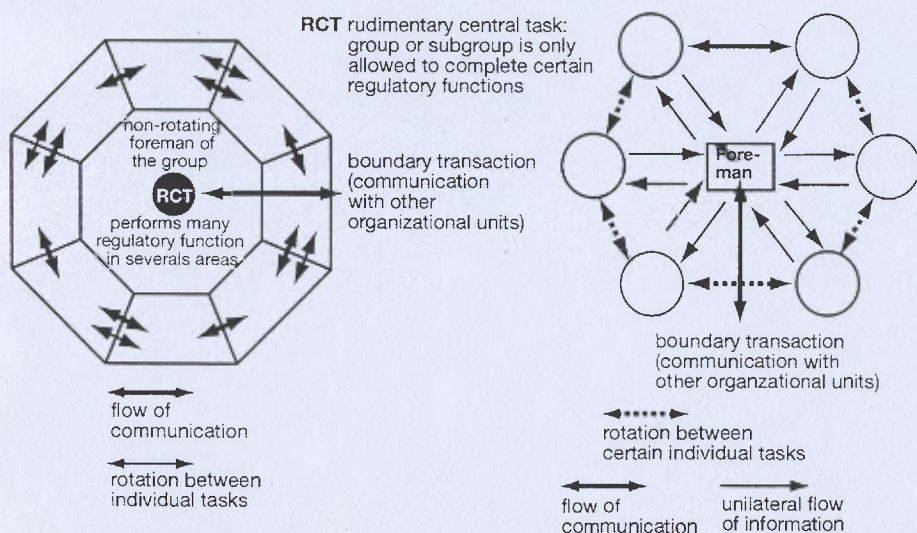


Figure 3. Group work with rudimentary central task areas (Type V, on the left). Hierarchically-led cooperative structure (Type VI, on the right).

problems that occur inside or within the environment of their work system (central task area 5). Yet, these collective improvement activities do not provide very challenging regulation requirements. As a main characteristic of Type V, only one central task area occasionally requires common single decisions (VERA-CAR step 2). Because many meaningful regulatory functions are centralized in the person of the group leader, one core feature of semi-autonomous group work, namely collective coordination, does not exist. Compared with the Types I to IV, Type V offers only a few chances for the group members to preserve or to improve their social and cognitive skills. Thus, this group-type can be labeled as “restrictive group work with rudimentary central task areas”. Case studies on “lean production” in production plants of Toyota, as well as the present study, indicate that many teams in automobile manufacturing belong to this type. The present sample is dominated by groups of Type V (in eight out of 20 cases; VERA-CAR-group step: 2)

Typ VI: Hierarchically-led cooperative structure

According to the criteria of action regulation theory and the socio-technical approach, a hierarchically-led cooperative structure (Type VI; see Figure 3, on the right) lies beyond the frontier between group work and (tayloristic) individual work. Characteristically, a “regulatory core” (Kötter and Gohde, 1991), meaning a collective central task that coordinates and interlinks the individually executed tasks, does not exist. An internal “group leader”, a foreman who is supported by members of planning departments “possesses” all central task areas. According to a job rotation scheme, the group members alternate between work places with different tasks (interrupted arrows in Figure 3, on the right). The group members do not participate in planning and decision-making at all. The internal informations flow uni-directionally and the flow itself is star-shaped. Communication is restricted to instructions, hints, or questions from the group leader, as well as to answers from his co-workers. Communicative acts of the group members are limited to the common application of algorithmic rules (VERA-CAR step 1R to 1) or to the common mental processing of activities in advance (VERA-CAR step 2R). Step 2R occurs, if the group allocates personnel and tasks (central task area 3) under changing conditions. There are nearly no possibilities at all for self-regulation and for the preservation or improvement of social and cognitive skills. Six groups of the present sample belong to this highly restrictive type of “group work” (VERA-CAR-group steps: from 1R to 2R).

Common objectifications as materializations of collective action regulation

In the present section, it will be argued that a high level of collective self-regulation (Group Type I to IV) not only fosters prosocial work attitudes, but at the same time, the common creation of a group’s own tools and knowledge stores, too. If this is true, then such “common objectifications” may serve as a material indicator – among further possible indicators – for prosocial organizational attitudes and behavior.

Conceptualizations and empirical studies of scholars of the activity theory, which was developed mainly in Russia and Eastern Europe, let assume that complex structures of joint tasks find their expression in material objects. In a comprehensive description of the foundations of activity theory, Leont'ev (1978) states that human work activity develops into its product, like a good or a tool. He considers products as "material embodiments" of the object-related content of work activities as well as of individual experiences and skills, which are to a high degree mediated by products of others (e.g. tools, textbooks, knowledge stores): "The tool mediates an activity, which connects man not only with the world of objects, but also with other human beings. By this, his activity appropriates the experience of humanity" (Leont'ev, 1978; translated from the German version, 1982, p. 97). Like many contemporary cultural anthropologists, Leont'ev regards the development of individuals, of mental processes, and of interpersonal relations as embedded in the development of their natural world and society. Developmental processes of human beings, nature, and societal culture are seen as a co-evolution; they are interlinked closely, as Leont'ev's constructs of objectification and appropriation demonstrate: If a craftsman plans and manufactures a novel tool, then this tool is an objectification of his knowledge about the necessary manufacturing process as well as about the possible application and utilization of this tool. A second craftsman, who learns to use this tool, appropriates a part of the experience and skills of the first craftsman, even if he or she doesn't know him personally. If they know each other, then the exchange of work means and joint activities can further the development of their interpersonal relations. This is an example for the assumption of activity theory, that the human society is constituted and reproduced by human actions and their symbolic (e.g. language) and material objectifications, which in turn offer pre-conditions and possibilities for the development of human activities (Engeström, 1987).

Galperin (1966), a former co-worker of Leont'ev, attached importance to material representations of mental processes. According to his theoretical as well as to his empirical studies, a complex action is acquired efficiently, if (a) an instructor conveys a precise picture of this action to his/her apprentice, and (b) if he/she asks the apprentice not only to perform this action, but also to reconstruct the action process by symbolized means. "Materializations", with increasing abstraction, are considered as mediating links between an external, observable gestalt of an action and its internal, mental representation. Galperin calls this process "stagewise formation of intellectual actions", for example, a course from material models, sketches, symbols, and spoken words to mental images and concepts. Raeithel (1994) and Volpert (1999), whose work refers to Leont'ev and Vygotski, as well as to Hacker et al. (1998), who themselves refer to Galperin, make clear that this materialization is not only of considerable meaning to the acquisition of individual knowledge. Materializations also serve as tools for thinking.

In joining these complementary approaches together, I proposed an integrative construct of common objectifications (Weber, 1997): The process of common objectification is understood as a process, by which all (or several) members of a work group mutually transfer their individual knowledge, expertise, and experience into a material form. By doing this, they make their materialized knowledge and expertise available to other group members. The outcome of this process are common objectifications: A group's own internally produced, further-developed, or improved material means of

work (tools, models, etc.), virtual means of work (e.g. software tools or macros), visualizations of means of work (e.g. photographs or films), planning and working methods (heuristics for production planning and control, checklists for the diagnosis of machine troubles, etc.), evaluation methods (e.g. for lead times, fault rate), knowledge stores (data bases, card files etc.), means of information and communication (CSCW-components), minutes and records (of group meetings, improvement suggestions, etc.), as well as reference books (e.g. manuals for trouble-shooting).

Often, group members or sub-groups will add their own individual contributions to these reservoirs of know-how and working methods. Thus, the group's own, shared products are developed and can be utilized by all members of the group: Each member can, to a certain extent, acquire and use the shared knowledge. At the same time, the individual expands the group's shared knowledge, by putting his or her own know-how at their "disposal" in the form of externalized contributions. VERA-CAR includes a theoretically-derived, qualitative classification scheme, which is based on categorical considerations outlined in this section as well as suggested by Oberquelle (1991) and Volpert (1999). The (yet non-standardized) scheme allows common objectifications to be identified in observation interviews according to nine categories. An object is only evaluated as a common objectification in group territory, if it has at least been modified by a sub-group (with a minimum of three members) of the work group.

Common task orientation and related attitudes as components of prosocial work orientations

As described in the first chapter, commitment to group tasks and prosocial work orientations seem to be promising dimensions of group cohesiveness, as far as cohesiveness is considered in the context of work tasks. These characterizations of cooperative attitudes go well with a specific framework construct, namely common task orientation, that was proposed by representatives of the socio-technical systems approach (e.g. Emery and Thorsrud, 1976; Alioth and Ulich, 1981). According to them, common task orientation is a pattern of attitudes that refers to the readiness of group members to share responsibility for their work-related activities and work results, as well as to support each other, if assistance or help is needed. Collective decision-autonomy and possibilities for self-regulation are seen as antecedent conditions that support the (further-/) development of a common task orientation. A standardized Questionnaire for Group Work was developed (in detail: see Weber, 1997) to investigate, whether this hypothesized connection is verifiable in a sample of work groups within advanced manufacturing systems. A common task orientation is characterized by a pattern of cooperation-relevant attitudes and perceptions, which are shared by the members of a group. These are made up of the following components:

(1) Acceptance of a common task and common responsibility: This component describes the extent, to which a work group shows readiness to take on mutual responsibility for the tasks and the results of those tasks assigned to them within the work system. This includes a willingness of the individual group member to shoulder responsibility, even for the work of others in the group, and to take on unpleasant tasks or

correct others' mistakes. The Questionnaire for Group Work includes two negative indicator scales to tap this first component of a common task orientation: "Lack of collective responsibility" and "individual denial of responsibility".

(2) Mutual support and furtherance of others as well as (3) taking over the perspective of others are components which each refer to the readiness of group members to support each other mutually, share their knowledge and skills, and spare each other mistakes and frustrations. In addition, these components also refer to the willingness to limit short-term needs to the benefit of long-term goals and to the ability to put oneself in a partner's current situation and mood (scale: "mutual support")

(4) Making useful contributions to a mutual product: This feature indicates a need of each group member to feel that his or her own contribution is useful, with regard to the jointly produced product, and to receive recognition for that contribution from other members. If such a product, made up of interdependent part-tasks, exists, then there is an opportunity to collectively experience efficacy. There are two indicators for this component: The scale "perceived efficacy" and the scale "social recognition of contributions to the group".

Additionally, a bipolar construct of Deutsch (1973; cf. Tjosvold, 1998) can be related to common task orientation: A cooperative orientation comprises the readiness of interaction partners to combine their ideas and share their resources without expecting an immediate service in return. Procedures and returns are distributed in an egalitarian fashion, and one's own behavior takes the interests of the others into account. A competitive orientation refers to a selfish tendency of ruthlessly following one's own interests, emphasizing authority and status, and mistrusting one's partners in interactions. Competitive orientation is tapped by two negative indicators for a common task orientation: "Hierarchical thinking" and "idiocentrism".

Hypothetical framework: relations between group-types, common objectifications and common task orientation

In the following, a part of a hypothetical framework will be presented. It results from the introduced constructs of the socio-technical approach, of action regulation theory, and of activity theory. The framework is derived from the proposal for conceptual integration, which is discussed more comprehensively in Weber (1997). As a consequence of the preference for a conceptual clarification and for greater analysis depth, the framework is tentative and selective. The test of three derived hypotheses has an exploratory character (cross-sectional design).

Hypothesis 1 states that types of work groups with considerable or many possibilities for collective self-regulation (from Type IV to Type I) are positively related to the common creation or improvement of objectifications. The more possibilities that exist for self-regulation in a work group, the higher will be the number of common objectifications that appear.

A core feature of work groups, which have considerable collective planning and decision-making autonomy, is that their members are engaged in the regulation of several central task areas, offering them many opportunities and choices to perform their

collective tasks (cf. section 2.1). According to the theoretical perspective, one can assume that complex structures of collective action regulation (types of groups with many possibilities of self-regulation) are not only manifested in mutually shared cognitive representations (Cranach et al. 1986), but also in common work means, external memory aids and so forth, as studies on the role of materializations within individual work tasks suggest (Hacker et al. 1998). Up to the present, there are hardly any empirical psychological studies on work groups that have tested this assumption.

In hypothesis 2, it is argued, that a high common task orientation and the occurrence of common objectifications are positively related. If this hypothesis will be confirmed, then some support will be gained for the assumption that common objectifications can serve as a material indicator for cooperative attitudes up to prosocial orientations, which are considered a component of work-related group cohesiveness. Inversely, if competitive (e.g. hierarchical thinking) and selfish orientations (e.g. idiocentrism) are dominant in a group, then only few jointly created objectifications are to be expected.

As presented earlier, a central construct of activity theory (Leont'ev, 1978) is that of objectification, which states an anthropological significance of human artefacts for the development of human culture, including patterns of interpersonal relations. Raeithel (1994) suggests in a conceptualization, which is based on several results of cultural anthropology, that symbolic and material objectifications contribute to the "symbolic production of social coherence". However, empirical investigations by activity theorists in an organization-related context are rare, yet becoming more frequent (e.g. Engeström and Middleton, 1996). Additionally, social psychologists in the tradition of Kibbutz research, like Shamir (1990), hinted that "collective work outcomes as public goods" are treated carefully in democratic enterprises (e.g. cooperatives) and play a supportive role in the development of interpersonal relations. Common tools and knowledge reservoirs may originate from work-related mutual support, and in turn, may foster prosocial orientations in a work group.

Hypothesis 3 states that – semi-autonomous – work groups with considerable possibilities of collective self-regulation (Group-type I to IV) will be stronger related to the components of a common task orientation than groups with less possibilities for collective self-regulation (Type V and VI). Compared with semi-autonomous work groups, a higher extent of competitive orientation, that is, hierarchical thinking and idiocentrism, is to be expected for groups of both latter types. Scholars in the tradition of Deutsch's theory of cooperation and competition reasoned from their experiments and empirical field studies that perceived common goals (positive goal interdependence) have a strong influence on cooperative attitudes and on observable behavior, while antagonistic, negatively interdependent goals foster competitive behavior (Tjosvold, 1998). Deutsch's theory gains additional support by Petrovsky's (1985) activity-theory oriented experiments and field studies on learning and working collectives in the former Soviet Union: Groups with common tasks and history demonstrated more shared and prosocial value orientations as well as better interpersonal relations than groups without common tasks or ad hoc groups. Theoretical support for hypothesis 3 is given by West's Concept of Group Task Reflexivity (West, 1996) and by socio-technical authors, who offered many reasons for the fruitfulness of constructs, like group-types, collective self-regulation, and common task orientation (e.g. Emery and Thorsrud, 1976; Susman, 1976; Alioth

and Ulich, 1981). Their empirical work is mostly based on case studies and should be further supported by quantitative studies.

Results

In this section, the summarized results of a first test of the described framework are given. For more results and informations about methods see Weber (1997). The sample is made up of 17 industrial work groups from two enterprises. Nine work groups stem from a (South) German automobile manufacturer; eight groups stem from an engine manufacturer, located in the German-speaking part of Switzerland. All groups have been existing for about 1 to 2 years. Groups of Type I and Type IV did not appear in this sample. Data on cooperation-relevant attitudes were tapped from 122 of the total 144 group members in summer of 1995 and in winter of 1995/96. The average age of the participants was 36.9 years ($SD = 10.7$); 4.4 percent were female.

Hypothesis 1: Group-types and common objectifications

The number of common objectifications was tapped at group-level by a theoretically-derived, qualitative classification scheme.

All observed common objectifications per group were added up and divided by the number of the members of the specific group, because it seems plausible that the size of a work group has an additional influence on the readiness to create common objectifications. The highly significant Kendall correlation (see Figure 4) between group-type (sample size

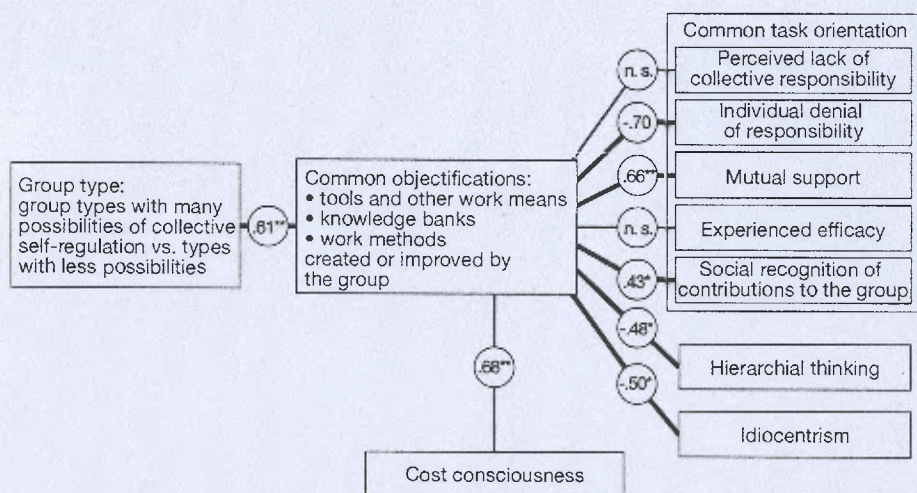


Figure 4. Correlations between group-type, common objectifications, and common task orientation ($N=17$ work groups).

$N = 17$ work groups) and the (weighted) number of objectifications per group of $r = .61$ ($p < .001$) supports the hypothesis: The more possibilities of collective self-regulation a work group has, the greater the number of common objectifications that are found. In the sample, the number of common objectifications in semi-autonomous groups of Type II and III (8 objectifications per group of these types) is more than twice as much, as in restricted groups of Type V with less, but moderate possibilities for collective self-regulation (3.1 objectifications per group). Compared with hierarchically led, highly restricted "groups" of Type VI (1.2 objectifications per group), the number of objectifications is about six times as much. Objectifications like planning and work methods (36.1 percent of all identified objectifications) dominate in the total sample, followed by material means of work (27.9 percent), as well as minutes and records (27.9 percent). Evaluation methods (6.6 percent), knowledge stores like data bases (4.9 percent), and visualizations (3.3 percent) play a minor role, but they represent tools that are not unimportant for certain groups.

Hypothesis 2: Common objectifications and common task orientation

Because a transactional relation between common artefacts (produced or improved in work groups) and common task orientation is assumed, a positive correlation between the number of common objectifications (weighted by group size) and positive indicators of common task orientation (mutual support and furtherance of others, experienced efficacy, social recognition of the member's contributions to the group) was predicted in hypothesis 2. Correspondingly, negative correlations between the number of objectifications and negative indicators of common task orientation (lack of collective responsibility, individual denial of responsibility, hierarchical thinking, idiocentrism) were expected. Accordingly, Pearson correlations were calculated at the group-level ($N=17$ work groups): The mean values of all eight cooperation-relevant indicators were calculated for each work group (aggregation of individual means per group and variable). Hypothesis 2 is supported mainly by the results documented in Figure 4. The higher the number of common objectifications in a group is, the less the members of the group show an individual denial of responsibility, and the higher is their readiness for mutual support, as well as their perceived social recognition of contributions for the group. Correlations between the number of objectifications and two further indicators (lack of collective responsibility, experienced efficacy) gained no significance. The number of objectifications shows a negative correlation to both indicators of competitive orientation as well as a positive correlation to the indicator of cost consciousness.

Hypothesis 3: Group-types and common task orientation

Using eight one-way analyses of variance to avoid in this case a data-aggregation for the cooperation-relevant indicators, it was investigated, whether members of work groups with more possibilities of collective self-regulation, for example members, who participate in two or more central task areas and who also have considerable collective regulation requirements (Group-type II and III), will demonstrate a higher level of common task orientation than members of groups with restricted possibilities of collective self-regulation (Type V), who themselves again show a higher level

than members of hierarchically-led groups (Type VI). In order to examine hypothesis 3, the independent variable group-type was split into three factor steps, because of the relatively rare occurrence of semi-autonomous group-types. Groups of Type I and Type IV did not occur at all. It is apparent from Figure 5 that the skew distribution of cell frequencies in the present sample could only be partially compensated for (N=121 group members). According to the type of his/her group, each group member was assigned to one of these three factor steps. Then, one-way analyses of variance were performed for each indicator of common task orientation, being the dependent variable. Figure 5 gives a summary of these results, including Cohen's *f* ratio as a measure for an assessment of the effect size of variance analytical differences.

The majority of the results support the assumption of a positive relation between the group-type and the extent of common task orientation, including related indicators.

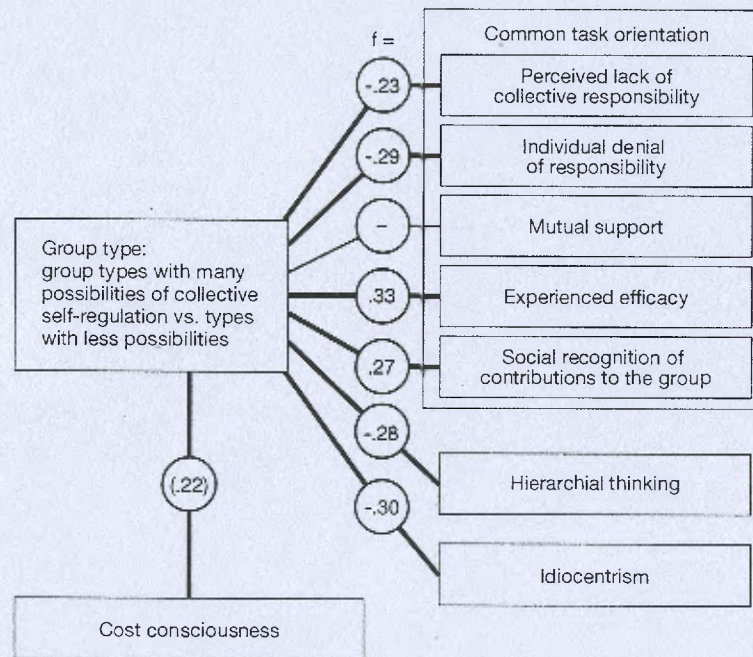


Figure 5. Variance-analytical relations between group-type and common task orientation.

Notes. *f*: Cohen's *f* ratio; N=120 to 122 group members

Three Factor steps

Semi-autonomous group-types:

Group-types II / III (many possibilities of collective self-regulation): 19 persons (out of 4 work groups)

Restrictive group-types:

Group-type V (moderate possibilities of collective self-regulation): 48 to 49 persons (out of 7 work groups)

Group-type VI (very few possibilities of collective self-regulation): 52 to 53 persons (out of 6 work groups)

Members from groups of a different type show significant differences in the expected direction with medium effect size regarding four (out of eight) relevant indicators:

- Individual denial of responsibility ($f = .29$; $df = 2/118$; significant difference of means between members from groups of Type II / III and from groups of Type VI; $p < .05$).
- Experienced efficacy ($f = .33$; $df = 2/117$; difference of means between Group-type II / III and Type V, as well as between Group-type II / III and Type VI; $p < .05$).
- Hierarchical thinking ($f = .28$; $df = 2/118$; difference of means between Group-type II / III and Type V, as well as between Group-type II / III and Type VI; $p < .05$).
- Idiocentrism ($f = .30$; $df = 2/117$; difference of means between Group-type II / III and Type VI; $p < .05$).

The difference of means between semi-autonomous and hierarchically-led groups for a fifth indicator, namely cost consciousness, nearly reaches the significance level ($f = .22$; $df = 2/119$; $p < .059$). The distribution of means is consistent with the predicted increase of possibilities of self-regulation from groups of Type VI to groups of Type II or III. Yet, the distribution is not quite contingent for the perceived lack of collective responsibility ($f = .23$; $df = 2/117$; difference of means between Group-type V and Type VI; $p < .05$) and for the social recognition of one's contributions to the group ($f = .27$; $df = 2/118$; difference of means between Group-type V and Type VI; $p < .05$). Here, the mean value of members from groups of Type V is equal or a little bit higher, respectively, than the mean value of members from groups of Type II/III. Contrary to hypothesis 3, no significant differences in the extent of mutual support were found.

Discussion and Conclusions

In general, the conceptual integration proposal Collective Action Regulation is supported by the majority of empirical results of the first study. As assumed in hypothesis 1, the correlation between commonly created or improved work means, as well as reservoirs of knowledge, and the group-type is strong and highly significant. The more possibilities of collective self-regulation exist, the more the group members engage in a common development of their own tools. Common objectifications not only appear in groups of semi-autonomous type (Type II and III), but – in reduced number – in groups with restricted autonomy (Type V), too. In hierarchically-led groups (Type V) they do not occur in large numbers (or at all). Metaphorically, there seems to be a tendency of a materialization of shared central tasks within moderate to considerable autonomy for common planning and decision-making. Furthermore (referring to hypothesis 2), the number of common objectifications is clearly related in the predicted direction to three out of five indicators of common task orientation, as well as to both indicators of competitive orientation. Additionally, a strong relation to cost consciousness was identified.

On the basis of these results, it makes sense to further investigate the role of common objectifications, not only referring to their supportive potential for group cohesiveness, but also in regard to their importance for knowledge transfer within and between teams. Recent research in the field of computer supported cooperative work (CSCW), as well as in social psychological laboratory experiments about task characteristics and process criteria, could

be reviewed with reference to group-types, common artifacts, and prosocial behavior.

As assumed in hypothesis 3, members from groups that belong to group-types with considerable possibilities of self-regulation (Type II and III) significantly differ in most cases from members of groups with only few possibilities (Type VI), and in some cases from members of groups with moderate possibilities (Type V) by a lower degree of competitive attitudes and a higher degree of prosocial attitudes. With some limitations, this supports the assumption that considerable possibilities of collective self-regulation foster prosocial work orientations in the long term and reduce selfish or competitive orientations. In both enterprises, there was no personnel selection that could have caused these effects. Contrary to hypothesis 3, no significant relationship between group-type and readiness for mutual support, including furtherance of others, was found. This is surprising. Possibly, influencing factors, which have been emphasized in small group research, such as interpersonal conflicts, may have had an effect and overlapped the influences of the group-type. Moreover, the operationalization of certain aspects of mutual support was perhaps not adequate. In principle, it would be desirable to tap the indicators of common task orientation on the basis of observable behavior in the group and thus to validate, where the case, the attitudes and perceptions.

All in all, with the present empirical study, the assumption is strengthened that groups of a semi-autonomous type foster prosocial work orientations as well as common objectifications. From a (mainstream) social psychological viewpoint, the presented framework could be criticized, because it has a different normative conception of man than exchange theories or valency-expectancy theories postulate. There are enough empirical results that demonstrate the everyday occurrence of selfishness in capitalistic market-economies; they lend validity to the cited theories. But, on the other hand, wouldn't this view be dominated too much by managerial economics' short-term view and also neglect the developmental perspectives of work-related prosocial orientations? In a humanistic perspective, autonomous group work can act as an important instrument for personal development, having its own legitimacy.

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