Training and motivation: The function of implementation intentions, goal orientation and errors for performance
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Summary and Conclusions

The studies presented in this book analyzed different aspects related to training and motivation that are all related to action theory (Frese & Zapf, 1994; Hacker, 1985, 1986). We tested a motivational theory on goal setting and goal striving from basic research in an applied setting using a longitudinal approach (Chapter 2). A questionnaire survey of a cross-cultural sample with participants from the Netherlands and Germany was conducted to add conceptual issues to goal orientation, a motivational concept that has become increasingly relevant in recent research (Chapter 3). In an experimental study, the role of errors / feedback and three different training designs were analyzed with regard to performance. Goal orientation was included in this experiment as an antecedent of training behavior and learning, as well as a training outcome (Chapter 4).

The action phases model

The longitudinal study revealed that the action phases model – originating from basic research developed by Gollwitzer (1990) and Heckhausen (1989, 1991) – could be successfully transferred into an everyday setting. From an applied point of view, we wanted to know whether people who considered continuing their education were more successful in realizing this goal when they adhered to the steps that the action phases model assumes to lead to goal achievement. These steps include first to evaluate the intention as desirable and feasible before - in the second step - the intention becomes a real goal one feels committed to (goal intention). The next step on the way from wishes to action involves planning behavior – forming an implementation intention, that is committing oneself to some specified circumstances under which the intended action should be started and executed. Implementation intentions specify the when, where and how to act. Goal achievement has been shown to benefit from these implementation intentions, as studies in the laboratory or with regard to relatively simple personal goals.
have shown (Gollwitzer, 1993; Gollwitzer & Brandstätter, 1997; Gollwitzer & Schaal, 1998). Our longitudinal approach allowed us to investigate a complex goal and to include the actual behavior with regard to this goal within a timeframe of two years. Our results supported the positive function of goal intentions and implementation intentions in realizing a complex goal such as continuing one’s education. The willful decision for a certain goal (goal intentions) and having thought about and committed oneself to the when, where and how to act (implementation intentions) increased the degree of goal realization. It was also shown that a solid motivational basis for an endeavor, in terms of high desirability and feasibility, is a necessary condition for successful goal realization and for the benefits of goal and implementation intentions. In addition, we observed the expected change in participants’ cognitive functioning according to the phase they were involved in. Participants shifted from a deliberative mind-set to an implemental mind-set after they had formed a goal intention.

One can conclude from the study that the action phases model is a useful theoretical framework that can be applied to practical issues. It shows us potential starting-points for interventions that should facilitate successful goal achievement: first, there should be an appropriate information policy on training programs and further education that demonstrate the attractiveness of these offers. Detailed information should be provided on the demands and necessary prerequisites for successful participation. Interested individuals can then weigh the pros and cons and evaluate the feasibility of training offer appropriately. Second, support should be provided for decision-making and further planning. This includes the design of training programs that focus on self-regulatory skills and planning in terms of when, where and how to realize the first steps toward the intended goal.

In our study we did not record the type of external barriers and hurdles participants were confronted with on their way from considering further education to practically realizing it. External barriers could have been, for example, lack of time, money or any other resource necessary for participation, no training programs available at the time of interest, or other aspects of a program which hinder people from
considering the program as desirable and feasible. Future research should include measurement of external factors which might influence goal setting and goal striving above and in combination with goal intentions and implementation intentions.

**Goal orientation**

The second study in this book compared two instruments measuring trait goal orientation (Button, Mathieu, & Zajac, 1996 and Vandewalle, 1997) with regard to its dimensionality and tested their relationship with achievement motivation, fear of failure and hope for success. Goal orientation is a motivational concept which structures the way individuals perceive learning and achievement situations. A cross-cultural setting was used for this questionnaire survey of 370 students from the Netherlands and Germany. Up to this point goal orientation has been conceptualized as either consisting of a learning and a performance goal dimension or including an additional third factor which measures avoidance goal orientation. A LISREL confirmatory factor analysis approach was used and provided for both samples the best model fit for a three-factor solution with correlating factors. Thus, one can empirically differentiate between these three factors. This result indicates that goal orientation should include a learning, a performance (or prove) and an avoidance goal dimension. Individuals with a learning goal orientation focus on developing their ability and learning skills, making challenging tasks attractive to them. Individuals with performance goals strive for positive judgements by others and want to demonstrate good performance. These individuals interpret new and difficult tasks as threatening rather than challenging. Avoidance goal oriented individuals focus on avoiding disapproval and negative judgements of their ability. Therefore they are very likely to avoid those tasks where failure might occur.

Beside the issue of dimensionality, we wanted to find out what the new scale adds that is not yet covered by other related concepts. Therefore, we analyzed the relationships between the three different aspects of goal orientation with need for achievement, fear of failure and hope for success. Although the concepts were related to each other, the correlations were not so high as to warrant the interpretation that they
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were the same concept. We found that need for achievement, with its high performance standards, went along with a desire to learn something new, to develop one's ability (learning goal orientation) and to show good performance (prove goal orientation). However, need for achievement did not predict an avoidance tendency in goal orientation. The pessimistic expectancy to fail in reaching high performance standards (fear of failure) was related to a person's reduced desire to deal with new and challenging tasks (learning goal orientation). Fear of failure and avoidance goal orientation cover similar tendencies to expect not to reach a performance standard and lead, therefore, to an avoidance of potential failure situations. Prove goal orientation showed no substantial relationship with fear of failure. With hope for success we found the expected relationships in two out of three aspects of goal orientation: an optimistic expectancy to reach high performance standards went along with the desire to learn something new and to improve one's ability (learning goal orientation). Avoiding a specific task or situation in case of anticipated failure (avoidance goal orientation) has been shown to be opposite of an optimistic achievement expectation. The findings with regard to the relationships between hope for success and prove goal orientation were less consistent and do not allow for conclusive interpretation.

One can conclude from these findings that goal orientation is best represented by a three-dimensional concept measuring motivational orientation including learning, prove and avoidance goals. These different aspects of goal orientation overlap only to a moderate degree with achievement motivation and suggest therefore the existence of two distinct concepts.

Goal orientation has been originally conceptualized as a motivational orientation that is relatively stable in different situations. It therefore has an influence on goal setting processes in different situations (as described in the action phases model and the action theory). Our study has shown that three different goal orientations can be differentiated. With regard to the content of the three aspects of goal orientations, one can imagine that rather different actions and behavior patterns are promoted by these different orientations. Learning goals lead people to contrasting actions than do
avoidance goals. Therefore, trouble-free action processing is only guaranteed if there is only one main goal which dominates all other goals. If this is not the case contrasting goals compete against each other. Integrating knowledge from the action phases model and goal orientation results in the conclusion that deciding for a learning or a prove or an avoidance goal stops the competition between contrasting goals and produces or preserves the ability to act.

**Error training and goal orientation**

The experimental study described in Chapter 4 refers to the design of training as an important characteristic which influences learning and transfer performance (Baldwin & Ford, 1988; Goldstein, 1992). The three different training conditions compared in this experiment differed in terms of how they dealt with errors and feedback. The method of error training and the role of the so-called error heuristics are the center of attention in this experiment. Motivation appeared in this learning context as participants’ goal orientation, both as antecedent of training behavior (trait goal orientation) and as a consequence of the experiences during training (state goal orientation). Consequently, we used a process-oriented approach towards training effectiveness and transfer performance.

Error training is based on the concept of error management (Frese, 1991, 1995) and implies that one perceives errors as potentially useful for learning. Further, error training provides trainees with the so-called error heuristics and only minimal information about the program to be taught during the training. Error heuristics were in this case statements which emphasized the positive meaning of errors and their potential for learning. Participants in the two other groups received either the same error training but were not provided with the heuristics or received an error avoidance training which did not allow them to make any errors. This latter group were trained with detailed written instruction which guided them errorless through the tasks.
The results revealed that participants trained under error training with heuristics learned the most and therefore showed the best performance results, both from a short- and long-term perspective. The error heuristics were crucial for this performance superiority. In addition, error training with heuristics produced more spontaneous transfer performance than any other training condition did.

Since one aspect of goal orientation deals with failure and errors, we assumed that goal orientation would be influenced specifically through different training conditions because the errors were framed differently specifically between these training conditions. Surprisingly, this was not the case here. Due to training in general, participants' prove and avoidance goal orientation decreased, whereas their learning goal orientation stayed the same on a fairly high level. Another unexpected result was that goal orientation did not influence trainees' performance either directly or in interaction with a specific training method.

These findings indicate that error training is a very effective training method. Several training outcomes such as immediate training performance, spontaneous transfer and long-term transfer performance are positively influenced. Thus, there is promising evidence for the superiority of error training compared to other methods. The underlying mechanism for this superiority however, is not the specific influence of goal orientation but rather the self-regulatory effect of the error heuristics. One could conclude that the error heuristics prevent participants from focusing on self-related meta-tasks (cf., Kanfer & Ackerman, 1989) when confronted with errors and that their attention is directed towards the task and not to the self (cf., Kluger & DeNisi, 1996) or to task-irrelevant cognitions (cf., Sonnentag, 1998).

Given the performance superiority of the error training method one can recommend to design a training according to the guidelines of error training. A relatively easy solution would be to add the heuristics to training programs that already exist. Error heuristics might develop their self-regulatory function even in the context of traditional step-by-step, error-avoiding training programs.
Conclusion

Integrating the results with regard to the beneficial effects of implementation intentions on goal realization (Chapter 2) and the important influence of error heuristics for training effectiveness (Chapter 4), one could come to the following conclusion: Error heuristics function in a similar way as implementation intentions do. They specify how one should feel or think or behave when an error occurs. Thus, they specify the circumstances under which an action should be executed. Error heuristics ‘prescribe’ focusing on the learning opportunity provided by the error information in the face of failure. They ‘prescribe’ to not be upset but rather learning oriented and to look for solution. Both aspects, implementation intention and error heuristics, increase self-regulatory capacity. As our studies showed, effective self-regulation is of major importance for successful goal realization and for learning.

Generally one should also keep in mind that one might come to a controversial evaluation of different goal orientations when transferring this concept from a training context into work behavior and organizational goals. Do organizations really focus on learning oriented subordinates? Don’t they also ask for those individuals who just do their job properly and without any mistakes? A subtly differentiated perspective towards the functionality of goal orientation for different tasks and context is needed. This does not only include distinguishing between a training context and a job context, but also distinguishing between different levels of task complexity, responsibility and content of the task.
The results revealed that participants trained under certain instructions showed improved performance in a task designed to test their cognitive flexibility. This was especially evident in conditions where participants were required to switch between different tasks rapidly. The findings suggest that strategies aimed at enhancing cognitive flexibility could be beneficial in various educational and professional settings. Further research is needed to explore the long-term effects of such training programs.