

Generalized Self-Efficacy As a Mediator and Moderator Between Control and Complexity at Work and Personal Initiative: A Longitudinal Field Study in East Germany

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Personal initiative is one aspect of contextual performance. Combining the perspective of occupational socialization with the concept of self-efficacy, a general model is proposed and tested that views generalized work-related self-efficacy as an intervening variable in the relation between control and complexity at work and personal initiative. As part of a longitudinal study ($N = 463$ to 543) in East Germany, two different functions of self-efficacy as an intervening variable were examined: (a) self-efficacy as a mediator and (b) self-efficacy as a moderator. It was found that the relation between control and complexity and concurrent initiative is partly mediated by self-efficacy. In addition, self-efficacy functions as a moderator of the relation between control at work and retrospective initiative. Implications for the general discussion of self-efficacy and contextual performance are suggested.

Personal initiative is a behavior syndrome resulting in an individual's taking an active and self-starting approach to work and going beyond what is formally required in a given job. More specifically, personal initiative is characterized by the following aspects: (a) is consistent with the organization's mission, (b) has a long-term focus, (c) is goal oriented and action oriented, (d) is persistent in the face of barriers and setbacks, and (e) is self-starting and proactive (for a more detailed discussion of the concept, see Frese, Fay, Hilburger, Leng, & Tag, 1997; Frese, Kring, Soose, & Zempel, 1996). An individual with high personal initiative would,

for example, look into production problems and inform the supervisor of difficulties at work.

This concept is important because it has been shown to be related to the unemployed getting a job, need for achievement, action orientation, problem- (instead of emotion-) focused coping with stress, making career plans and executing them, and wanting to be and being self-employed (Frese et al., 1997).

This article closely examines the mechanisms involved in the development of personal initiative by combining the perspective of occupational socialization (Frese, 1982) with the concept of self-efficacy (Bandura, 1977, 1986). A general model that views generalized work-related self-efficacy as an intervening variable in this socialization process is proposed and tested. Our findings should lead to a better understanding of the determinants of personal initiative that in turn may serve as the basis for practical interventions to enhance personal initiative at work.

RELATION BETWEEN CONTEXTUAL PERFORMANCE AND PERSONAL INITIATIVE

Initiative is one instance of contextual performance. Taking Borman and Motowidlo's (1993) approach as a starting point, contextual performance and personal initiative can be said to have the following points in common: (a) they do not directly relate to the technical core, (b) they are common (and equally useful) to all jobs, (c) they relate to volition, and (d) they refer to extra-role activities. Thus, the smooth functioning of the organization (Organ, 1988) is supported by contextual performance and this concept should include initiative.

Extending contextual performance to include personal initiative leads to a better and more well-rounded concept because personal initiative is an important addition to those constructs that are traditionally discussed under the rubric of contextual performance, for example, organizational citizenship behavior (OCB; Organ, 1988) or organizational spontaneity (George & Brief, 1992). First, personal initiative emphasizes the proactive nature of contextual performance. Some of the operationalizations of OCB seem to emphasize the passive and conformistic side more strongly, particularly in the factor "conformity" (Eastman, 1994).

Second, measures of contextual performance (e.g., Motowidlo & van Scotter, 1994) take the tasks at work as given at this point. Personal initiative may actually change the task itself. It may sound like a paradox that contextual performance (which is not directed to doing the task) should change the task. However, this is actually the case for OCB as well because it may lead to task enrichment. But this point has not been emphasized up to now. Thus, task changes may be an outcome of contextual performance. However, initiative is necessary to achieve these task changes.

Third, much of contextual performance has relied on supervisors' judgments. Although this is an obvious advantage to approaches that rely on one-source information typical of much of questionnaire research, there are also disadvantages. These become particularly evident when considering research on initiative. Initiative threatens the status quo (by suggesting new ways of doing things) and may, therefore, be rejected by supervisors. This point is important when doing studies in Eastern Europe because supervisors tend to be authoritarian and to punish initiative there (Schultz-Gambard & Altschuh, 1993; cf. also Pearce, Branyicki, & Bukacsi, 1994). Thus, OCB may emphasize the short-term positive social lubrication at work, whereas personal initiative aims for the long-term survival of the organization.

Fourth, by investigating initiative, it is possible to relate issues of contextual performance to entrepreneurship or intrapreneurship and thus open up an additional corpus of empirical findings of high importance (Hisrich, 1990) for the study of contextual performance.

Finally, to our knowledge, there has been no study on self-efficacy and contextual performance although self-efficacy is plausibly related to contextual performance in general and initiative in particular.

THE CONCEPT OF GENERALIZED WORK-RELATED SELF-EFFICACY

Self-efficacy is defined as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Bandura suggests that self-efficacy has an important impact on human action and performance. It determines the initial decision to perform a behavior, the effort expended, and the persistence in the face of obstacles. Empirical studies have established a relation between self-efficacy and a wide range of human behaviors (e.g., Barling & Beattie, 1983; Stumpf, Brief, & Hartman, 1987; Taylor, Locke, Lee, & Gist, 1984). A recent meta-analysis (Sadri & Robertson, 1993) showed that self-efficacy is positively related both to performance and to choice of behavior in the context of organizational behavior.

Self-efficacy varies in generality (Bandura, 1986). As Bandura stated, "people may judge themselves efficacious only in certain domains of functioning or across a wide range of activities and situations" (Bandura, 1986, p. 396). Despite Bandura's emphasis on high specificity and high malleability of self-efficacy, we see self-efficacy within the wider concept of Rotter's (1966, 1975) generalized beliefs that Rotter used as a conceptualization of personality variables (cf. Eden & Kinnar, 1991). Two reasons speak for a conceptualization of generalized self-efficacy when predicting initiative. First, following Rotter's argument (1966, 1975), generalized expectations have an impact on behavior, especially in new and ambiguous situations. Because personal initiative implies that one acts in new and ambiguous situations, generalized expectations are of particular importance here. Second, it

follows from the perspective of occupational socialization that the effects of work conditions tend to generalize from the original situation (e.g., Kohn & Schooler, 1982). For example, if the work situation provides opportunities to work on challenging tasks, a person does not only learn that he or she can master these specific tasks, but, additionally, should develop a more general sense of mastery, that is, generalized self-efficacy.

Our study was concerned with personal initiative at work; therefore, self-efficacy was conceptualized as generalized work-related expectation. Thus, our concept is on a medium level of generality that is between a specific concept, for example, of asking whether or not one is able to do a certain task, and a highly generalized concept, for example, asking whether or not one has the capabilities to handle difficult job situations in general. Our concept of work-related generalized self-efficacy should correlate with highly generalized self-efficacy expectations. It should also be related to work-related self-esteem, because self-esteem is a general evaluation of one's own competencies to deal with work (Gist & Mitchell, 1992; Mohr, 1986).

Although there is a relation between the two constructs of self-efficacy and optimism, they should not be confused. Optimism refers to positive thinking, that is, the belief that one will generally experience good outcomes in life (Scheier & Carver, 1985). Thus, this concept does not presuppose that one has to be active to bring about the positive events. Self-efficacy, on the other hand, refers to the notion that one can bring about positive results through one's own actions. Because both optimism and self-efficacy (at least implicitly) refer to positive outcomes, there should be some relation between optimism and self-efficacy. But because the process by which this positive outcome is achieved is different, the correlation between measures of these two constructs should not be high.

SELF-EFFICACY AND PERSONAL INITIATIVE

Because personal initiative refers to complex actions that are difficult to maintain despite obstacles, it can be hypothesized that self-efficacy is important for personal initiative. This is so because self-efficacy helps to increase the probability of performing a difficult action and increases the effort and persistence to pursue this action. Conversely, low self-efficacy should impede personal initiative because low self-efficacious individuals tend to avoid challenging situations and to give up quickly in the face of obstacles.

CONTROL AND COMPLEXITY AT WORK AND SELF-EFFICACY

People in East Germany are often said to show less personal initiative and self-efficacy than people in West Germany. Frese, Kring, et al. (1996) found empirical

evidence for this hypothesis. Their findings suggest that this difference between East and West Germany is mainly due to occupational socialization effects, with control and complexity at work being important in this socialization process.

Bandura (1986) proposed that self-efficacy is developed throughout a person's learning history. He described four broad sources of information involved in the development of self-efficacy: enactive mastery, vicarious experience, verbal persuasion, and physiological arousal, with enactive mastery being the most important one. In the work context, enactive mastery can be experienced when one is able to make decisions, to work on challenging tasks, and to make use of one's competencies. Within the concept of occupational socialization (Frese, 1982), enactive mastery implies that there are work conditions that lead to the development of self-efficacy. The most important work conditions are control and complexity at work. Control implies that important decisions can be made by the incumbent. Complexity means performing challenging tasks (Frese, 1989). If control at work is low (nearly every step at work is prescribed), doing the task provides little information about one's personal effectiveness. Thus, there are few mastery experiences, and, consequently, few opportunities for developing self-efficacy. Complex tasks provide opportunities to apply individual skills and knowledge, thus also serving as a source of experiences relevant for self-efficacy. It follows that both control and complexity at work should have an impact on self-efficacy.

A GENERAL MODEL OF THE RELATION BETWEEN CONTROL AND COMPLEXITY AND PERSONAL INITIATIVE: SELF-EFFICACY AS AN INTERVENING VARIABLE

A general model that combines the expected relations between control and complexity, self-efficacy, and personal initiative at work is presented in Figure 1. Self-efficacy is conceptualized as an intervening variable in the relation between control and complexity as predictors and personal initiative at work as criterion. Mediator and moderator functions of an intervening variable may be differentiated (Frese, 1985; James & Brett, 1984).

The mediator function of self-efficacy links the work situation to personal initiative (see "a" in Figure 1). Such a relation implies that control and complexity have a direct effect on self-efficacy, and self-efficacy has a direct effect on personal initiative. Thus, control and complexity have an impact on personal initiative because they help to increase self-efficacy. They provide for mastery experiences and thus lead to a higher degree of generalized self-efficacy that, in turn, leads to higher personal initiative.

Longitudinally, two varieties of the mediator effect are plausible. First, control and complexity at work may have a concurrent effect on self-efficacy, and,

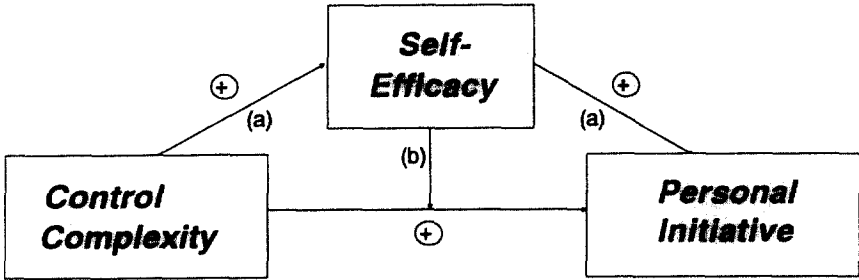


FIGURE 1 Hypothetical relations between control and complexity, self-efficacy, and personal initiative. This is a simplified model not including possible feedback loops. Note that the relations among the constructs may also be reciprocal over time.

subsequently, self-efficacy leads to changes in later personal initiative (*concurrent mediator model*). Second, the work conditions may need some time to develop their influence on self-efficacy later on, and self-efficacy, once it is increased, leads to more personal initiative concurrently (*lagged mediator model*). From the perspective of occupational socialization we prefer the *lagged mediator model*, supposing that control and complexity at work have to exist for some time to influence self-efficacy, and that self-efficacy, once it has been changed, is translated into action without much delay.

Additionally, self-efficacy may function as a moderator (see “b” in Figure 1). According to the moderator model the relation between work conditions and personal initiative should be a function of the level of self-efficacy. Individuals with high self-efficacy may compensate for a lack of control and complexity because they will assume to be able to influence things despite the lack of situational support. Thus, they will show personal initiative despite situational constraints. On the other hand, low self-efficacious people may give up quickly if the situation is not conducive to show initiative. However, they will show a high degree of initiative if the situation provides enough opportunities to make initiative easy. This moderator effect implies that control and complexity should have a stronger impact on personal initiative for people having low self-efficacy than for highly self-efficacious individuals.

Similar to the mediator effects discussed earlier, two models of a moderator effect are plausible: the concurrent moderator model with earlier self-efficacy functioning as moderator, and the lagged moderator model with later self-efficacy being the moderator. In contrast to the mediator hypothesis, the concurrent multiplicative effect of earlier control and complexity and earlier self-efficacy on later personal initiative is expected here because there should be a compensatory relations between concurrently appearing work conditions and self-efficacy.

A particular variable may function both as a mediator and as a moderator in the same model (James & Brett, 1984). The following analyses will determine whether and to what degree self-efficacy functions as mediator and/or moderator.

METHOD

Participants

The data reported in this article were part of a larger longitudinal study starting in July 1990 (other results on East–West differences were reported in Frese, Kring, et al., 1996, and on validity and reliability in Frese et al., 1997). A representative sample was drawn from Dresden, a large city in East Germany. It is the capital of Saxonia and, compared to other cities in East Germany, it is relatively wealthy. The selection of participants was done by randomly selecting streets, selecting every third house on a street, and within each house every fourth party (in smaller houses every third party was chosen). All people between the ages of 18 and 65 with full-time employment were asked to participate in a 1-hr interview and to fill out a questionnaire. The refusal rate of 33% was quite low for this type of study.

Because personal initiative was fully measured only in Waves 3 and 4, we concentrate on these two times. At t3 (August 1991), the sample consisted of 543 people and at t4 (September 1992) it consisted of 506 people. Experimental mortality was not found to change the characteristics of the sample substantially.¹ Only people who were employed at t3 were included because no measures of initiative in current work conditions were available for the unemployed. Thus, the sample analyzed here consisted of 363 persons. Forty-eight percent of the participants were women and 52% were men. The mean age of participants was 40.5 years ($SD = 11.3$ years).

Because of missing data, the sample size varies across the analyses. Pairwise deletion of cases was used in the correlational and regression analyses because it has been demonstrated to be the best procedure for handling missing data (Roth, Switzer, Campion, & Jones, 1994).

¹To compare the drop-outs from t1 to t4 with full participants, 16 two-tailed *t* tests for independent samples were computed for all the variables discussed in this article including the potential covariates. Because a multiple *t* test is a conservative test when used in this way, a Bonferroni-adjusted alpha of $.05/16 = .0031$ was used (Miller, 1966). No significant differences were found for the variables discussed in this article, except for optimism for better work, where the drop-outs reported a higher level of optimism.

Measures

The data were collected by either a standardized interview or a questionnaire. The interviews were carried out by trained interviewers. All of the interviewers' codings were re-rated by a second judge. The codings were culturally cross-checked, that is, interviewers from East Germany were re-raters of those interviews coded from Western interviewers and vice versa (for a detailed description of the interview procedures, cf. Frese et al., 1997). Means, standard deviations, reliabilities, and intercorrelations of all of the scales are reported in Table 1.

Work conditions. Control at work and complexity of work were measured with questionnaire scales developed by Semmer (1984; adaptation by Zapf, 1991; range from 1 to 7). *Control at work* consists of four Likert items measuring job discretion in the work place, for example "Can you decide on your own how to carry out your work?" *Complexity of work* is also composed of four Likert items referring to the difficulty of the work task, for example, "Do you get special tasks that are unusual and exceptionally difficult?" Semmer and Dunckel (1991) reported correlations of .50 and .54 respectively between measures provided by the participants and observations done by trained observers in a sample of factory workers.

Self-efficacy. Because our study is concerned with personal initiative at work, self-efficacy should be measured as a generalized work-related expectation. To our knowledge, no such scale has been developed before (cf. however, Saks, 1995). Therefore, a new six-item Likert scale was developed for this study (each with a range of 1 to 5, the scale divided by the number of items). In Table 2 the items and their item-total correlations are presented.² Cronbach's alphas were .68 (t3) and .67 (t4). Test-retest correlation was $r_{3/4} = .69$. Thus, work-related self-efficacy is a relatively stable construct.

The construct validity of the newly developed scale was assessed by correlating our measure of self-efficacy with related personality characteristics. We assumed that our measure of self-efficacy should be related to a highly generalized measure of self-efficacy, work-related self-esteem, control cognitions, and certain forms of optimism. These constructs were operationalized by using a measure of generalized self-efficacy that was not work-related (Schwarzer, Bäßler, Kwiatek, Schröder & Zhang, 1997), work-related self-esteem (Mohr, 1986), individual and collective control cognitions (Frese, 1986), general optimism (Scheier & Carver, 1985), and four measures of specific optimism that were developed for this study (optimism

²Compared to earlier versions of the self-efficacy scale, one item was replaced because of a certain overlap with personal initiative.

TABLE 1
Means, Standard Deviations, Reliabilities, and Intercorrelations for the Main Variables

Variable	M	SD	1	2	3	4	5	6	7	8
Control at work ₃	3.55	0.82	(.77)							
Complexity of work ₃	3.44	0.76	.46**	(.66)						
Self-efficacy ₃	3.46	0.51	.22**	.14**	(.68)					
Self-efficacy ₄	3.49	0.49	.20**	.19**	.69**	(.67)				
Initiative-Retro ₃ ^a	0.12	1.66	.23**	.28**	.09*	.14**	(.78)			
Initiative-Retro ₄ ^a	-0.02	1.66	.25**	.25**	.06	.14**	.49**	(.84)		
Initiative-Conc ₃ ^a	0.17	3.07	.21**	.30**	.14**	.14**	.47**	.38**	(.79) ^b	
Initiative-Conc ₄ ^a	0.26	2.90	.29**	.31**	.18**	.18**	.46**	.49**	.56**	(.74) ^b

Note. $n = 312$ to 363 ; variation is due to missing data. Values in parentheses are reliability coefficients for the full sample (Cronbach's Alpha). Means, standard deviations, and correlations were calculated for the subsample analyzed in this article. Retro = retrospective; Conc = concurrent.

^aSum of z scores. ^bCronbach's Alpha based on scales.

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

TABLE 2
Means, Standard Deviations, and Item-Total Correlations of the
Work-Related Self-Efficacy Scale (t3)

Item	M	SD	R _{it-i}
When I am confronted with a new task, I am often afraid of not being able to handle it. ^a	3.61	.83	.37
I judge my abilities to be high.	3.27	.71	.44
If I want to achieve something, I can overcome setbacks without giving up my goal.	3.63	.82	.49
When I want to reach a goal, I am usually able to succeed.	3.68	.70	.46
In case of becoming unemployed, I am convinced that, because of my abilities, I will soon find a new job.	3.07	1.05	.38
If I had to change my job, I am sure I would be up to the demands.	3.40	.81	.40

^aItem inverted.

for better work, for minimizing the effects of unemployment, for better economies, for more leisure time).

Table 3 shows that our theoretical expectations were met. Work-related self-efficacy correlated positively with a non-work oriented measure of generalized self-efficacy, self-esteem, individual and collective control cognitions, and general optimism. For the different measures of specific optimism, correlations with self-efficacy were stronger when the measure of optimism was related to the work situation. Thus, our measure is of medium generality—more specific than generalized self-efficacy (Schwarzer et al., 1997), but also generalized with regard to various work situations.

In summary, correlations with other constructs provide evidence for construct validity of the work-related self-efficacy scale. Additionally, the correlations were not overly high, indicating that the instrument measures a construct distinct from the other personality measures.

Personal initiative. Personal initiative was operationalized as described by Frese, Kring, et al. (1996; Frese et al., 1997) with a combination of several indicators developed from interview material. Two broad factors were built by summing up the z scores of the indicators.

The first factor, retrospective initiative, covers two aspects of retrospectively reported initiative at work. It consists of two scales, initiative at work and initiative with regard to colleagues. Memory factors are more important here than in the second factor.

TABLE 3
Correlations of Work-Related Self-Efficacy With
Other Constructs (All t3)

<i>Variable</i>	<i>Work-Related Self-Efficacy</i>
Non-work generalized self-efficacy ^a	.53*
Work-related self-esteem	.52*
Control cognitions	
Individual	.28*
Collective	.22*
Optimism	
Optimism general	.38*
Optimism better work	.23*
Optimism unemployment	.35*
Optimism leisure time	.02

^aThis correlation refers to another measurement wave because generalized self-efficacy was not measured at t3 and t4.

* $p < .01$.

Initiative at work was measured by asking the participants about four different activities at work during the last year, for example, whether they had provided a suggestion that led to an improvement in the work process. If the answer was positive, the interviewer probed for what kind of suggestion it was, whether it was the participant's own idea, how often it was done, whether people in that kind of job would typically do these things, and so forth. After the session, the interviewer judged whether the participant's behavior constituted something that went beyond the duties of the job and rated the amount of initiative demonstrated on a 5-point scale. The interrater correlation was $r = .84$ (t3).

In addition to the work-related questions, three questions were asked about initiative with regard to colleagues, for example, whether or not the participant had been active in defending a colleague's rights. These questions were treated in the same way as initiative at work. The interrater correlation was $r = .79$, (t3).

The second factor, concurrent initiative, consists of four scales and is concerned mainly with initiative shown in the context of the interview. Education initiative is an index built from five interview ratings, for example, whether the participant intends to participate in some continuing education in the future. The interrater agreement was $r = .88$ (t3).

Interviewer evaluation consists of 11 Likert items asking the interviewers for their subjective impression of how proactive the participants were (no re-rating was done here because it was based on a subjective impression).

Overcoming barriers measured the tenacity and creativity in solving problems. It was inspired by the situational interview (Latham & Saari, 1984). The interviewer presented four problems; for example, what the participant would do if he or she

was fired from a job. After the participants' response the interviewer told the participant that this strategy would not work and asked the participant to think of additional strategies (three times). Thus, each time the interviewer suggested that the strategy was not good enough yet, it was measured how many barriers the participant was able to overcome. The interrater agreement was $r = .80$ (t_3).

Active approach measured the way the participants approached the barriers in the situational interview. If they were delegating the solutions to someone else (e.g., the supervisor), this was seen as less active than when they were trying to actively solve the problem themselves (interviewer's rating, no interrater reliability computed).

RESULTS

Self-Efficacy as a Mediator

According to the mediator model the following relations between control and complexity, self-efficacy, and personal initiative were expected: positive correlations between control and complexity and self-efficacy, between self-efficacy and personal initiative, and between control and complexity and personal initiative. Additionally, the correlation between control and complexity and personal initiative should be reduced when the mediator self-efficacy is held constant with a partial correlation procedure.

The bivariate relations between the three sets of variables were mainly in the expected direction (see Table 1). Self-efficacy correlated moderately positive with control at work and complexity of work (r_s between .14 and .22, all $p_s < .01$). Control and complexity correlated significantly with personal initiative (r_s between .21 and .31). Self-efficacy correlated significantly with personal initiative (r_s between .09 and .18), except for the correlation of self-efficacy_B with retrospective initiative_A, that did not reach significance.

These significant bivariate relations reported so far are necessary, but not sufficient, conditions for the validity of the mediator model. Hierarchical regression analyses (Cohen & Cohen, 1975) were used to examine whether the relation between control and complexity and personal initiative was actually mediated by self-efficacy (cf. Tables 4 and 5). In these analyses, prior initiative values (t_3) were always entered in the first block together with age, sex, and qualification as potential confounding variables, so that changes in personal initiative were analyzed. This procedure generally leads to small relationships, because prior change in personal initiative is also partialled out.

The following regression analyses were computed. First, the nonmediator model was tested by regressing personal initiative (t_4) on control and complexity (t_3) to verify which amount of variance in the change of personal initiative is explained by the work conditions (Analysis 1). Second, personal initiative (t_4) was regressed

TABLE 4
 Mediator Model: Multiple Regression of Concurrent Initiative on
 Control and Complexity and Self-Efficacy

Predictor	R^2	R^2_{inc}	R^2_{diff}	R^2_{red}	B
Nonmediator model					
Step 1	.41***	.41***			
Initiative-Conc ₃					.31***
Initiative-Retro ₃					.46***
Qualification ₃					.76***
Sex					.44*
Age					-.03**
Step 2	.43***	.02**			
Control ₃					.34*
Complexity ₃					.24
Concurrent mediator model ^a					
Step 2	.42***	.01***			
Self-efficacy ₃					.68***
Step 3	.44***	.01***	.01	50%	
Control ₃					.26
Complexity ₃					.24
Lagged mediator model ^a					
Step 2	.42***	.01**			
Self-efficacy _{t4}					.62**
Step 3	.43**	.01**	.01	50%	
Control ₃					.30
Complexity ₃					.22

Note. Retro = retrospective; Conc = concurrent.

^aStep 1 is identical for all three models.

* $p < .10$. ** $p < .05$. *** $p < .01$.

on self-efficacy (t3) and control and complexity (t3), entering self-efficacy in the second and control and complexity in the third block (Analysis 2: concurrent mediator model). This computes the amount of variance in the change of personal initiative being accounted for by the work conditions after controlling for the effects of self-efficacy (t3). Third, the lagged mediator model was tested in a similar way by regressing change in personal initiative on self-efficacy (t4) and control and complexity (t3), again entering self-efficacy in the second and control and complexity in the third step (Analysis 3). In each case, the R^2 difference between mediator model and the nonmediator model is displayed in the third column in Table 4 and Table 5 (the percentage of the R^2 reduction is shown in the fourth column).

For concurrent initiative (see Table 4), regressing changes in personal initiative on control and complexity resulted in $R^2_{inc} = .02$ ($p < .01$) for the nonmediator model

TABLE 5
 Mediator Model: Multiple Regression of Retrospective Initiative on
 Control and Complexity and Self-Efficacy

Predictor	R^2	R^2_{inc}	R^2_{diff}	R^2_{red}	B
Nonmediator model					
Step 1	.29***	.29***			
Initiative-Retro ₃					.41***
Initiative-Conc ₃					.05
Qualification ₃					.36***
Sex					.07
Age					-.01
Step 2	.30***	.01			
Control ₃					.20*
Complexity ₃					.03
Concurrent mediator model ^a					
Step 2	.29***	.00			
Self-efficacy ₃					.00
Step 3	.30***	.01	.00	0%	
Control ₃					.21*
Complexity ₃					.03
Lagged mediator model ^a					
Step 2	.29***	.00			
Self-efficacy ₄					.18
Step 3	.30**	.01	.00	0%	
Control ₃					.20*
Complexity ₃					.02

Note. Retro = retrospective; Conc = concurrent.

^aStep 1 is identical for all three models.

* $p < .10$. ** $p < .05$. *** $p < .01$.

(Analysis 1). Thus, the work conditions predicted changes in initiative—a confirmation of the occupational socialization perspective. Entering self-efficacy (t3) in the second block (Analysis 2: concurrent mediator model) resulted in $R^2_{inc} = .01$ ($p < .01$), indicating that self-efficacy, too, significantly predicted changes in initiative. The amount of variance accounted for by control and complexity was reduced to $R^2_{inc} = .01$ ($p < .05$), indicating that 50% of the common variance of control and complexity and the change in concurrent initiative was mediated by self-efficacy (t3). The same pattern was observed for the lagged mediator model. Thus, for concurrent initiative, both mediator models were supported by our data. Control and complexity were shown to have both direct and indirect effects on concurrent initiative.

In contrast to concurrent initiative, neither control and complexity nor self-efficacy significantly predicted changes in retrospective initiative (see Table 5). Thus,

both the occupational socialization perspective and the mediator model were not supported for retrospective initiative.

Self-Efficacy as a Moderator

The moderator hypotheses were tested by moderated regression analyses (Stone & Hollenbeck, 1984; Zedeck, 1971). Separate moderator analyses were performed for the two criterion variables, concurrent and retrospective initiative, and for the concurrent and lagged moderator model. In the first step, personal initiative (t_3), the covariates, and all main effects, that is, control at work, complexity of work, and self-efficacy (t_3 and t_4), were entered into the equation. In the second step, all interaction terms were entered into the equation. Because moderator effects are difficult to detect in field studies (McClelland & Judd, 1993), and because we

TABLE 6
Moderator Model: Hierarchical Regression Analysis on Retrospective Initiative (t_4)

Predictor	R^2	R^2_{inc}	B
Step 1: Main effects ^a	.30***	.30***	
Step 2: Concurrent moderator model	.31***	.01	
Control at Work _{t3} × Self-efficacy _{t3}			-.43*
Complexity of Work _{t3} × Self-efficacy _{t3}			.20
Step 2: Lagged moderator model	.32***	.02**	
Control at Work _{t3} × Self-efficacy _{t4}			-.57**
Complexity of Work _{t3} × Self-efficacy _{t4}			-.04

^aMain effects were initiative_{t3}, qualification_{t3}, sex, age, control at work_{t3}, complexity of work_{t3}, self-efficacy_{t3}, and self-efficacy_{t4}.

* $p < .10$. ** $p < .05$. *** $p < .01$.

TABLE 7
Moderator Model: Hierarchical Regression Analysis on Concurrent Initiative (t_4)

Predictor	R^2	R^2_{inc}	B
Step 1: Main effects ^a	.44*	.44*	
Step 2: Concurrent moderator model	.44*	.01	
Control at Work _{t3} × Self-efficacy _{t3}			.67
Complexity of Work _{t3} × Self-efficacy _{t3}			-.09
Step 2: Lagged moderator model	.44*	.00	
Control at Work _{t3} × Self-efficacy _{t4}			-.07
Complexity of Work _{t3} × Self-efficacy _{t4}			-.40

^aMain effects were initiative_{t3}, qualification_{t3}, sex, age, control at work_{t3}, complexity of work_{t3}, self-efficacy_{t3}, and self-efficacy_{t4}.

* $p < .01$.

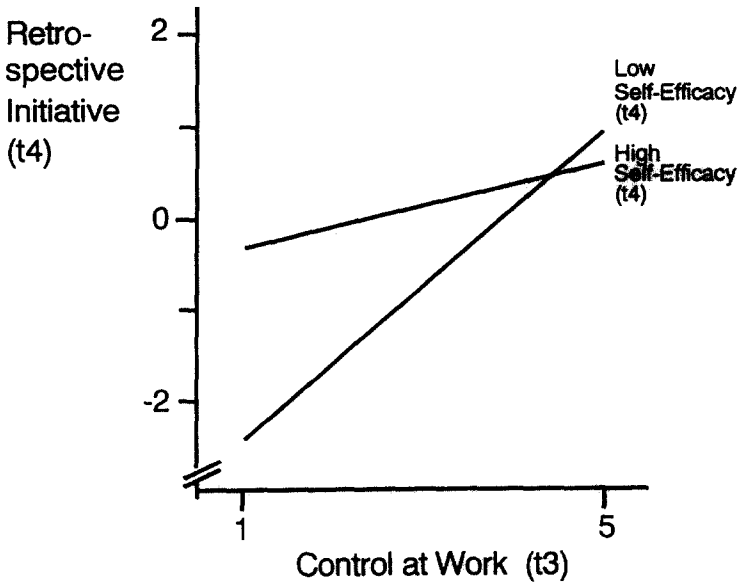


FIGURE 2 Lagged moderator effect of self-efficacy on the relation between control at work and retrospective initiative.

wanted to avoid a Type II error due to lack of power, we also calculated the significance level of .10 (as was done, e.g., by LaRocco, House, & French, 1980).

The results of the regression analyses are presented in Table 6 and Table 7. For retrospective initiative (see Table 6), all main effects entered in the first step accounted for 30% of the variance in the criterion. This step was identical for both the concurrent and the lagged moderator model. Entering the interaction terms did not lead to a significant increase of criterion variance for the concurrent moderator model, but for the lagged moderator model an additional 2% of the variance in retrospective initiative was explained, with Control at Work \times Self-Efficacy_{t4} showing a significant negative regression coefficient ($B = -.57, p < .01$). This negative B indicates that high self-efficacy decreased the relation between retrospective initiative and control at work.

Figure 2 depicts the moderator effect of self-efficacy and control at work by showing two regression lines for the regression of retrospective initiative (t4) on control at work (t3), one for the high and one for the low self-efficacy subgroups.³ As expected, the relation between control at work and retrospective initiative was stronger for people with low self-efficacy than for those with high self-efficacy.

³The high and low subsamples contained all participants with self-efficacy scores at least 1 standard deviation above and below the mean.

Although the low self-efficacious individuals reported as much initiative as the high self-efficacious individuals under work conditions providing high control, there was a clear-cut difference under low control conditions. Here, the low self-efficacious revealed only a small amount of retrospective initiative compared to the high self-efficacious.

The results for concurrent initiative are presented in Table 7. Here, the main effects accounted for 44% of the variance in concurrent initiative. Entering the interaction terms did not lead to a significant increase in the criterion for both the concurrent and the lagged moderator model. Thus, the moderator model was not supported for concurrent initiative.

DISCUSSION

This study has looked at one issue of contextual performance, initiative, and has attempted to combine the perspective of occupational socialization (Frese, 1982) with Bandura's (1977, 1986) concept of self-efficacy. Both the mediator and moderator functions were partly supported in this study.

The results confirm the mediating effect of self-efficacy in the relation between control and complexity at work and concurrent initiative. Half of the common variance of control and complexity and later concurrent initiative was found to be mediated by self-efficacy. Thus, control and complexity have their effect on concurrent initiative partly via self-efficacy. The longitudinal design of the study and keeping the stability of initiative constant allows the interpretation that the mediator affects changes in personal initiative.

One can differentiate between a full and a partial mediation model (James & Brett, 1984). A full model would imply that there is no other variable mediating between the work conditions and initiative. Such a full mediation model was not supported by our data. The model supported here can be best described as partial mediation, that is, only a part of the total effect of control and complexity on concurrent initiative is due to mediation by self-efficacy. This is not surprising, because control and complexity are thought to have a direct activating effect as well (e.g., Karasek & Theorell, 1990). In addition, other variables may function as mediators in the relation between control and complexity and personal initiative, for example, control cognitions (Frese, 1986), readiness to change at work (Frese & Plüddemann, 1993), and control rejection (Frese, Erbe-Heinbokel, Grefe, Rybowskiak, & Weike, 1994).

Our results are in line with other studies. Self-efficacy has also been shown to be of high importance in another study on one instance of initiative—namely submitting suggestions to the company to improve efficiency and working conditions (Frese, Teng, & Wijnen, 1996). This study looked at blue collar workers in a Dutch company and thus provides a reinforcement of these results in another culture and within a different setting.

Self-efficacy was also found to moderate the relation between control at work and the development of retrospective initiative. As expected, there was a stronger impact of control at work on initiative in people with low self-efficacy than in those with high self-efficacy for retrospective initiative. This implies that highly self-efficacious individuals are less dependent on the external work conditions than the low self-efficacious in the development of retrospective initiative. Their high self-efficacy shields them from the impact of low control at work. This corresponds with the experimental findings by Jerusalem and Schwarzer (1992), who showed that high self-efficacious individuals were less affected by stressful situations than individuals with low self-efficacy. In terms of personality effects at work, personality (self-efficacy) plays a role mainly in the low control condition. In terms of work conditions, control is important mainly in people with low self-efficacy (cf. Adler, 1994). Saks (1995) also put self-efficacy within the context of an occupational socialization perspective with adjustment as the dependent variable. This study provided only limited support for a mediation hypothesis. However, there were moderator effects of self-efficacy and training. They also support a compensation effect. People with low self-efficacy profit more from training than people with high self-efficacy.

Our data have implications for the general discussion of self-efficacy. For example, Gist and Mitchell (1992) argued that there is a direct concurrent effect of work conditions on self-efficacy judgments. Although we do not generally disagree with their approach, our results only partly support their hypothesis: Both concurrent and lagged mediator models are supported by the data presented here.

For contextual performance, the following conclusions are important. First, one aspect of contextual performance—personal initiative—was researched that emphasizes the active nature of dealing with work life. Second, the notion of occupational socialization should be emphasized more strongly in contextual performance. Although George and Brief (1992) suggested that we look at direct precursors (e.g., positive mood) of helping behavior, it may pay to look at the long-term development of contextual performance at work as well. Control and complexity are important starting points. Other aspects of socialization come readily to mind, for example, mentor systems, socialization practices that reduce the self-confidence of the newcomers, and so forth (cf. van Maanen & Schein, 1979). Third, we suggest that self-efficacy may well be important for other areas of contextual performance as well. If a person does not think that he or she can actually do well in helping others, he or she will probably not do it. Fourth, our contribution has been to look at an interesting sample and to look at it from a longitudinal perspective. Finally, we think that personality factors are probably good predictors of initiative, as they are for contextual performance in general (Borman & Motowidlo, 1993). However, we assume that different personality dimensions will predict initiative than OCB. For example, we have shown that initiative does not correlate highly with job satisfaction (Frese et al., 1997), although it does correlate highly with OCB (Organ, 1988).

A number of methodological issues of the study need to be discussed. First, one initiative variable—retrospective initiative—required participants to recall past behavior. Although care was taken by the interviewers to distinguish fact from fiction, this variable has to be interpreted more cautiously than concurrent initiative. Memory effects have been shown to be important in retrospective reports (Neisser, 1982).

Our measure of work-related self-efficacy should be improved. Although its reliability is higher than .60 and, therefore, adequate for early stages of research (Nunnally, 1978), its reliability is at the lower end for practical purposes.

It might be argued that the effects reported here are quite small. However, for several reasons we think that they should be taken seriously. First, we have used conservative methodologies like moderated regression analyses and partialling out the stabilities of the dependent variables and possible covariates. Partialling out the stabilities and covariates decreases the amount of variance that can be explained by the predictors. Moreover, the potential impact of earlier self-efficacy on initiative at t_3 is also removed by this approach. Second, there is no common method variance between the predictor variables and the criterion because the predictors have been measured with questionnaires and the initiative variables with standardized interviews. Thus, all the effects reported here are probably at the lower boundary of the actual relations. Finally, it has been shown by several authors that even small correlations can be of high practical relevance (e.g., Abelson, 1985; Frese, 1985).

There may be some practical implications of the results of our study. A starting point for interventions may be to increase personal initiative by making control and complexity available in the work situation (e.g., Hackman & Oldham, 1980). A second issue is to train self-efficacy to increase personal initiative. Because self-efficacy changes are mainly based on enactive mastery (Bandura, 1986), training should provide those experiences.

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