

Effects of Power on Team Processes and Performance: Does the Way in which Power is Used Make a Difference?

Paper was presented at the
8th International Workshop on Teamworking (IWOT 8) in Trier, September 16 – 17 2004.

Ulrich Klocke

Humboldt University of Berlin

Faculty of Mathematics and Natural Sciences II

Institute of Psychology

Organizational and Social Psychology

Rudower Chaussee 18

D - 10099 Berlin

Germany

Phone: ++49 (0) 30 / 20 93 - 93 35

Fax: ++49 (0) 30 / 20 93 - 93 32

Email: klocke@rz.hu-berlin.de

www.psychologie.hu-berlin.de/orgpsy/mitarbeiter/klocke.htm

The data reported have been part of the author's doctoral dissertation.

Content

1	POWER EXERTION IN PROBLEM-SOLVING TEAMS.....	3
2	AIMS OF THE PRESENT STUDY AND THEIR OPERATIONALIZATION.....	4
2.1	IDENTIFYING MEDIATING PROCESSES.....	4
2.2	CLARIFYING AREA OF VALIDITY	6
2.3	MAXIMIZING ECOLOGICAL VALIDITY.....	7
	<i>Heterogeneous Sample</i>	7
	<i>Sincerity</i>	7
	<i>Complex Group Task with Face to Face Interaction</i>	7
2.4	ENSURING CAUSAL INTERPRETATIONS	8
	<i>Experimental Design</i>	8
	<i>Selection of the Actor</i>	8
	<i>Manipulation of the Power Base</i>	8
	<i>Manipulation of the Control Mode</i>	9
3	RESULTS	9
3.1	GENERAL INFORMATION ABOUT THE ANALYSES	9
3.2	EXPERIMENTAL EFFECTS	10
	<i>Reactance and Helplessness</i>	10
	<i>Task Knowledge</i>	11
3.3	MEDIATOR ANALYSIS.....	13
	<i>Why less Task Knowledge after Restrictive Control?</i>	13
	<i>Why less Task Knowledge due to Helplessness?</i>	13
3.4	REGRESSION RESULTS	14
3.5	MODERATOR ANALYSIS.....	14
	<i>Pre-level of Action Capability x Control Mode</i>	15
	<i>Competence Lead of the Actor x Control Mode</i>	15
4	SUMMARY OF RESULTS AND DISCUSSION	16
4.1	FOUR AIMS OF THE EXPERIMENT	16
4.2	PRACTICAL CONCLUSIONS.....	17
5	REFERENCES.....	18

Abstract

223 participants in 62 teams worked together on a complex Assessment Centre task. Two independent variables were manipulated. 1. Power base: One person in each group (the actor) was presented as having expert vs. position power. 2. Control mode: The actor was instructed to ignore the interests of the other members (the targets) (restrictive control) vs. to influence them in line with their interests (promotive control).

As expected, independent of the power base, actors using restrictive instead of promotive control acquired less knowledge about the task. This effect was mediated by higher helplessness of the targets. The effect of control mode on action capability of the team (ability to make and implement decisions) was moderated by the pre-level of action capability. The effect on team performance was moderated by the difference in competence between actor and targets (not sign).

1 Power Exertion in Problem-Solving Teams

Task complexity and potential availability of information increase in economy, science and politics (Klotz, 1999; Reichwald & Möslein, 1999). To reach adequate solutions (e.g. develop new products), different areas of knowledge and experiences have to be integrated. Because this would be too much for single individuals, teams of different experts are appointed to solve problems jointly. Therefore, this paper starts with the following questions: How can the acquisition and application of knowledge in teams be promoted? Does the kind of power exertion make a difference?

To answer these questions it should be clarified which kinds of power exertion can be distinguished. Usually, *social power* is defined as a capacity to influence or control other people, which means to change their behaviour or experience (e.g. French & Raven, 1959; Keltner, Gruenfeld, & Anderson, 2003). Like Scholl (1991b; 1999) and Buschmeier (1995), I distinguish two different ways in which this capacity can be used depending on the consideration of the interests of the target(s). These two different *control modes* are

- *restrictive control* which is defined as power exertion against the interests of the target person and
- *promotive control* which is defined as power exertion in line with the interests of the target person.

In the German language, restrictive control can also be referred to as *Machtausübung* (*power exertion* but with a harsher meaning than in English), whereas promotive control can also be called *Einflussnahme* (*influence*). This distinction is comparable to definitions of Etzioni (1968) and Abell (1977). Field studies in organizations (Buschmeier, 1995; Scholl, 1996) support the separation of restrictive and promotive control by demonstrating different relationships with knowledge acquisition and effectiveness.

Additional evidence comes from comparable research traditions, e.g. on leadership styles or on influence tactics. The behaviour of leaders is often analysed according to the degree of subordinate **participation in decision making**. In total, effects of participation are inconsistent and not very strong (Doucouliagos, 1995; Sagie, 1994; Wagner & Gooding, 1987). However, especially formal, direct and long-term participation in organizations leads to higher performance (Cotton, Vollrath, Froggatt, Lengnick-Hall, & Jennings, 1988; Wagner, 1994). Apart from that, there is evidence that participative leadership style promotes knowledge acquisition in groups. This is demonstrated in case of creativity (Plunkett, 1990), innovation (De Dreu & West, 2001) and information processing in groups (Esser, 1998; Larson, Foster-Fishman, & Franz, 1998). Some authors identified moderator variables: They show for example that participative leadership especially leads to more performance if the leader doesn't have more knowledge or skills about the task than the followers (Murphy, Blyth, & Fiedler, 1992; Scully, Kirkpatrick, & Locke, 1995).

The opportunity to participate in decision-making should increase the probability for subordinates to support their interests. Thus, a distinction of power exertion into restrictive

and promotive control might be relevant to explain differences between authoritarian and participative leadership style.

A lot of research analyse the variety of strategies or tactics people use to influence their spouses, bosses, colleagues or co-workers. Some authors differentiate these **influence tactics** regarding their harshness, that means the degree in which they restrict the freedom of the target (Buschmeier, 1995; Falbe & Yukl, 1992; Kipnis & Schmidt, 1985). Field studies show that soft tactics like *rational persuasion*, *inspirational appeal* or *consultation* correlate positive with positive affective reactions of the targets or performance whereas harsh tactics like *pressure* correlate negative with performance and positive with resistance (Buschmeier, 1995; Higgins, Judge, & Ferris, 2003; Blickle, 2003; Falbe & Yukl, 1992; Yukl & Tracey, 1992). These studies relate to the distinction of restrictive and promotive control because harsh tactics are more suitable for restrictive whereas soft tactics are more suitable for promotive control (Buschmeier, 1995).

To sum up, using power in line with the interests of the other team members (promotive control) is supposed to result in more knowledge acquisition and higher team performance than promoting own interests at the expense of the targets (restrictive control). This effect is supposed to be enhanced if the relevant competence of the actor is not higher than the competence of the targets.

2 Aims of the Present Study and their Operationalization

The present study serves four goals. Firstly, it should explain *why* negative effects of power might result if it is used restrictively. What are the mediating individual and team processes? Secondly, the area of validity of these effects should be clarified with respect to the underlying sources or bases of power. Thirdly, the study should be as much applicable as possible for a laboratory study to real expert teams in organizations. That means, ecological validity should be maximized. And last but not least, a methodological weakness of all available studies about control mode or influence tactics and a lot of studies about participative leadership should be prevented: Because these studies are correlational and cross-sectional, it is as likely that bad circumstances like low performance or conflicts in the team lead to restrictive control than the other way round. This chapter focuses on the way these four aims were reached in the present study.

2.1 Identifying Mediating Processes

In order to identify the mediating processes of power effects, the subjective experience of team members was measured via questionnaires. The communicative behaviour while solving the group task was measured via an video-based categorization of every utterance. The instruments are described in chapter 3.2 and were based on the theoretical model in Figure 1. An extended model which includes cognitive reactions of the actor as well as

transactive knowledge (meta-knowledge about the task knowledge of each team member) is presented in the doctoral thesis of the author (Klocke, 2004). A submitted article (Klocke, submitted 2004) focusses on the cognitive reactions of the actor.

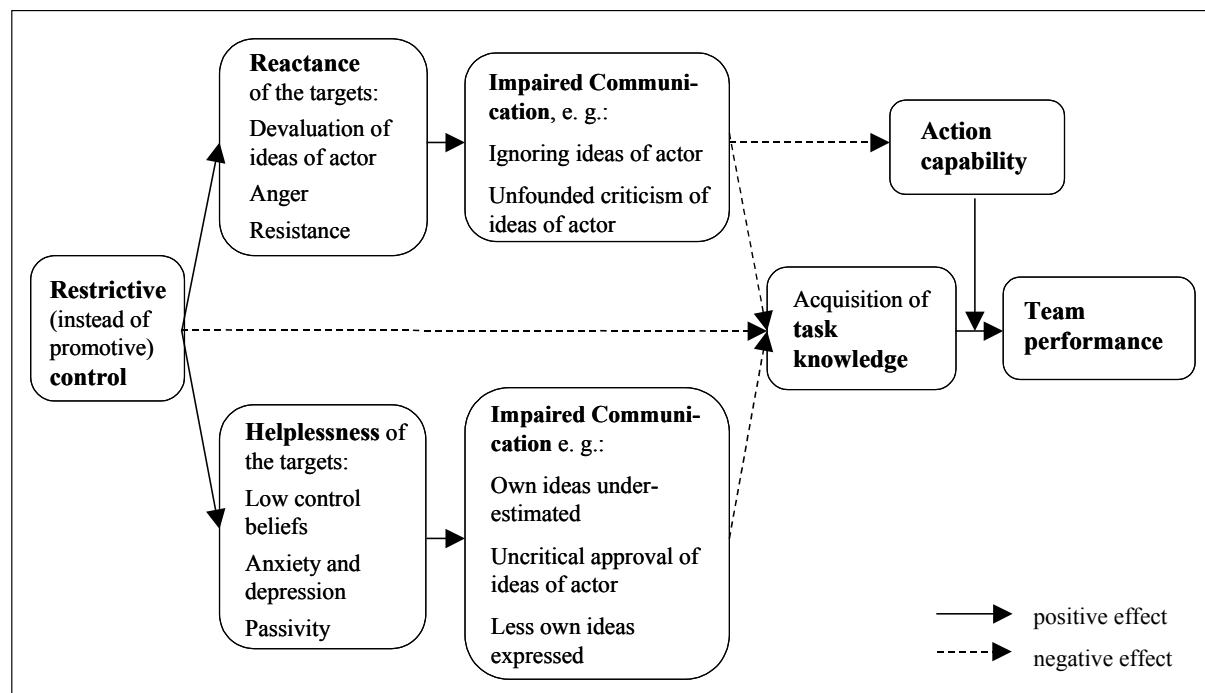


Figure 1: Model of power exertion and team performance

In the following, the theoretical model of power exertion and team performance (see Figure 1) is described. Restrictive control is associated with a reduction of targets' freedom to choose between different action or outcome alternatives. For example the actor interrupts the target so that he or she isn't able to finish a statement. Or the actor makes a decision that affects the other team members without asking in advance. According to Wortman & Brehm (Wortman & Brehm, 1975), a restriction of freedom which is perceived as illegitimate by the targets first leads to *reactance* because people have a motive to control their own fate. Reactance is defined as an arousal which motivates to re-establish the lost or threatened freedom. In case the restriction of freedom lasts long or the individual has encountered such situations repeatedly, he or she will experience *helplessness* (Wortman & Brehm, 1975). In my view, reactance as well as helplessness are psychological states with cognitive, affective and conative (intentional or behavioral) components. Reactance is accompanied by a feeling of anger (affective component) which is likely to inhibit higher cognitive processes (Bodenhausen, Sheppard, & Kramer, 1994; Bohner, Hausschildt, & Knäuper, 1993; Zillmann, 1994), so that valuable ideas might be ignored. Suggestions which are forced onto the team by the actor are devalued (cognitive component) and the likelihood of open resistance (conative component) is enhanced which should result in unfounded criticism of his or her ideas.

Helplessness implies that the target doesn't recognize actual contingencies between own behaviour and outcomes (cognitive component: low control beliefs). In the case of joint

problem-solving in a team this means an underestimation of own ideas about the problem. Since the target fears further aversive actions of the actor (affective component), he or she might approve to the ideas of the actor quick and uncritical. Anxious (like angry) arousal can be expected to interfere with higher cognitive processes (Pekrun & Schiefele, 1996; Seipp & Schwarzer, 1991). Enhanced evaluation anxiety also leads to passivity (conative component), so that own ideas, especially if they are deviating from group consensus are held back. All these effects on individual information processing as well as team communication suggest that team members learn less about the task if power is exerted restrictively than if it is exerted promotively. Restrictive control interferes with knowledge acquisition because targets respond with reactance or helplessness (Buschmeier, 1995).

If teams have to cope with complex tasks like it often is the case in project teams of different experts, members need to exchange present and acquire new knowledge about the task to perform well. But is knowledge really enough to be effective? In particular, teams (compared to single individuals) often fail in spite of a huge amount of expertise of its members. In order to apply the present task knowledge, teams have to be able to make clear decisions and to implement these decisions (*action capability*, Scholl, 1996). Therefore, a positive interaction effect of task knowledge and action capability on performance is expected. The action capability of a team is threatened by coordination losses (e.g. due to conflicts or insufficient communication) as well as motivation losses (e.g. due to diffusion of responsibility). It is likely that these process losses (Latané, Williams, & Harkins, 1979) increase if targets respond with reactance so that action capability is reduced. On the other hand, there might be situations in which restrictive control by one legitimised person can stabilize the action capability of a team: If the action capability is low, vigorous action can rise it to a medium level.

2.2 Clarifying Area of Validity

Are the supposed effects of the control mode only valid under specific circumstances or are they founded on general rules? It is impossible to answer this question in one study, so the present study does focus on one additional independent variable: the source on which the power of the actor is based. Probably the most widely known taxonomy of **power bases** is of French and Raven (1959), who distinguished between the following five: reward, coercive, legitimate, referent and expert power. This taxonomy is refined by Raven, Schwarzwald and Koslowsky (1998) who distinguished between eleven different power bases. I assume that all power bases can be used for promotive as well as for restrictive control (Buschmeier, 1995). In the present study, the following two power bases were chosen:

- *expert power* which is the capacity to influence the targets because they attribute knowledge or skills to the actor and
- *legitimate power of position* (shortened to: *position power*) which is the capacity to influence on base of (organizational) rules, which are accepted by the targets and legitimise the actor to determine their behaviour.

The expected effects of promotive compared to restrictive control are supposed to be the same, regardless of whether they are based on expert or on position power (no interaction effect between control mode and power base). The relevant variable that determines the outcome of power exertion is the treatment of the target's interests (main effect of control mode).

2.3 Maximizing Ecological Validity

Group studies in the laboratory were often criticized for being artificial and lacking practical relevance for real organizational teams (Scholl, 1997). A lot of times, only psychology students were analysed on a short and simple task with no relevance for them. The other group members were only simulated via paper or electronic messages. In order to maximize ecological validity in the present study, the following measures were taken:

Heterogeneous Sample

The sample consisted of 82 % students from a lot of different disciplines: mainly language and communication sciences (21 %), natural sciences (20 %), social sciences (18 %) and jurisprudence (16 %). Mean age was relatively high ($M = 27$ years, $SD = 5$ years) because most of the students were in their last semesters. 54 % were female and 46 % male. In total 223 people participated divided into 62 mixed-gender teams of three or four people.

Sincerity

To secure high motivation of the participants, the study was advertised as an Assessment Centre exercise with the possibility of receiving feedback on one's own performance and team behaviour (e.g. assertiveness and cooperativeness). Participants were compensated depending on the performance of their team (600 € in total for all participants).

Complex Group Task with Face to Face Interaction

Team members interacted face to face on a computer-simulated shirt company, the *Schneiderwerkstatt* (Süß & Faulhaber, 1990). The *Schneiderwerkstatt* is a complex task of which the validity is established for individual performance (Kersting, 1991, 1999; Süß, 1991). Teams were supposed to maximize the capital of the company with a set of twelve possible interventions (input variables), including the purchase of machines, hiring or firing workers, changing advertising expenditure, etc. After each simulated month, the effects on twelve different output variables were visible: capital, demand, clothes in stock, motivation of workers, etc. The teams performed two different versions of the *Schneiderwerkstatt*. For the first version, they were given fifteen minutes for three simulated months. For the second version, which had different starting values, they had one hour for twelve simulated months. Between the two versions, pre-tests of the dependent measures were taken and the experimental manipulations were introduced (see next chapter).

2.4 Ensuring Causal Interpretations

Experimental Design

With the purpose of being able to judge about cause and effect, both independent variables were manipulated experimentally between groups: (a) power base: expertise vs. position, (b) control mode: restrictive vs. promotive. Groups were randomly assigned to the experimental conditions. After 30 teams had participated, the experimental manipulations were improved, meaning that there were two sets of experiments. While regression analysis was carried out on the total sample, experimental analysis was carried out on 110 participants in 31 teams of the second set of experiments. Therefore, the following descriptions pertain only to the second set of experiments.

Selection of the Actor

To enhance the probability of power exertion, for each team one person was selected as the actor on base of four indicators that were assessed by a pre-mailed questionnaire: (a) grade of the Abitur (university entrance exam) and last grade received in mathematics while at school, (b) leadership experience and attitude, (c) propensity for exertion of restrictive and (d) promotive control in fictitious situations. These four indicators were multiplied to prevent a compensation of low values in one indicator with high values in another. From approximately every twenty participants, only males with the highest power scores were selected.

Manipulation of the Power Base

In the **expert power condition**, the actor was given fifteen minutes to make notes while reading an expert text including important information on how to manage the shirt company. Afterwards all participants were given enough time to read their role instructions for the second version of the *Schneiderwerkstatt*. The shirt company was introduced as being owned by all three or four members of the group, meaning that everybody had the same rights. The actor was introduced as the one with the best abilities to manage the shirt company according to the expert text, the quality of his contributions in the first version of the *Schneiderwerkstatt* and his scores in the pre-administered performance tests¹. Depending on team performance, raffle tickets (to win 300 €, second experimental set) were announced and distributed equally within the teams.

In the **position power condition**, the actor was introduced as the owner of the company and the targets as his employees. He was allowed to delegate tasks and make decisions on his own if desired. He had the computer keyboard in order to be able to implement his decisions. The compensation with raffle tickets for the actor (owner) depended on group

¹ These performance tests were: 1. the intelligence subscale *Sequence of Numbers* from the WILDE Intelligence Test (WIT, Jäger & Althoff, 1983), 2. the pretest of task knowledge (see chapter 3.2).

performance in a linear fashion, while the targets (employees) received a constant salary plus a bonus if the capital of the shirt company was above average at the end of the simulation.

To check the **success of the manipulation** of power base, targets were asked why the actor had influenced them. *Perceived expert power* was measured with two items (Cronbach's $\alpha = .58$), *perceived position power* with four items (Cronbach's $\alpha = .87$). In the second set of experiments, univariate analyses of covariance (pre-tests included as covariates) showed huge effects of power base on perceived expert power, $F(1, 26) = 17.16$, $p < .001$, $\eta^2 = .40$, as well as on perceived position power, $F(1, 25) = 11.92$, $p < .01$, $\eta^2 = .31$, both in the expected directions.

Manipulation of the Control Mode

In his written role instruction, the actor was told to exert his power as restrictive or as promotive control respectively. Some examples for relevant behaviour were given, e.g. in the case of **restrictive control** to decide against the wishes of the targets if necessary or to interrupt fruitless discussions, and in the case of **promotive control** to find a solution that fits everybody's interests or to ensure that each member is given sufficient opportunity to speak. A distribution of additional raffle tickets (for every group member to earn another 300 €) was announced depending on how convincingly the instructions were represented.

To check the **success of the manipulation** of control mode, after the second version of the *Schneiderwerkstatt*, the definitions of restrictive and promotive control were explained to the targets and they were asked to what degree the actor used these two control modes to influence them. Perceived restrictive and promotive control respectively were assessed by four items each (Cronbach's $\alpha = .85$ and $.70$ respectively). Perceived dominance and friendliness of the actor after the first *Schneiderwerkstatt* were included in the analyses as covariates (Cronbach's $\alpha = .69$ and $.81$ respectively). Over all four conditions, on average, targets perceived more promotive control ($M = 3.7$, $SD = 0.7$) than restrictive control ($M = 2.4$, $SD = 0.7$, scales from 1 to 5). Perceived restrictive control of the actor was strongly influenced in the expected direction by control mode, $F(1, 25) = 7.95$, $p < .01$, $\eta^2 = .24$. For perceived promotive control, the expected effect occurred only under position power (contrast with one-tailed $p < .10$). In total, this means that experimental effects of control mode can be explained predominantly by a difference in *restrictive* control of the actor.

3 Results

3.1 General Information about the Analyses

If the skewness of a variable exceeded 0.8, for statistical analysis, it was transformed using the formulae suggested in Tabachnik and Fidell (1989). Values outside an area of three

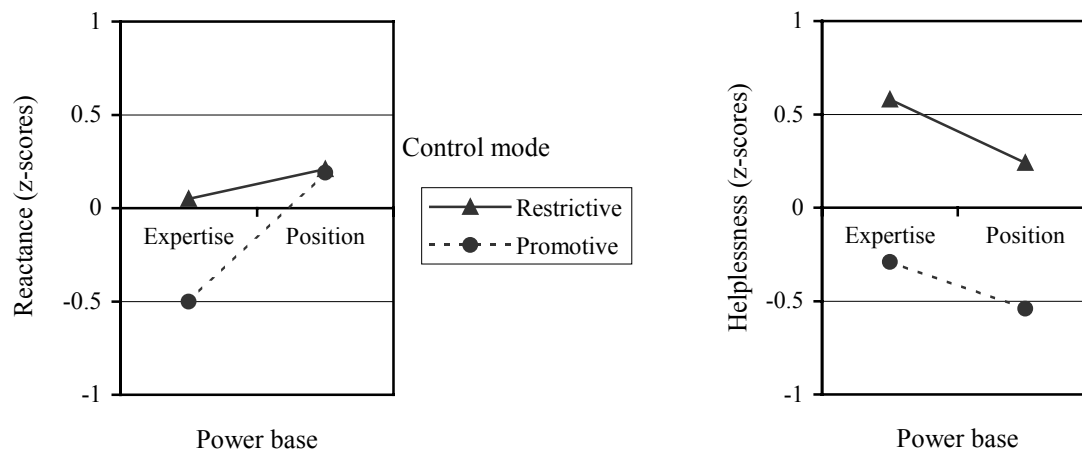
standard deviations from the mean were considered as outliers and transformed in a value of $M \pm 3 SD$ (Tabachnik & Fidell, 1983). Factor analyses and reliability analyses for aggregation of items as well as transformations and outlier analyses were carried out with individual-level data. All other analyses were carried out on the group level. All dependent variables were measured before (pre-test) and after (post-test) the experimental manipulations and the second version of the *Schneiderwerkstatt*. To enhance test power, the post-tests of some variables contained more items than the pre-tests (Maxwell, 1994). The pre-test of the dependent variable and sometimes also pre-tests of comparable variables were included in the analyses as covariates or additional predictors to reduce error variance and enhance test power. In addition, this leads to more confidence in the direction of causality for regression analyses as well (the fourth aim of the study, see chapter 2.4): β -weights do not merely reflect effects of prelevel of criterion variable on predictor variables. When only one set of experiments is analysed, a more liberal α level of 10 % is accepted to prevent the loss of too much test power due to small sample size.

3.2 Experimental Effects

No significant experimental effects on action capability or performance of the teams could be found. Action capability was assessed by five items, e.g. “While leading the shirt company, clear decisions were made.” or “... made decisions were translated into action.” (Cronbach’s $\alpha = .71$, $M = 3.9$, $SD = 0.3$, scale from 1 to 5). Team performance was measured by the capital after managing the shirt company for twelve simulated months.

Reactance and Helplessness

Reactance of the targets was measured by presenting eight statements about cognitive, affective and conative responses, for example “What rubbish!“, “irritated” and “... to interrupt him” (Cronbach’s $\alpha = .83$). On average, the targets reported hardly to have experienced reactance ($M = 2.0$, $SD = 0.5$, scale from 1 to 5). No significant effect on this variable was found in the analysis of covariance (see Figure 2). However, under expertise, there is a significant contrast between restrictive and promotive control (one tailed $p < .10$): As expected, restrictively controlling experts provoked more reactance than promotively controlling experts.



Source of variance	df	F	η^2
Control Mode	1, 26	1.28	.05
Power Base	1, 26	2.71	.09
Mode x Base	1, 26	1.05	.04

Source of variance	df	F	η^2
Control Mode	1, 26	9.52	** .27
Power Base	1, 26	1.27	.05
Mode x Base	1, 26	.03	.00

Notes: The pre-test of the dependent variable was included as covariate. ** $p < .01$

Figure 2: Reactance and helplessness of the targets as a function of control mode and power base

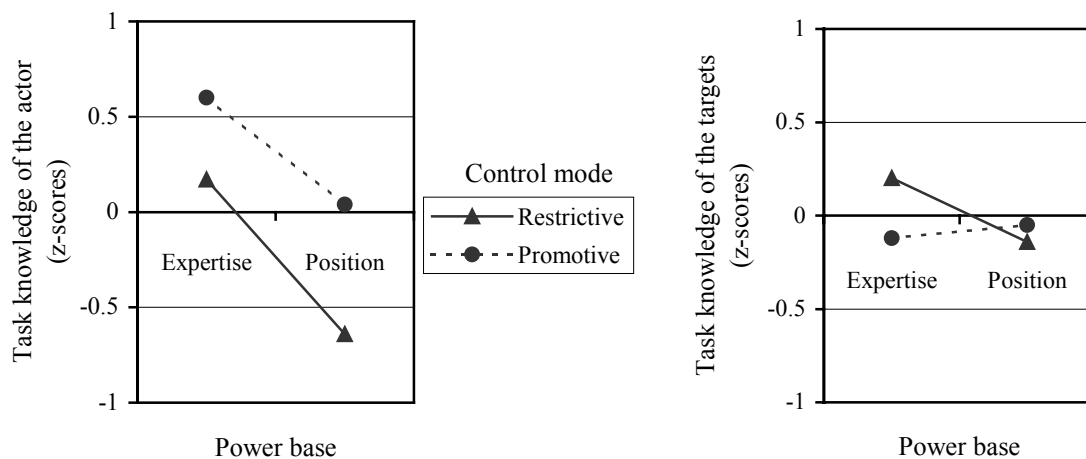
Helplessness of the targets was measured by eight cognitive, affective and conative responses, for example „I can't concentrate.“, „intimidated“ and „I felt as if I were paralysed.“ (Cronbach's $\alpha = .86$). As for reactance, targets hardly approved to this items ($M = 1.8$, $SD = 0.3$, scale from 1 to 5). In agreement with the theoretical model (see Figure 1), targets experienced much more helplessness if the actor had exerted his power restrictively (see Figure 2).

Task Knowledge

To measure the task relevant knowledge all participants individually completed a short version of a performance test on the knowledge about the *Schneiderwerkstatt*, created on base of content validity by Kersting (1991; see also Kersting & Süß, 1995). The test assessed system knowledge about the relations and properties of the variables in the *Schneiderwerkstatt* (pre-test: 6 items, post-test: 17 items) as well as action knowledge about rules of thumb on how to manage the shirt company (pre-test: 7 items, post-test: 21 items). After the exclusion of six items with a negative part-whole correlation, Cronbach's α is .69.

On average, participants obtained 18.0 points ($SD = 3.3$ points) with a maximum possible score of 37 points. A $2 \times 2 \times 2$ analysis of covariance was performed with control mode and power base as between-group factors and role (actor vs. targets) as within-group

factor. The six covariates consisted of task and transactive² knowledge as well as the WIT-intelligence-subscale *Sequence of Numbers* (Jäger & Althoff, 1983) of both the actor and the targets (3 variables x 2 roles). The following significant effects emerged: Control mode, $F(1,21) = 3.86$, $p < .10$, $\eta^2 = .16$; power base, $F(1,21) = 8.62$, $p < .01$, $\eta^2 = .29$; interaction of role and control mode, $F(1,21) = 3.67$, $p < .10$, $\eta^2 = .15$; interaction of role and power base, $F(1,21) = 3.55$, $p < .10$, $\eta^2 = .15$. The direction of the effects is shown in Figure 3, which presents the results of two separate analyses of covariance, one for the actor and one for the targets.



Source of variance	df	F	η^2
Control Mode	1, 21	5.73	* .21
Power Base	1, 21	8.41	** .29
Mode x Base	1, 21	0.32	.02

Source of variance	df	F	η^2
Control Mode	1, 21	0.12	.01
Power Base	1, 21	0.15	.01
Mode x Base	1, 21	0.37	.02

Notes: Pre-tests of task knowledge, transactive knowledge and WIT-subscale *Sequence of Numbers* of both actor and targets were included as covariates. * $p < .05$, ** $p < .01$

Figure 3: Task knowledge as a function of control mode and power base

The interaction effects between role and control mode as well as role and power base are due to the fact that effects of control mode and power base emerge only for the actor but not for the targets. “Experts” knew much more about the *Schneiderwerkstatt* than “company owners” which can easily be explained by the expert texts. As expected, promotively controlling actors acquired more task knowledge than restrictively controlling actors.

² Transactive knowledge was also assessed in the present study and is defined as meta-knowledge about the task knowledge of each team member.

3.3 Mediator Analysis

Why less Task Knowledge after Restrictive Control?

The first aim of this study (see Chapter 2.1) is to identify the mediating processes of the effects of control mode. Therefore, mediator analyses (Baron & Kenny, 1986) were performed with task knowledge of the actor as dependent and reactance and helplessness of the targets as mediating variables. Whereas reactance doesn't fulfil the criteria of a mediator variable, helplessness does (see Table 1). The experimental effect of control mode on task knowledge of the actor (third column) disappears after the inclusion of helplessness in the regression equation (fourth column).

Table 1: Mediator analysis of the effect of restrictive control on task knowledge of the actor

Predictor variables ↓	Criterion variables (post)		
	MV: Helplessness (T)	DV: Task knowledge (A)	DV: Task knowledge (A)
IV: Restr. control (vs. prom.)	** .42	* -.29	-.13
MV: Helplessness (T, post)	----	----	* -.32
Expert power (vs. position)	.15	** .36	** .37
Restrictive control x expertise	.02	.07	.10
Helplessness (T, pre)	** .52	----	----
Task knowledge (A, pre)	----	** .49	** .45
Task knowledge (T, pre)	----	.18	.13
Transactive knowledge (A, pre)	----	* .40	** .52
Transactive knowledge (T, pre)	----	* -.40	** -.45
WIT: Seq. of Numbers (A, pre)	----	.20	.22
WIT: Seq. of Numbers (T, pre)	----	-.07	-.16
R^2 (adjusted R^2)	** .54 (.47)	** .75 (.65)	** .81 (.72)

Notes: N = 31 teams. Standardized β -weights are presented.

A = actor, T = targets, IV = independent variable, MV = mediator variable, DV = dependent variable

* $p < .05$ ** $p < .01$

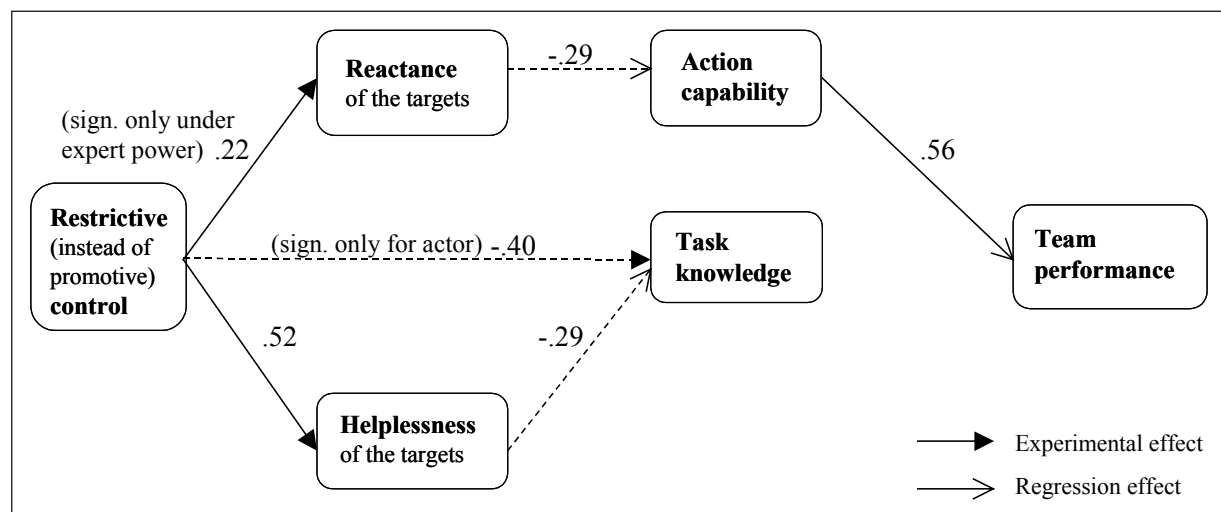
Why less Task Knowledge due to Helplessness?

In order to explain the effects of the subjective experience of the targets (reactance and helplessness) on the dependent variables, a video-based analysis of the communication behaviour in 22 teams of the second experimental set was performed. Based on an evolutionary model of knowledge acquisition (Campbell, 1974; Scholl, 1991a) behavioral indicators were aggregated to constructs (Klocke, 2004; Ronzheimer, 2004). Correlations of these constructs with helplessness as well as with task knowledge were computed. To enhance

confidence in causal judgments, the pre-test of the criterion variable and the power base were partialled out (the latter because of the influence of the expert text). The amount of targets' unfounded and simple suggestions what to do next (e.g. "Let's hire two workers.") correlates positively with helplessness ($r = .38, p < .10$) and negatively with task knowledge (for the team: $r = -.47, p < .05$; for the actor: $r = -.14, n.s.$; for the targets: $r = -.42, p < .10$). To sum up, restrictively controlling actors learned less from the targets because they react helpless and thus contribute more unfounded simple ideas.

3.4 Regression Results

The model in Figure 1 is further analysed by performing regression analyses of action capability, task knowledge and team performance on the assumed predictors. For team performance, the assumed interaction between action capability and task knowledge didn't emerge. Instead, a huge main effect of action capability was found (see Figure 4). Action capability itself can be accounted for by reactance of the targets. In sum, a negative long term effect of restrictive control on team performance mediated by reactance and action capability is possible (two part causal sequence, Kirkpatrick & Locke, 1996). In order to summarize all results related to the model, the experimental results are presented in Figure 4 as well.



Notes: η -coefficients are presented for **experimental effects** with one tailed $p < .10$ on $N = 31$ teams. Standardized β -weights are presented for **regression effects** with $p < .05$ on $N = 62$ teams. The pre-test of each dependent variable is entered as predictor. For task knowledge, also the expert text for the actor in the second experimental set is entered.

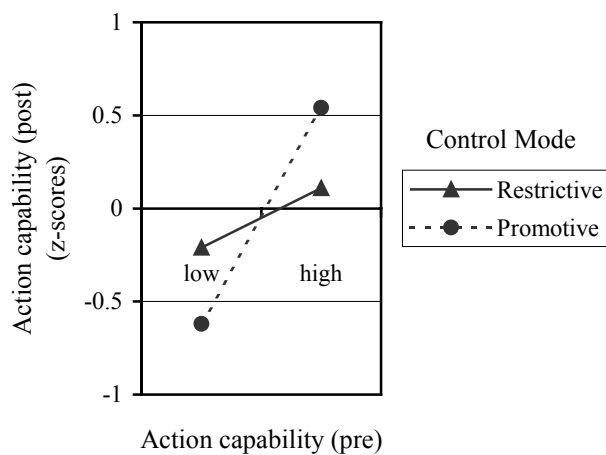
Figure 4: Regression and experimental results with respect to the model of power exertion and team performance

3.5 Moderator Analysis

Two moderator variables of the effects of control mode were discussed in chapters 1 and 2.1: (a) the pre-level of action capability and (b) the competence lead of the actor (compared to the targets).

Pre-level of Action Capability x Control Mode

To test this moderation a regression of the post-test of action capability on power base, control mode, the pre-test of action capability as well as the product term of z-standardized scores of the pre-test of action capability and control mode was computed. The standardized β -weight of the product term is $-.24$ (one tailed $p < .10$). The moderator effect is visualized in Figure 5 by means of a split of the sample at the median of the prelevel of action capability. As expected, if action capability is under average, restrictive control by the actor can enhance it to a medium level. If, on the other hand, action capability is high, promotive control outperforms restrictive control.

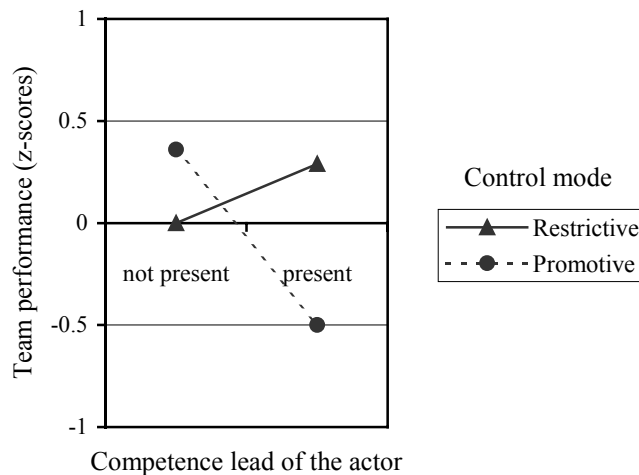


Notes: Power base was entered as a covariate.

Figure 5: Action capability (post) as a function of control mode and action capability (pre)

Competence Lead of the Actor x Control Mode

The competence lead of the actor was estimated as follows: In each team, for the actor as well as for the targets, the (average) pre-levels of task knowledge as well as *Sequence of Numbers* (WIT) were summed up. The sum of the targets was subtracted from the sum of the actor. The standardized β -weight for the product term of control mode and competence lead in a regression of team performance is $.23$ (one tailed $p = .130$). So the moderator effect isn't statistically significant, but in the expected direction as Figure 6 demonstrates.



Notes: Power base was entered as a covariate.

Figure 6: Team performance as a function of control mode and competence lead

4 Summary of Results and Discussion

The present experiment demonstrates that it is in fact important *how* power as a capacity to influence or control other people is used to explain its effects on knowledge acquisition in teams. An essential variable that distinguishes between different control modes is the regarding of the interests of the targets. If these interests are disregarded (restrictive control), targets react more helpless and the actor learns less about the task than if targets' interests are respected (promotive control).

4.1 Four Aims of the Experiment

What can be stated about the four aims of the present study in the face of the results? The first aim was to identify the **mediating process** of the effects of control mode. The results show that restrictive control interferes with knowledge acquisition of the actor because the targets react helpless. In teams with helpless targets more “helpless” contributions (unfounded and simple ideas) are made during communication which obstruct learning about the task. No experimental main effects of control mode on action capability and performance of the team were found. However, the results are in agreement with a negative long-term effect of restrictive control on team performance. At least under expert power, disregarding targets' interests provokes reactance which interferes with the ability of the team to make clear decisions and implement them (action capability). Action capability is an important prerequisite of effective teamwork. At least for the short term, action capability seems to be more important for team performance than explicit task knowledge. However, in the long run, acquired knowledge might get more important to solve new and complex problems.

With respect to the second aim (**clarifying area of validity**), it is analysed whether mode-effects are independent of the power base. For the variables in focus, this in fact is the

case. There are no interaction effects between power base (expertise vs. position) and control mode. However, for reactance, the expected mode-effect only emerged under expert power, whereas under position power, there is a tendency for more reactance, no matter which control mode is used.

Measures to **maximize ecological validity** (third aim) were already presented in chapter 2.3. In the following, possible restrictions of validity were considered. Like in most laboratory experiments participants didn't know each other in the beginning and interacted only for a short time with no long term perspective. Usually in practice team members have the possibility to get to know each other better. In addition, teams in this experiment were working under time pressure. The short term character together with scarce time might favour restrictive compared to promotive control and thus lead to a conservative test of the assumptions. So it can be suspected that in real organizational teams effects of control mode are even stronger than in such a laboratory experiment. There is also the fact that targets on average perceived much more promotive ($M = 3.7$, $SD = 0.7$) than restrictive control ($M = 2.4$, $SD = 0.7$) by the actors. This was also the case in the restrictive condition (albeit to a lesser extent than in the promotive condition). Perhaps some of the proposed effects of restrictive control could only be found under conditions in which restrictive control really exceeds promotive control, i.e. in which disregarding interests in some influence attempts is not compensated by promoting interests in other attempts.

Possible limitations of laboratory experiments are compensated by the opportunity to **ensure causal interpretations** (fourth aim). So, it can be concluded that the relationship between control mode with helplessness and knowledge acquisition, already found in organisational field studies (Busch Meier, 1995; Scholl, 1996), really did reflect a causal impact of control mode.

4.2 Practical Conclusions

If power is exerted against the interests of the targets by experts in a project team or by leaders who are legitimised by their position (restrictive control) this behaviour does harm the actors themselves: They do not benefit from the knowledge of the targets because targets react with helplessness. Thus, it is recommended to influence others in agreement with their interests as often as possible. To use promotive control is especially important if the knowledge and active involvement of the targets is crucial. This is for example the case, if the problem to solve is new and complex and thus requires the expertise of several individuals (leaders as well as followers). Leaders should only use restrictive control if the ability of the team to come to a clear solution (action capability) is threatened under time pressure (for example because conflicts couldn't be resolved by other means) and if the leader has a clear competence lead.

5 References

- Abell, P. (1977). The many faces of power and liberty: Revealed preference, autonomy, and teleological explanations. *Sociology*, 11, 3-24.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology*, 51, 1173-1182.
- Blickle, G. (2003). Some outcomes of pressure, ingratiation, and rational persuasion used with peers in the workplace. *Journal of Applied Social Psychology*, 33, 648-665.
- Bodenhausen, G. V., Sheppard, L. A., & Kramer, G. P. (1994). Negative affect and social judgment: the differential impact of anger and sadness. *European Journal of Social Psychology*, 24, 45-62.
- Bohner, G., Hausschildt, A., & Knäuper, B. (1993). Einflüsse freudiger, trauriger und ärgerlicher Stimmung auf die Verarbeitung persuasiver Kommunikation. *Zeitschrift für Sozialpsychologie*, 24, 103-116.
- Buschmeier, U. (1995). *Macht und Einfluss in Organisationen*. Göttingen: Cuvillier Verlag.
- Campbell, D. T. (1974). Evolutionary epistemology. In P. A. Schilpp (Ed.), *The philosophy of Karl Popper* (pp. 413-463). La Sylle, Ill.: Opencourt.
- Cotton, J. L., Vollrath, D. A., Froggatt, K. L., Lengnick-Hall, M. L., & Jennings, K. R. (1988). Employee participation: Diverse forms and different outcomes. *Academy of Management Review*, 13, 8-22.
- De Dreu, C. K. W., & West, M. A. (2001). Minority dissent and team innovation: The importance of participation in decision making. *Journal of Applied Psychology*, 86, 1191-1201.
- Doucouliaos, C. (1995). Worker participation and productivity in labor-managed and participatory capitalist firms: A meta-analysis. *Industrial and Labor Relations Review*, 49, 58-77.
- Esser, J. K. (1998). Alive and well after 25 years: A review of groupthink research. *Organizational Behavior & Human Decision Processes*, 73, 116-141.
- Etzioni, A. (1968). *The active society. A theory of societal and political processes*. New York: Free Press.
- Falbe, C. M., & Yukl, G. (1992). Consequences for managers of using single influence tactics and combinations of tactics. *Academy of Management Journal*, 35, 638-652.
- French, J. R. P., & Raven, B. (1959). The bases of social power. In D. Cartwright (Ed.), *Studies in social power* (pp. 150-167). Ann Arbor, MI: Institute for Social Research.
- Higgins, C. A., Judge, T. A., & Ferris, G. R. (2003). Influence tactics and work outcomes: A meta-analysis. *Journal of Organizational Behavior*, 24, 89-106.
- Jäger, A. O., & Althoff, K. (1983). *Der WILDE-Intelligenz-Test (WIT)* (2nd revised ed.). Göttingen: Hogrefe.
- Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review*, 110, 265-284.
- Kersting, M. (1991). *Wissensdiagnostik beim Problemlösen. Entwicklung und erste Bewährungsprobe eines kontentvalide konstruierten problemspezifischen Wissenstests*. Unpublished diploma thesis, Freie Universität Berlin.
- Kersting, M. (1999). *Diagnostik und Personalauswahl mit computergestützten Problemlöseszenarien? Zur Kriteriumsvalidität von Problemlöseszenarien und Intelligenztests*. Göttingen: Hogrefe.
- Kersting, M., & Süß, H.-M. (1995). Kontentvalide Wissensdiagnostik und Problemlösen: Zur Entwicklung, testtheoretischen Begründung und empirischen Bewährung eines problemspezifischen Diagnoseverfahrens. *Zeitschrift für Pädagogische Psychologie*, 9, 83-93.

- Kipnis, D., & Schmidt, S. (1985). The language of persuasion. Hard, soft or rational: Our choice depends on power, expectations and what we hope to accomplish. *Psychology Today*, 4, 40-46.
- Kirkpatrick, S. A., & Locke, E. A. (1996). Direct and indirect effects of three core charismatic leadership components on performance and attitudes. *Journal of Applied Psychology*, 81, 36-51.
- Klocke, U. (2004). *Folgen von Machtausübung und Einflussnahme für Wissenszuwachs und Effektivität in Kleingruppen*. Unpublished doctoral thesis, Humboldt University of Berlin, Berlin.
- Klocke, U. (submitted 2004). Effects of power on justifications and transactive knowledge: Does the way in which power is used make a difference? *European Journal of Social Psychology*.
- Klotz, U. (1999, 26.7.). Neue Arbeitsplätze entstehen nicht durch mehr Verteilung: Neue ökonomische Spielregeln führen zu neuen Formen von Arbeit, Organisation und Politik. Die Folgen der "Informationsökonomie". *Frankfurter Allgemeine Zeitung*.
- Larson, J. R., Jr., Foster-Fishman, P. G., & Franz, T. M. (1998). Leadership style and the discussion of shared and unshared information in decision-making groups. *Personality & Social Psychology Bulletin*, 24, 482-495.
- Latané, B., Williams, K., & Harkins, S. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality & Social Psychology*, 37, 822-832.
- Maxwell, S. E. (1994). Optimal allocation of assessment time in randomized pretest-posttest design. *Psychological Bulletin*, 115, 142-152.
- Murphy, S. E., Blyth, D., & Fiedler, F. E. (1992). Cognitive resource theory and the utilization of the leader's and group members' technical competence. *Leadership Quarterly*, 3, 237-255.
- Pekrun, R., & Schiefele, U. (1996). Emotions- und motivationspsychologische Bedingungen der Lernleistung. In F. E. Weinert (Ed.), *Enzyklopädie der Psychologie, Themenbereich D Praxisgebiete, Serie I Pädagogische Psychologie, Band 2 Psychologie des Lernens und der Instruction* (pp. 153-180). Göttingen: Hogrefe.
- Plunkett, D. (1990). The creative organization: An empirical investigation of the importance of participation in decision-making. *Journal of Creative Behavior*, 24, 140-148.
- Raven, B. H., Schwarzwald, J., & Koslowsky, M. (1998). Conceptualizing and measuring a power/interaction model of interpersonal influence. *Journal of Applied Social Psychology*, 28, 307-332.
- Reichwald, R., & Möslein, K. (1999). Organisation: Strukturen und Gestaltung. In C. Graf Hoyos & D. Frey (Eds.), *Arbeits- und Organisationspsychologie* (pp. 29-49). Weinheim: Psychologie Verlags Union.
- Ronzheimer, I. (2004). *Kodierschema zur Erfassung des Prozesses des Wissenserwerbs und sozialer Verhaltensweisen in der Kommunikation*. Unpublished diploma thesis, Humboldt-Universität zu Berlin, Institut für Psychologie.
- Sagie, A. (1994). Participative decision making and performance: A moderator analysis. *Journal of Applied Behavioral Science*, 30, 227-246.
- Scholl, W. (1991a). Die mehrstufige Evolution des Wissens in sozialen Systemen. In D. Frey (Ed.), *Bericht über den 37. Kongreß der Deutschen Gesellschaft für Psychologie in Kiel 1990* (Vol. 2, pp. 629-632). Göttingen: Hogrefe.
- Scholl, W. (1991b). *Soziale Interaktion: Ein interdisziplinärer Bezugsrahmen* (20. Bericht aus dem Institut für Wirtschafts- und Sozialpsychologie). Göttingen: Georg-August-Universität.
- Scholl, W. (1996). Effective teamwork--A theoretical model and a test in the field. In E. H. Witte (Ed.), *Understanding group behavior - Small group processes and interpersonal relation* (Vol. 2, pp. 127-146). Mahwah, NJ: Lawrence Erlbaum Associates.
- Scholl, W. (1997). Gruppenarbeit: Die Kluft zwischen sozialpsychologischer Theoriebildung und organisationspsychologischer Anwendung. *Gruppendynamik*, 28, 381-403.

- Scholl, W. (1999). Restrictive control and information pathologies in organizations. *Journal of Social Issues*, 55, 101-118.
- Scully, J. A., Kirkpatrick, S. A., & Locke, E. A. (1995). Locus of knowledge as a determinant of the effects of participation on performance, affect, and perceptions. *Organizational Behavior and Human Decision Processes*, 61, 276-288.
- Seipp, B., & Schwarzer, C. (1991). Angst und Leistung - Eine Meta-Analyse empirischer Befunde. *Zeitschrift für Pädagogische Psychologie*, 5, 85-97.
- Süß, H.-M. (1991). Intelligenz und Wissen als Prädiktoren für Leistungen bei computersimulierten komplexen Problemen. *Diagnostica*, 37, 334-352.
- Süß, H.-M., & Faulhaber, J. (1990). *Berliner Version des Szenarios Schneiderwerkstatt (Computerprogramm)*. Berlin: Freie Universität, Fachbereich Erziehungs- und Unterrichtswissenschaften, FPS "Intelligenz und Wissen".
- Tabachnik, B. G., & Fidell, L. S. (1983). *Using multivariate statistics*. New York: Harper.
- Tabachnik, B. G., & Fidell, L. S. (1989). *Using multivariate statistics*. New York: Harper.
- Wagner, J. A. (1994). Participation's effects on performance and satisfaction: A reconsideration of research evidence. *Academy of Management Review*, 19, 312-330.
- Wagner, J. A., & Gooding, R. Z. (1987). Shared influence and organizational behavior: A meta-analysis of situational variables expected to moderate participation-outcome relationships. *Academy of Management Journal*, 30, 524-541.
- Wortman, C. B., & Brehm, J. W. (1975). Responses to uncontrollable outcomes: An integration of reactance theory and the learned helplessness model. In L. E. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 8, pp. 277-336). New York: Academic Press.
- Yukl, G., & Tracey, J. B. (1992). Consequences of influence tactics used with subordinates, peers, and the boss. *Journal of Applied Psychology*, 77, 525-535.
- Zillmann, D. (1994). Cognition-excitation interdependencies in the escalation of anger and angry aggression. In M. Potegal & J. F. Knutson (Eds.), *The dynamics of aggression: Biological and social processes in dyads and groups* (pp. 45-71). Hillsdale, NJ: Erlbaum.