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Chapter 2

Effective self-regulation of goal attainment

Gabriele Oettingen[a,*], Gaby Hönig[b], Peter M. Gollwitzer[c,d]

[a]*Psychology Department, New York University, 6 Washington Place 7th Floor, New York, NY 10003, USA*
[b]*Free University, Berlin, Germany*
[c]*Universität Konstanz, Germany*
[d]*New York University, New York, USA*

Abstract

Self-regulatory strategies of goal setting and goal striving are analyzed in three experiments. Experiment 1 uses fantasy realization theory (Oettingen, in: J. Brandstätter, R.M. Lerner (Eds.), *Action and Self Development*: *Theory and Research through the Life Span*, Sage Publications Inc, Thousand Oaks, CA, 1999, pp. 315–342) to analyze the self-regulatory processes of turning free fantasies about a desired future into binding goals. School children 8–12 years of age who had to mentally elaborate a desired academic future as well as present reality standing in its way, formed stronger goal commitments than participants solely indulging in the desired future or merely dwelling on present reality (Experiment 1). Effective implementation of set goals is addressed in the second and third experiments (Gollwitzer, *Am. Psychol.* 54 (1999) 493–503). Adolescents who had to furnish a set educational goal with relevant implementation intentions (specifying where, when, and how they would start goal pursuit) were comparatively more successful in meeting the goal (Experiment 2). Linking anticipated situations with goal-directed behaviors (i.e., if–then plans) rather than the mere thinking about good opportunities to act makes implementation intentions facilitate action initiation (Experiment 3).

Successful goal attainment demands completing two different tasks. People have to first turn their desires into binding goals, and second they have to attain the set goal. Both tasks benefit from self-regulatory strategies. In this article we describe a series of experiments with children, adolescents, and young adults that investigate self-regulatory processes facilitating effective goal setting and successful goal striving. The experimental studies investigate (1) different routes to goal setting depending on how

* Corresponding author.
E-mail address: oettingen@psych.nyu.edu (G. Oettingen).

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people mentally elaborate a desired future, and (2) effective strategies of goal implementation depending on whether people furnish their set goals with plans on where and when to initiate relevant behavior.

Students have multiple and often conflicting goals, influenced in many ways by their surroundings. Adolescent students, for example, have both interpersonal and achievement goals such as becoming a successful student, earning approval from others, making and keeping friendships, having fun, learning new things, getting things done on time, and so forth (Wentzel, 1989). Researchers have further distinguished different types of achievement goals. For example, achievement goals towards growing competence and improvement versus achievement goals that are geared towards demonstrating ability and performance relative to others (mastery versus performance goals, Ames & Archer, 1988; Ames, 1992; learning versus performance goals, Dweck, 1996, Dweck & Leggett, 1988; task-involvement versus ego-involvement goals, Nicholls, 1984). Urdan and Maehr (1995) have pointed to achievement goals of a more social nature, including social welfare goals (i.e., becoming a productive member of one's society), social solidarity goals (i.e., achieving to bring some degree of honor to one's family), and social approval goals (i.e., achieving to gain the social approval of teachers or peers).

The traditional approach to analyzing students' goals in educational contexts involves specifying the antecedents of various types of goals and, in turn, the consequences of having set such goals. The analysis of achievement goals also focuses on determinants and consequences of goal setting. With respect to the determinants of setting achievement goals, Dweck (1999) demonstrated that people's theories about the nature of aptitudes influence whether they set themselves learning (mastery, task-involvement) or performance (ego-involvement) goals. Incremental theorists who believe that ability can be improved by learning prefer to choose learning goals, whereas entity theorists who believe that ability is fixed and cannot easily be changed prefer to choose performance goals. Others have pointed out that it also is the structure of the tasks that students are given, the type of evaluation and recognition they receive from parents and teachers, and the amount of responsibility authorities take for the students' learning that determine whether students adopt learning, performance, social achievement, or other classroom goals (Ames, 1992; Blumenfeld, 1992; Nicholls, 1984; Wentzel, 1999; Urdan & Maehr, 1995).

Analysis of the consequences of setting achievement goals has established that learning goals are generally more conducive to excelling in achievement contexts than are performance goals (Dweck, 1999). In response to difficulties, students with performance goals are more vulnerable to a helpless orientation and deteriorate in their problem-solving strategies, while students with learning goals show a mastery orientation in response to difficulty, maintaining their problem-solving strategies (Elliott & Dweck, 1988; Ames, 1984). Classroom goals such as understanding things, getting things done on time, or being dependable and responsible also favor academic achievement (as assessed by grade point average), whereas classroom goals such as having fun or making and keeping friendships are a hindrance (Wentzel, 1989). Finally, Urdan and Maehr (1995; Blumenfeld, 1992) point out that achievement goals of a social nature (e.g., social approval goals) produce their effects in interaction with

the social context at hand. If the social approval goal focuses on one's peers, negative effects on achievement prevail, whereas when the focus is on one's parents, there are positive effects on achievement. Given that goals of a certain content or type facilitate successful academic achievement, whereas goals of another content or type are hindrances, it seems important for students to learn to set goals of appropriate content (e.g., learning goals).

A less content-oriented approach to analyzing the precursors of effective goal setting and goal striving also exists. As Sockett (1988) pointed out, there are a number of personal qualities one can develop (i.e., carefulness, conscientiousness, self-restraint, and endurance) to facilitate any kind of goal pursuit. Julius Kuhl (1984; Kuhl & Beckmann, 1994) differentiates three volitional or self-regulatory strategies that refer to the management of cognitive activities regulating the information pertaining to goals (i.e., active attentional selectivity, encoding control, parsimony of information processing). These he sets in contrast to emotion and motivation control strategies, posited to be useful in managing disruptive emotional states and strengthening the motivational basis of one's goals, respectively. Finally, environmental control strategies are said to enhance one or more of the basic strategies by manipulating aspects of the individual's environment. Kuhl and his colleagues (Kuhl & Beckmann, 1994) report that application of these volitional strategies facilitates goal attainment, and that people differ in terms of their predisposition to use the named volitional strategies (i.e., state- vs. action-orientation).

Since Kuhl's pioneering work on volitional strategies, many others have pointed to the importance of volitional or self-regulatory strategies for effective goal pursuit (Corno & Kanfer, 1993; Snow, Corno, & Jackson, 1996; Heckhausen & Gollwitzer, 1987; Gollwitzer, 1990). Furthermore, additional effective volitional strategies have been identified (e.g., strategic automation of action initiation through implementation intentions, Gollwitzer, 1993, 1999; process versus outcome simulations, Taylor, Pham, Rivkin, & Armor, 1998).

1. Goal emergence

The recent acknowledgment of the importance of self-regulatory processes for effective goal implementation is not matched in current research on goal emergence. Research on goal emergence or goal setting has focused on the question of which individual differences (e.g., holding an incremental versus an entity theory of human capabilities, Dweck, 1999; having an ideal versus an "ought" self-discrepancy, Higgins, 1997) or context factors (e.g., classroom structure, Ames, 1992) facilitate the emergence of what kind of goal.

It seems important to recognize, however, that goal setting can also be analyzed from a self-regulatory perspective. Bandura (1997) suggested that having successfully achieved a set goal stimulates the setting of ever more challenging goals, due to a person's heightened sense of efficacy which is based on having successfully attained the prior goal. Others have pointed out that the core processes of goal setting involve committing oneself to achieving a certain incentive (Klinger, 1977). Heckhausen and

Kuhl (1985) argued that the lowest degree of commitment to an incentive is a mere wish to attain it. A wish that is tested for feasibility becomes a want, which carries a higher degree of commitment. To develop a full goal commitment (i.e., to form the intention to achieve a certain incentive), a further relevance check must be carried out relating to necessary means, opportunities, available time, relative importance, and urgency.

In their Rubicon model of action phases (Heckhausen & Gollwitzer, 1987; Heckhausen, 1991; Gollwitzer, 1990) assume that people entertain more wishes than they have time or opportunities to realize. Therefore, they must select from among them, with wishes with high feasibility and desirability having the best chance. The transformation of wishes into goals is understood as a resolution, resulting in a feeling of determination to act. This resolution is made when people sense that the feasibility and desirability of a wish is not only acceptably high, but has been exhaustively deliberated and correctly assessed (Gollwitzer, Heckhausen, & Ratajczak, 1990).

1.1. Goal emergence and different modes of self-regulatory thought

A recent theory on fantasy realization (Oettingen, 1996, 1999) analyzes goal setting by delineating different routes of goal formation that are based on different modes of self-regulatory thought. First, this theory differentiates between two forms of thinking about the future: expectations versus free fantasies. Specifically, expectations are judgments of how likely it is that certain events or behaviors will occur in the future (Bandura, 1977; Mischel, 1973; review by Olson, Roese, & Zanna, 1996). Based on experiences in the past and thus on a person's performance history, expectations specify the probabilities of whether an event will actually happen or not. Free fantasies, to the contrary, are future events or behaviors that appear in the mind (Klinger, 1990; Singer, 1966), independently of whether it is likely or unlikely that they will occur. For example, despite perceiving the chances of excelling in academic performance to be low, a student can indulge in positive fantasies about becoming a highly successful student.

The difference between thinking about the future in terms of beliefs or expectancy judgments versus mere thoughts or fantasies is elucidated by William James (1890). James differentiated between beliefs or judgment, on the one hand, and free thoughts or images, on the other: "Everyone knows the difference between imagining a thing and believing in its existence, between supposing a proposition and acquiescing in its truth" (p. 283). According to James beliefs or judgments are the product of examining the reality of a cognized event, while thoughts or images simply depict events in the stream of thought.

Fantasy realization theory elucidates three routes to goal setting that result from how people elaborate their fantasies about the future. People can mentally contrast their fantasies about a desired future with present reality, or in their mental elaborations focus solely on either the future or the reality. Mental contrasting leads to expectancy-based goal setting, whereas indulging in positive fantasies and dwelling on negative reality leads to expectancy-independent goal setting.

The expectancy-based route to goal setting, then, rests on mentally contrasting fantasies about a desired future with present reality. On a micro-level of analysis

(Oettingen, Pak, & Schnetter, in press), mental contrasting leads to the simultaneous accessibility of cognitions related to the desired future and the present reality, and to the activation of the relational construct that reality "stands in the way" of the desired future. Therefore, a necessity to act towards changing reality into the desired future is experienced, and expectations whether present reality can indeed be turned into the desired future are activated and used (Olson et al., 1996). A strong goal commitment should emerge when expectations of success are high; when expectations of success are low, goal commitment should be weak.

The second route to goal commitment originates from solely fantasizing about a positive future. Such fantasies should seduce a person to enjoy the desired future in the here and now, and thus one fails to recognize that the present reality stands in the way of the desired future. A necessity to act is not experienced and expectations of success are not activated and used. Commitment towards fantasy realization solely reflects the implicit motivation (pull) triggered by imagining the desired future (McClelland, Koestner & Weinberger, 1989). It should be moderate and independent of the perceived chances of success (i.e., expectations of success). As a consequence, people will try too hard when underlying expectations of success are low, and not try hard enough when underlying expectations of success are high.

The third route to goal commitment is based on merely reflecting on the negative reality. Merely reflecting on negative aspects of present reality produces continual ruminations, as no fantasies about a positive future designate the direction to act. Hence, a necessity to act is not experienced, and expectations are not activated and used. Commitment towards fantasy realization should solely reflect the implicit motivation (push) triggered by reflecting the negative reality (McClelland et al., 1989). As with indulging in positive fantasies about the future, commitment should be moderate and independent of perceived chances of success so that people will either try too hard or not hard enough.

In experimental studies by Oettingen (2000), participants who had to mentally contrast fantasies about desired futures with present reality used expectations of success to determine their strength of commitment towards fantasy realization. To the contrary, experimental participants who indulged in positive fantasies or dwelled on negative reality formed only moderately strong goal commitments independently of underlying expectations. In the first experiment, college students fantasized about getting to know an attractive stranger, while in the second experiment female doctoral students fantasized about successfully combining work and family life. Participants who contrasted fantasies with reality and held favorable expectations strongly committed themselves to realize the desired future. These participants felt eager to reach the desired future, they were willing to exert extended effort, and they anticipated strong disappointment if the desired future were to fail. In addition, they reported to have planned ways to realize their fantasies. When participants in the mental contrasting condition held unfavorable expectations, they showed the lowest levels of goal commitment. Indulging in fantasies about a desired future or dwelling on negative reality, to the contrary, led to a moderate, expectancy-independent goal commitment.

1.2. Related views on future orientation

Fantasy realization theory differs from research demonstrating that thinking of future events influences the level of expectations and in turn influences motivation (Anderson, 1983; Gregory, Cialdini, & Carpenter, 1982; Taylor & Schneider, 1989). It is not the fact of thinking about the future which is at issue, but how participants go about it: Mentally contrasting a desired future with present reality differs from indulging in the desired future and from dwelling on negative reality. Consequently, rather than predicting level of goal commitment on the basis of changes in level of expectations, fantasy realization theory focuses on people's experienced necessity to act and thus on the link between expectations and goal commitment.

Fantasy realization theory addresses issues also investigated in the work of Taylor et al. (1998) that examines different forms of goal pursuit simulation. Taylor et al. (1998) observed that process simulations (i.e., imagining the implementation of goal-directed behaviors) are more effective in furthering the attainment of a set goal (e.g., getting an "A" or a high grade in a course) than outcome simulations (i.e., imagining having attained the set goal). Both models ultimately attempt to predict differences in goal pursuit and goal attainment on the basis of differential thinking about an anticipated future. From the present perspective, Taylor et al.'s process simulations can be understood as a consequence of mental contrasting in light of high expectations, whereas outcome simulations may be a consequence of indulging in positive fantasies. Indeed, Oettingen (2000, Study 2) observed most process simulations in contrasting participants with high expectations (i.e., participants with the highest goal commitment).

The first study to be described here assessed goal commitment to excel in school achievement. We measured goal commitment in terms of studying hard and achieving well in learning the first foreign language. In contrast to much existing research, we assessed goal commitment not in its affective and cognitive form, but in its behavioral form. In addition, we did not only use self-report measures of effort, but also asked independent evaluators to rate students' effort and performance. Participants were children of middle childhood, who had just started with their first foreign language in school.

2. Experiment 1: excelling in the first foreign language

Learning one's first foreign language is a strong incentive for boys and girls in middle childhood. In Berlin, Germany, where the present study was conducted, fifth graders (10–12 years old children) having just started to study English should therefore find it easy to fantasize about excelling in this new subject. Moreover, as academic success is uncertain, fantasies of excelling in English should be easily stimulated. Further, the complexity of learning a new foreign language should allow elaborations on present reality. Finally, students' individual performance histories in academic achievement should assure variance in expectations of success. In summary, excelling in English is a theme well suited to test whether the three modes of

self-regulatory thought (i.e., contrasting positive fantasies with negative reality, indulging in positive fantasies, dwelling on negative reality) differentially promote the emergence of academic goals.

Participants who mentally contrast their positive fantasies with impeding reality should commit themselves most strongly to excelling in English when expectations of success are high, and least strongly when expectations of success are low. To the contrary, "indulging" and "dwelling" participants should commit themselves at a medium level irrespective of whether their expectations of success are high or low. Accordingly, the strongest effort and the best performance should be observed in contrasting participants who perceive their chances of success as being high, and the weakest effort and the weakest performance should be observed in children who perceive their chances of success as being low. Indulging and dwelling participants should exert a moderate amount of effort and be moderately successful, no matter whether their subjective probabilities of success are promising or not.

As strong goal commitments persist over time (e.g., Atkinson & Birch, 1970), we expected these effects to emerge even after a substantial amount of time has elapsed. Therefore, we assessed performance two weeks and three months after the experiment.

2.1. Participants and procedure

Fifty-five children (30 boys and 25 girls) from three middle schools in Berlin participated. All children were native German speakers starting to learn English as their first foreign language. Parents were asked to give written consent to their children's participation after having been informed about the course of the study, that participation was voluntary and data would remain confidential and anonymous. Teachers had not given any course grades in English yet. The fifth graders volunteered from eight classrooms (seven, five, and nine students from three classrooms in school A; seven, six, and eight students from three classrooms in school B; and seven and six children from two classrooms in school C). They had a mean age of 11.0 years ($SD = 0.5$), ranging from 10.3 to 12.8. The experiment took place in the students' regular classrooms in absence of the teachers. Students received a small surprise gift after participating in the experiment.

Participants completed their forms in the classroom. To guarantee anonymity, participants' names were cut off from the filled out forms right after the experiment and sheets assigning codes to names remained in the school. As course grades were one of the dependent variables, it was important to control statistically for individual differences in general intellectual skills. Two experimenters started the study by administering the RAVEN standard progressive matrices (Raven, 1971), a valid measure of general fluid intelligence. Thereafter, the experimenters addressed children's new school subject of English. It was explained that English is spoken all over the world, that it is used as the basis for communication in various life areas such as music, computers, and transportation, and that many books and journals are written in English.

To assess participants' expectations of excelling in English, they were asked "How well do you think you will do in English?" Participants answered this question by

using two 5-point response scales ranging from "*much worse than in other subjects*" to "*much better than in other subjects*" and from "*much worse than my classmates*" to "*much better than my classmates*". To assess the incentive value of excelling in English, they were asked "How important is it to you that you will do well in English?". The 5-point response scale reached from "*not at all important*" to "*very important*."

Finally, participants were randomly assigned to three experimental groups: the fantasy-reality contrast group, the positive fantasy group, and the negative reality group. In the *fantasy-reality contrast condition* students had to list and then elaborate one positive aspect of excelling in English, and then one negative aspect of present reality that stands in the way of excelling in English. More specifically, to have them list a positive aspect the children were told: "Imagine that you do really well in English. What would happen then? What would be the most wonderful thing? Please write it down". Children listed for example, "that I can talk to the Back Street Boys", "that my father is happy", "that I can speak English fluently". Instructions for the mental elaboration of this positive aspect followed: "Imagine now the most wonderful thing. Think up a story about it and write the story down. Write down everything that comes to your mind about the most wonderful thing." The rest of the page was empty so children could write down their story about the most wonderful thing.

On the next page they found the instructions for listing and elaborating one negative aspect of reality: "Sometimes it happens that something that you wish does not come true. Why might it not come true that you do really well in English, even though you would like to do well? Think about all that could interfere with your doing really well in English. What do you dread most? Please write it down." On the line below children were supposed to write down what they dreaded most. Thereafter participants were told: "Imagine now what you dread most. Think up a story about it and write the story down. Write down everything that comes to your mind with respect to what you dread most."

Students in the *positive fantasy only condition* received the same instructions as the fantasy-reality-contrast group with regard to listing and elaborating the positive future. Thus on the first page they had to list and elaborate in writing the most wonderful aspect of doing really well in English. On the second page they received the following instructions: "Imagine again that you do really well in English. What would happen then? What would be the second most wonderful thing? Please write it down". On the line below the children listed the second most wonderful thing. Then the mental elaboration instructions for this second most wonderful thing followed: "Imagine now the second most wonderful thing. Think up a story about it and write the story down. Write down everything that comes to your mind about the second most wonderful thing."

Students in the *negative reality only condition* received the same instructions as the fantasy-reality-contrast group with regard to listing and elaborating a negative aspect of present reality. Thus on the first page they had to list and elaborate in writing the most dreaded aspect of reality that could interfere with doing really well in English. On the second page they received the following instructions: "Why else might it not come true that you do really well in English, even though you would like to do well? Think again about all that could interfere with your doing really well in English. What

do you dread second most? Please write it down." On the line below the children listed the second most dreaded thing that could interfere with doing really well in English. Then the mental elaboration instructions for the second most dreaded thing followed: "Imagine now what you dread second most. Think up a story about it and write the story down. Write down everything that comes to your mind with respect to what you dread second most."

2.2. Dependent variables

Two weeks after the experiment we returned to the schools and assessed children's persistent effort in preparing for their English lessons by self-report and teacher evaluations. Children were asked with respect to the last two weeks: "How well did you prepare for your English lessons?" They answered this question by using three 5-point scales reaching from "*not at all*" to "*very well*", from "*much worse than my classmates*" to "*much better than my classmates*," and from "*much worse than in other subjects*" to "*much better than in other subjects*." Internal consistency of the three scales was acceptable (Cronbach's *alpha* = 0.72).

English teachers were asked to indicate the extent to which each of the following would apply to each of the students over the last two weeks. "The student was intrinsically interested in English." "The student showed persistent effort in studying English." "The student has payed attention in class." "The student tried very hard." "The student did extra work". Teachers answered these questions using five-point scales reaching from 1 (*not at all true)* to 5 (*very true)*. Internal consistency was high (Cronbach's *alpha* = 0.96).

To assess academic performance, teachers were asked: "Which oral grade would you give to the student if today was the day of report cards?" We assessed oral grades because children had not taken any written tests yet. The scale taken from German report cards ranged from 1 (*very good*) to 6 (*failed*). Finally, we assessed course grades in English from the report cards the children received in February, three months after the experiment, ranging from 1 (*very good*) to 6 (*failed*).

At the end of the study, we debriefed participants and teachers. We explained in detail the purpose of the study, the hypotheses tested, and the experimental design. We encouraged students and teachers to contact us at any time with further questions.

2.3. Results: descriptive analyses

Responses to the two scales measuring expectations of success correlated highly ($r = 0.69$) and thus were combined in an overall expectation measure. The mean level of individual participants' expectations of being successful in their new subject English was above the mid-point of the scale ($M = 3.58$, SD = 0.82; range 1.5–5; $N = 55$). Expectations of success did not differ for boys and girls, $F(1,53) = 0.00$; $p = 0.99$, or between conditions, $F(2,52) = 0.21$; $p = 0.81$. Mean levels of persistent effort measured by self-report as well as by teachers' reports were in the upper half of the scales (self-report: $M = 3.66$, SD = 0.74, ranging from 2 to 5; teachers' reports: $M = 3.01$, SD = 1.02, ranging from 1 to 4.8). The two variables correlated positively ($r = 0.38$,

$p = 0.008$). Academic performance two weeks after the experiment was rather high ($M = 2.79$, SD = 1.35). After reverse-coding the scale, academic performance two weeks after the experiment correlated positively with persistent effort assessed by self-report ($r = 0.36$, $p = 0.01$) and persistent effort assessed by teachers ($r = 0.70$, $p < 0.001$). Academic performance three months after the experiment ($M = 2.92$, SD = 1.10) correlated strongly with academic performance two weeks after the experiment ($r = 0.87$, $p = 0.001$).

Dependent variables were controlled for intelligence (RAVEN) and for incentive value. Expectations were controlled for incentive value only, as expectations are based on past performance that in turn depends on intelligence. However, analyses with expectations controlled for intelligence yielded the same results as did the analyses with expectations not controlled for intelligence. Furthermore, to control for teacher and peer group influences in the different classrooms (Beach, 1994; Schunk, 1995), analyses using independent and dependent variables standardized per classroom were performed. Children from the three schools differed neither in their RAVEN scores, their expectations of success, nor in any of the dependent variables (all p's > 0.25).

2.4. *Results*: *missing data*

Because some teachers failed to return questionnaires, there were seven missing values concerning teachers' reports of persistent effort and course grades that were distributed across all conditions. In addition, one student in the positive fantasy group did not answer the self-report items. The missing data of the eight students were replaced by group means in respective conditions (Tabachnik & Fidell, 1989). Analyses of all dependent variables with and without replacing missing data yielded the same patterns of results.

2.5. *Results*: *self-reported effort*

The link between students' expectations of success and their self-reported effort (Fig. 1) was stronger in the contrast condition ($r = 0.65$) than in the positive fantasy only condition ($r = -0.12$). To test the difference between these correlations for significance, the correlation coefficients were transformed (Fisher's Z transformation), a difference score was computed, and the difference score was tested against zero by means of a z-test (Ferguson, 1959; $z = 2.54$, $p < 0.01$). The same procedure was followed for all between-group comparisons. The contrast condition ($r = 0.65$) and the negative reality only condition ($r = 0.13$) also turned out to be different ($z = 1.66$, $p < 0.05$). There was no difference between the positive fantasy and the negative reality only group in the links between expectations and self-reported effort ($z = 0.65$, $p = 0.25$).

To test for differences in the mean levels of self-reported effort between students who entertained high expectations ($n = 29$) versus low expectations ($n = 26$), a 2 (expectations: high versus low) $\times 2$ (conditions: contrast versus others) ANOVA was performed, comparing the contrast condition versus the other conditions. This analysis yielded a significant interaction effect, $F(1,51) = 4.31$, $p < 0.05$. Students in the

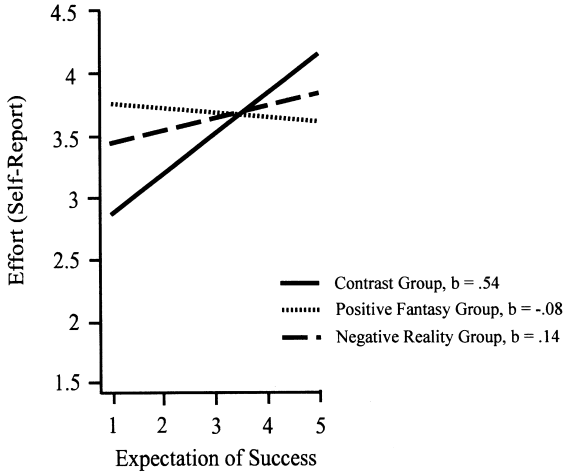

Fig. 1. Regression lines depicting the link of expectations of success to self-reported effort (adjusted for Raven scores and perceived incentive) as a function of self-regulatory thought ($N = 55$, student scores standardized within class).

contrast condition tended to exert more effort in learning English than students in the other groups when expectations of success were high, $F(1,51) = 1.89$, $p = 0.17$. When expectations of success were low, they tended to exert less effort, $F(1,51) = 2.42$, $p = 0.12$.

2.6. *Results*: *teacher-rated effort*

For teacher-rated effort, a similar pattern emerged (see Fig. 2). The link between expectations and teacher-rated effort was stronger in the contrast condition ($r = 0.64$) than in the positive fantasy only condition ($r = 0.09$; $z = 1.91$, $p < 0.03$) and in the negative reality only condition ($r = -0.00$; $z = 2.20$, $p = 0.01$). There was no difference between the positive fantasy only group and the negative reality only group in their links between expectations and teacher-rated effort ($z = 0.26$, $p = 0.39$).

To test for differences in the mean levels of teacher-rated effort between students who entertained high versus low expectations in the contrast condition versus the other conditions, a 2 (expectations: high versus low) $\times 2$ (conditions: contrast versus others) ANOVA was performed. The result was a significant interaction effect, $F(1,51) = 9.55$, $p < 0.01$. Students in the contrast condition showed more effort to learn English than those in the other groups when expectations of success were high, $F(1,51) = 12.34$, $p < 0.001$. When expectations were low, contrasting children did not differ from those in the other groups, $F(1,51) = 0.09$, $p = 0.76$.

2.7. *Results*: *academic performance two weeks after the experiment*

The link between expectations and teacher-rated academic performance two weeks after the experiment was stronger in the contrast condition ($r = 0.79$) than in the

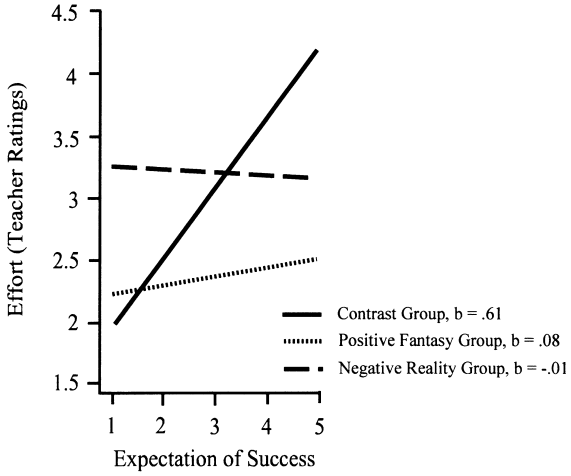

Fig. 2. Regression lines depicting the link of expectations of success to teacher-rated effort (adjusted for Raven scores and perceived incentive) as a function of self-regulatory thought ($N = 55$, student scores standardized within class).

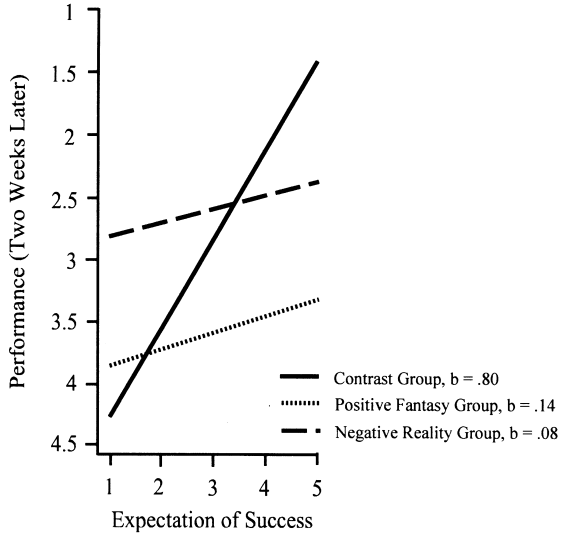

Fig. 3. Regression lines depicting the link of expectations of success to course grades (adjusted for Raven scores and perceived incentive) two weeks after the experiment as a function of self-regulatory thought ($N = 55$, student scores standardized within class).

positive fantasy only condition ($r = 0.19$; $z = 2.46$, $p < 0.002$) and in the negative reality only condition ($r = 0.09$; $z = 2.75$, $p = 0.003$). There was no difference between positive fantasy and negative reality conditions in their links between expectations and academic performance ($z = 0.26$, $p = 0.39$) (see Fig. 3).

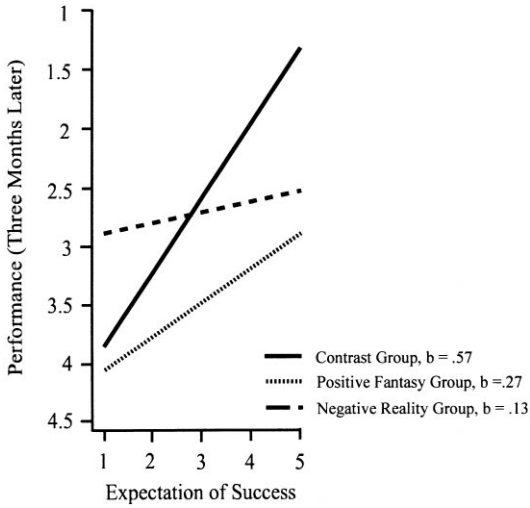

Fig. 4. Regression lines depicting the link of expectations of success to course grades (adjusted for Raven scores and perceived incentive) three months after the experiment as a function of self-regulatory thought ($N = 55$, student scores standardized within class).

To test for differences in the mean levels of academic performance two weeks after the experiment between students who entertained high versus low expectations in the contrast condition versus the other conditions, a 2 (expectations: high versus low) $\times 2$ (conditions: contrast versus others) ANOVA was performed. The result was a significant interaction effect, $F(1,51) = 8.75$; $p < 0.005$. Students in the contrast condition showed stronger academic performance than students in the other groups when expectations of success were high, $F(1,51) = 15.95$, $p < 0.001$. When expectations were low, children in the contrast group did not show weaker performance than their classmates in the other groups, $F(1,51) = 0.11$, $p = 0.73$.

2.8. Academic performance three months after the experiment

The link between expectations and academic performance as assessed by report card grades given three months after the experiment tended to be stronger in the contrast condition ($r = 0.69$) than in the positive fantasy only condition ($r = 0.31$; $z = 1.48$, $p = 0.06$) and the negative reality only condition ($r = 0.14$; $z = 1.98$, $p = 0.02$). There was no difference between the positive fantasy and the negative reality conditions ($z = 0.46$, $p = 0.32$) (see Fig. 4).

To test for differences in the mean levels of performance between students who entertained high versus low expectations in the contrast condition versus the other conditions, a 2 (expectations: high versus low) $\times 2$ (conditions: contrast versus others) ANOVA was performed. The result was a significant interaction effect, $F(1, 51) = 5.38$, $p < 0.03$. Students in the contrast condition showed stronger academic performance than students in the other groups when expectations of success were high,

$F(1, 51) = 12.22$, $p = 0.001$. When expectations were low, children in the contrast group did not show weaker academic performance than their classmates in the other groups, $F(1, 51) = 0.01$, $p = 0.94$.

2.9. Changes in expectation or incentive value as alternative processes

Expectations and incentives were measured a second time directly after the manipulation (T2) and a third time two weeks after the experiment (T3). Expectations and incentives did not change as a function of condition from before the experiment to right after or two weeks after the experiment (all p's > 0.25). In addition, when repeating all analyses with the dependent variables statistically controlled for expectation and incentive value measured at T2 or T3, the pattern of results stayed unchanged. These observations show that the mental contrasting instructions did not affect levels of expectations and incentives, and therefore, the differential effects of mental contrasting, indulging, and dwelling on the expectancy-to-effort link or the expectancy-to-performance link cannot be explained by systematic changes in expectation or incentive value.

2.10. Discussion of results

Strong goal commitments emerge when individuals mentally contrast their fantasies about a desired future with negative aspects of impeding reality and chances of success are perceived as being high. Children of middle childhood turned their free fantasies about excelling in an important academic subject (i.e., learning a foreign language) into binding academic goals which they then successfully pursued. Sheer fantasizing about reaching academic success and mere reflecting on present reality led to moderate goal setting and goal striving independent of perceived chances of success. The present research is a first step towards answering the question of which processes are responsible for students' setting binding achievement goals. If developmental tasks (e.g., acquiring basic skills in school; Havighurst, 1948/1972; Oettingen, 2000) hold great promise and are perceived as being feasible, children as young as 10–12 years old profit from mentally contrasting their wishful thinking with impeding reality.

The present study shows that mental contrasting is a straightforward self-regulatory procedure. A single aspect of the positive future has to be mentally elaborated prior to a single aspect of negative reality. We assume that this procedure makes the desired future and the negative reality simultaneously accessible, whereby the present reality is perceived as standing in the way of the desired future. As a consequence, a necessity to act is experienced that makes individuals consult their expectations of success. When expectations of success are high, binding goal commitments leading to increased effort and high academic performance emerge.

In contrast to previous experiments (Oettingen, 2000), we not only measured self-reported effort, but also asked experienced observers (i.e., teachers) to rate students' effort. Teacher-rated effort replicated the self-report data. Obviously, when expectations of success are high, mental contrasting leads to goal commitment that

can be subjectively experienced as well as objectively observed. Students' efforts even translated into actual performance. Two weeks after the experiment, high-expectancy children who had mentally contrasted their positive fantasies with negative reality were achieving better than their peers in the other groups, an effect that even extended over a period of three months.

When comparing self-reported effort versus teacher-rated effort (Fig. 1 versus Fig. 2), students in the fantasy only group were granted less effort by their teachers than students perceived themselves exerting, whereas in the other two conditions more concordance between self- ratings and teacher-ratings is observed. Students in the fantasy only condition may have shown signs of low effort (e.g., intense and happy daydreaming) that were picked up by their teachers, but were not taken into account by the students themselves when judging study effort. Still, as predicted by fantasy realization theory, both self-rated effort and teacher-rated effort of students in the fantasy only group did not evidence a substantive link to students' expectations of success.

For students with low expectations of success we did not observe differences between the contrast group and the other groups in level of teacher-rated effort and performance. This unexpected finding might be due to a bottom effect, as teachers attributed effort generously and graded students' performance leniently. Over 95% of the participants were evaluated as showing at least some effort (i.e., were rated one point higher than the lowest point of the scale) and received a grade that was two levels higher than the worst grade possible. Had the grades extended to the negative endpoints of the scales (i.e., low effort and low achievement), mental contrasting in light of low expectations might have led contrasting participants to exceed the participants in the indulging and dwelling groups in terms of being accorded low effort and receiving bad grades.

In sum, the present study demonstrates that fantasy realization theory also applies to setting achievement goals in educational settings (i.e., the classroom) by children of middle childhood. Moreover, it not only holds when commitment is assessed by cognitive and affective measures (Oettingen, 2000), but also when the behavioral consequences of commitment are assessed. And this is true no matter whether these behavioral indicators are reported on by participants themselves or observed by independent raters (i.e., teachers). Moreover, the present findings were recently replicated for the fantasy theme of excelling in mathematics. Participants were adolescents who attended a vocational school of computer programming (Oettingen, Pak, & Schnetter, in press).

2.11. Applied implications

Young children entertain naive optimism with respect to their performance in school (Stipek, 1984). It seems possible that naive optimism also characterizes students who start a new field of study. Indeed, in the present study students entertained expectations of success that were high ($M = 3.58$ on a five point scale). If one wants to help children to translate their naive optimism into binding goals, it seems critical to have them contrast their respective fantasies with impeding reality. Only then will students form strong goal commitments that are followed by strong performances.

Indulging or dwelling students, to the contrary, will not translate their naive optimism into strong goal commitments and subsequent strong performances. But indulging in fantasies is not maladaptive for all students. Those who have lost their naive optimism (e.g., by unambiguous negative feedback, Oettingen, Little, Lindenberger, & Baltes, 1994; Stipek, Roberts, & Sanborn, 1984) should benefit from indulging in fantasies as it leads to moderate goal commitment even in light of low expectations of success. Therefore, educators would be well-advised to encourage students with low expectations of success to fantasize positively about their future achievements. Simultaneously to encouraging students to indulge in positive fantasies about their future achievements, however, teachers should find ways to strengthen students' expectations of success (e.g., by having students acquire new competencies or by providing powerful models; Bandura, 1997). Only when expectations of success are sufficiently high should teachers suggest the contrasting procedure that will then produce strong goal commitments.

The implications discussed so far are based on the assumption that students' subjective expectations of success reflect their objective potential. If the objective potential is not reflected in a student's subjective expectations, the effects of the three modes of self-regulatory thought have quite different implications. Erroneously low or high expectations of success will lead to irrationally weak or strong efforts to reach one's fantasies after contrasting. Students should stay passive even though obstacles can be overcome, or they become active in the face of insurmountable obstacles. Indulging and dwelling in light of erroneously low or high expectations may be less detrimental, however, because students will be less extreme in terms of showing a lot of effort or no effort at all.

Most research on raising motivation in education has focused on increasing expectations to promote effort and performance. There are a host of intervention programs geared at promoting high expectations in school (Bandura, 1997; Bandura & Schunck, 1981; Schunk, 1991) and work (meta-analysis by Stajkovic & Luthans, 1998). However, our results imply that heightened expectations of success will be translated into actual achievement only when people contrast their imagined positive future with negative aspects of present reality. Otherwise students' efforts and performances will remain moderate, and thus the efficacy strengthening interventions are in vain.

Contrasting positive fantasies about the future should not only help students, but also their teachers. For example, mentally contrasting fantasies about good teaching with negative aspects of present reality (e.g., lack of preparation) should turn these fantasies into binding goals, if chances of success are perceived as being high. Or, contrasting positive fantasies about helping a particular gifted student to unveil his or her potential with negative aspects of reality (e.g., one's lack of patience) should create a strong goal to support the student. One has to keep in mind, however, that some teachers' expectations for their own success might be rather low. For them, it seems important to indulge in fantasies about the future and meanwhile to provide access to professional development programs.

Finally, mental contrasting is a self-regulatory skill and knowing how to perform the implied mental procedures does not yet guarantee their effective application. It

seems important, therefore, that mental contrasting not only be taught to students, but that its use be practiced. Moreover, students need to learn when applying the mental contrasting procedure versus the indulging procedure is most beneficial. More specifically, mental contrasting seems fully appropriate when the implied positive futures are controllable (e.g., becoming a doctor) in the sense that they can be mastered (when expectations are high) or relinquished (when expectations are low). When a person's future is uncontrollable and, at the same time, inescapable in the sense that it can neither be mastered nor relinquished (e.g., when a person suffers a severe learning disorder), indulging in positive fantasies seems more appropriate than contrasting. Indulging in positive fantasies keeps a person at least moderately engaged in a future that cannot be given up easily (e.g., fantasizing may prevent a low achieving student from flunking out of school).

2.12. Implications for research on goal setting

Setting learning goals is more beneficial than setting performance goals when it comes to task enjoyment and coping with failure (Dweck, 1996, 1999). Instigating learning goals seems to demand that positive fantasies about improving one's standing are contrasted with aspects of reality that hinder effective learning. This type of contrasting should be particularly effective in creating learning goals with people who entertain incremental theories (i.e., capabilities can be improved), because incremental theorists believe in the possibility of change and thus expectations of success in the future should be high. This implies that incremental theorists mental contrasting of a positive future with impeding reality should hardly ever lead to abstaining from fantasy realization.

If one wants to instigate promotion rather than prevention goals (because promotion goals are known to facilitate goal attainment more than prevention goals, Higgins, 1997; Shah, Higgins, & Friedman, 1998), it is important to encourage people to create visions about attaining aspirations and accomplishments rather than fulfilling obligations and reaching safety. Visions about attaining aspirations and accomplishments should then be contrasted with respective aspects of impeding reality which often might be a person's obligations. According to Higgins (1997), students who possess ideal self-guides (describing the person one hopes or aspires to be) should find it easier to develop visions about attaining aspirations and accomplishments.

Finally, even though in their Rubicon model of action phases Heckhausen & Gollwitzer (1987; Gollwitzer, 1990) recognize the importance of goal setting as a first step towards goal attainment, the Rubicon model does not delineate self-regulatory strategies of goal setting (Oettingen & Gollwitzer, in press). The action phases model only states that people should consider feasibility and desirability when turning their wishes into goals. Fantasy realization theory, on the other hand, spells out what kind of mentation guarantees that people actually take expectations (feasibility) into account when they set themselves goals. The present experiment shows that it takes a special self-regulatory effort (i.e., contrasting positive fantasies about the future with present reality) for the issue of feasibility to receive concern. Whereas the action phases model spells out what criteria people should use when making goal

commitments, fantasy realization theory differentiates various self-regulatory modes of thought that make (contrasting) or do not make (indulging and dwelling) people respect these criteria when setting themselves goals.

3. Goal implementation

As experience tells us, there is often a long way from goal setting to goal attainment (e.g., becoming proficient in a foreign language). Having set a goal is just a first step that is commonly followed by a host of implementation problems that need to be successfully resolved. Predictions about successful goal attainment can be made on the basis of structural and thematic differences of the set goal (e.g., promotion versus prevention goals; Higgins, 1997; learning versus performance goals; Dweck, 1999; specific versus do your best goals; Locke & Latham, 1990; proximal versus distal goals; Bandura & Schunk, 1981). A more process-related self-regulatory approach, however, focuses on how the problems of goal pursuit are managed by the individual. These problems are manifold as they pertain to initiating goal-directed actions and bringing them to a successful ending. To effectively solve these problems, the person needs to seize good opportunities to act, ward off distractions, flexibly step up efforts in the face of difficulties, bypass barriers, compensate for failures and shortcomings, and negotiate conflict between goals. Various theories, termed self-regulation theories of goal striving (reviews by Gollwitzer & Moskowitz, 1996; Oettingen & Gollwitzer, in press), address how the individual successfully masters these problems of goal implementation.

Gollwitzer (1993, 1999) suggests a volitional or self-regulatory strategy that helps people make use of good opportunities to perform goal-directed behaviors. Set goals (goal intentions, such as: "I intend to reach outcome x!" or "I intend to perform behavior y!") commit an individual to attain the specified desired future (either an outcome or behavior). However, they do not commit the individual to when, where, and how he or she wants to attain that future. Such additional commitments can be added by forming implementation intentions that take the format of "If I encounter situation x, I will perform the goal-directed behavior y!"

Forming implementation intentions is indeed a powerful self-regulatory tool for overcoming problems of getting started with goal-directed actions (e.g., when people are tired, absorbed with some other activity, or lost in thoughts, and thus miss good opportunities to act). It has been observed that difficult to reach goals benefit greatly from being furnished with implementation intentions. This effect extends to many aspects of personal endeavors, including resolving important interpersonal conflicts and performing an assigned task on time (Gollwitzer & Brandstätter, 1997), performing a medical self-examination (Orbell, Hodgkins, & Sheeran, 1997), regularly taking vitamin supplements (Sheeran & Orbell, 1999), and eating healthy foods (Verplanken & Faes, 1999). The effect also holds for groups of people who are known to have problems turning goals into action, such as opiate addicts who are under withdrawal (Remlinger, 1997), schizophrenic patients (Schmitt, 1997), or patients with a frontal lobe injury (Lengfelder & Gollwitzer, in press).

Because implementation intentions spell out links between situational cues and goal-directed behavior, it is assumed (Gollwitzer, 1999) that by forming such intentions people pass on the control of goal-directed behavior to situational cues, thus, facilitating the initiation of goal-directed actions. As a consequence, the mental representation of the specified situational cues becomes highly activated, making these cues more accessible. Various experiments demonstrated that situational cues specified in implementation intentions are more easily detected, remembered, and more readily attended to than comparable non-intended situations. Moreover, it is hypothesized that implementation intentions create strong associative links between mental representations of situations and actions which otherwise are only achieved through consistent and repeated acting in these situations. As a consequence, action initiation becomes automatic. Various experiments (e.g., see Gollwitzer, 1996) demonstrate that the goal-directed behavior specified in implementation intentions is initiated swiftly and effortlessly in the presence of the critical situation. Moreover, the subliminal presentation of the critical situations suffices to activate cognitive concepts and knowledge relevant to the initiation of the intended behavior.

In summary, forming implementation intentions creates automaticity that does not originate from laborious and effortful practice over time. People strategically decide to delegate their control over goal-directed behavior to anticipated critical situational cues. This type of automatization can be created on the spot, as it induces "instant habits." The easily accessible self-regulatory tool of forming implementation intentions can be used to increase tenacity when it comes to initiating goal-directed action.

Forming implementation intentions has parallels with other effective types of planning. Planning can be approached in a more reflective way through mental simulations that explore possible routes to achieving one's goal. Taylor et al. (1998) called such mental simulations process simulations. Process simulations, applied repeatedly, further goal attainment such as achieving good grades in academic exams. Apparently, repeated mental simulations of how to achieve the goal also result in firm plans.

The two studies to be described next were designed to explore whether implementation intentions also facilitate the implementation of academic goals. The first (Experiment 2) is an experiment designed to determine whether implementation intentions facilitate meeting the goal of writing a curriculum vitae with young unemployed adults who participated in a professional development workshop. The second (Experiment 3) addresses the issue of whether implementation intentions help students to do homework on time, and whether the facilitative effects of implementation intentions go beyond goal intentions that also specify the point in time at which the homework is to be done.

4. Experiment 2: composing a curriculum vitae

Twenty young adults (9 female, 11 male) who participated in a professional development workshop, volunteered. Age ranged from 16 to 39, with a mean of 25.1. At the beginning of the workshop, a female experimenter explained that participation

was voluntary and that the collected data were kept anonymous by using a sophisticated coding scheme. Then she explained that the study was designed to explore how young adults master a typical professional task: composing a curriculum vitae. Participants were first shown a model curriculum vitae, before they were instructed to compose their own vitae. The experimenter further explained that she would come back at 5 p.m. of the same day to collect the composed vitae.

Participants were randomly assigned to one of two conditions. In the *goal intention condition*, participants were induced to furnish the goal intention of writing a curriculum vitae with an irrelevant implementation intention. They were asked to decide (and report on a sheet of paper) where they intended to sit during lunch and when they wanted to have lunch. In the *implementation intention* condition, the goal intention of writing a curriculum vitae had to be furnished with a relevant implementation intention. Participants were asked to decide (and report on a sheet of paper) where and when they wanted to get started with composing their vitae.

Before the experimenter left the participants on their own, she asked them to answer two items designed to assess commitment to composing a curriculum vitae ("I feel committed to compose a curriculum vitae" and " I feel I have to complete this task"). Both items were accompanied by a 9-point answer scale (1 = don't agree; 9 = fully agree). When the experimenter returned 7 h after giving them their instructions, she collected the written curriculum vitae. The participants who had completed the assigned task were also asked where they actually had written their curriculum vitae.

Participants in the goal intention group and in the implementation intention group showed nearly the same, rather strong, commitment to the assigned task of composing a curriculum vitae (the mean of the two commitment items was $M = 5.51$ versus $M = 5.60$ in the two groups, respectively). Still, both groups differed in terms of handing in a curriculum vitae at 5 p.m. Whereas only two of the ten participants in the goal intention group (i.e., 20%) had performed the assigned task, eight out of ten did so in the implementation intention group (i.e., 80%). This difference was significant at the $p = 0.01$ level; $\mathrm{Chi}^2(1, N = 18) = 7.71$. When the experimenter asked the eight implementation intention participants who had performed the task whether they actually did so at the place they had specified in their implementation intentions, seven (i.e., 87 %) reported having done so.

Apparently, forming implementation intentions is a helpful self-regulatory tool when it comes to translating goal intentions into action. For this sample, writing the curriculum vitae became four times more likely when the goal intention to write a curriculum vitae was furnished with a relevant implementation intention that specified when and where one wanted to get started with this task. Similar effects have been demonstrated before with nonacademic goals (e.g., interpersonal goals; Gollwitzer & Brandstätter, 1997; health-protecting or health-promoting goals; Orbell, Hodgkins, & Sheeran, 1997; Sheeran & Orbell, 1999), and the present findings suggest that forming implementation intentions is also a useful volitional strategy when the realization of academic goals is at issue.

Moreover, the present findings support Gollwitzer's (1993, 1999) theory on how implementation intentions work. It is not that implementation intentions raise a person's commitment to the goal or task at hand. Actually, the strength of the goal

commitment was close to identical in the implementation intention and the goal intention groups. Rather, implementation intentions delegate the control of goal-directed behavior (i.e., getting started with writing the vitae) to situational cues and thus facilitate relevant action initiation. At least this is suggested by the observation that all but one of the implementation intention participants who handed in a curriculum vitae at 5 p.m. had written it at the exact place they had indicated beforehand.

5. Experiment 3: specified goal intentions versus implementation intentions

What makes implementation intentions effective? Is it simply the intention to perform a certain action at a given time and place ("I will perform behavior y in situation x!") or is it the act of furnishing goal intentions with an "if–then" plan ("... and if situation x arises, I will perform behavior y!"). Whereas in both cases a concrete situation is specified for the intended behavior, only in the latter case should the time and place become a direct cue for action. In other words, Experiment 3 raises the question of whether specifying one's goal intention to perform a certain behavior in terms of the when and where of the intended behavior suffices to facilitate action initiation. To answer this question, participants were assigned the goal of performing a series of arithmetic tasks each Wednesday morning over a period of four weeks. This goal intention was then either specified with a self-chosen exact point in time or, in addition, furnished with a respective implementation intention ("if–then" plan). The hypothesis was that delegation of behavioral control to the environment should only occur in the latter case; therefore, participants in this latter condition should be comparatively more successful with attaining their goal.

5.1. Subjects and procedure

Thirty-nine students at the University of Konstanz, each of whom owned a personal computer stationed at their homes, participated in the present experiment in exchange for a movie theater ticket and a small sum of money. Participants were invited to a meeting on a Monday or Tuesday where they learned about the presumed purpose of the study. The cover story told participants that the study would analyze the question of how the depth of a person's sleep affects her/his ability to concentrate. For this purpose, participants were asked to perform a concentration test every Wednesday morning for the next four weeks and report on the quality of their sleep the night before.

All participants were then handed a practice diskette that carried the concentration test (Düker & Lienert, 1959). Each trial of the test consisted of a simple arithmetic task. Each task presents two lines of numbers placed on top of each other. The participants are requested to first add up the numbers presented in the upper line (e.g., $2 - 3 + 7$) and then those presented in the lower line (e.g., $4 + 6 - 9$). Finally, both sums have to be added (accordingly, the correct solution of the present example is 7). In the present study, the concentration test was programmed such that the next task of the test was presented as soon as the participant had entered the solution of the

prior task into the computer. Participants could thus work on the test in a self-paced manner. After 5 min, no new tasks were presented.

Once participants had familiarized themselves with the concentration test, they were handed a new diskette to take home with them. This diskette carried four concentration tests to be performed on each Wednesday morning of the next four weeks. All participants were then handed a form that contained written instructions and a code number. The instructions started with asking participants to set themselves the following goal: "I will perform as many arithmetic tasks as possible on each Wednesday morning!" Participants then had to indicate an appropriate point in time on Wednesday morning.

In the *goal intention condition*, participants (9 females, 9 males) were finally requested to use the listed point in time to specify the assigned goal by stating: "I will perform as many arithmetic tasks as possible each Wednesday at _____(self-chosen time before noon)". In the *implementation intention condition*, participants (8 females, 7 males) were requested to use the listed point in time to form an implementation intention: "If it is Wednesday at _____ (self-chosen time before noon), I will perform as many arithmetic tasks as possible!"

Before participants left, they were handed the movie theater ticket and DM 3.50 (about $ 2). When participants started to work on the arithmetic tasks at home on their own computers, they first had to enter the time of their own watches and their code numbers. Unbeknown to the participants, the computer program also recorded the time of the computer's system clock. After five minutes of working on the arithmetic tasks, participants were asked to answer 16 questions that explored how well subjects had slept the night before. When the four weeks had passed, participants were also asked to answer a question assessing their goal commitment: "How committed were you to the goal of working on the arithmetic tasks?" (1 = weak to 9 = strong). Finally, they were requested to send the diskette back to the experimenter who responded by writing a letter that thanked participants and debriefed them.

5.2. Results and discussion

Of the 39 participants, 25 (i.e., 64 %) returned their diskette after the four weeks had passed (eight male and six female participants in the goal intention condition, and four female and seven male participants in the implementation intention condition). In both conditions, these participants reported a high degree of commitment to the goal of working on the arithmetic tasks ($M = 6.78$, SD = 1.30 versus $M = 6.64$, SD = 1.81) with no differences between groups.

The two groups did differ in how well starting work on the concentration test matched the intended starting times. In order to find out how well participants kept the time at which they intended to perform the concentration test, we computed the mean absolute difference between the intended time and the actual times at which participants logged on to their computers. For the actual times, we used the times specified by the computer's clock. The times the participants had listed themselves were only used when it became apparent that the computer's clock was set wrong to

begin with (2 participants in the goal intention condition, and two participants in the implementation intention condition).

As predicted, the participants in the implementation intention condition performed the four concentration tests in closer temporal proximity to the intended time ($M = 101.27$ min, SD = 153.80) than the participants in the goal intention condition ($M = 482.45$ min, SD = 903.06); $t(24) = 1.93$, $p < 0.05$ (one-tailed). The mean deviation from the intended point in time was more than five times as large in the goal intention condition (i.e., 8 h) as compared to the implementation intention condition (i.e., $1\frac{1}{2}$ h).

It appears then that goal intentions need to be furnished with implementation intentions if one wants to make sure that the goal is acted upon at the intended time. Simply specifying the when of acting on the goal within the framework of the respective goal intention fails to strongly link action initiation to intended times. Apparently, it is not having thought about an appropriate time of action on which the action initiation facilitating effects of implementation intentions are based. Rather, the spelling out of an if (i.e., anticipated critical situation)–then (i.e., goal-directed behavior) link and the associated commitment to perform goal-directed behaviors once the critical situation is encountered, seem to facilitate timely action initiation (see also Gollwitzer & Brandstätter, 1999, Study 3).

The specification of the goal intention as operationalized in the present study should not be confused with work on the goal specificity effect as exemplified by Locke and Latham's (1990) research on goals. In numerous experiments, Locke and Latham had their participants specify the outcome of an intended behavior in terms of a clear and challenging standard (e.g., "I will perform 20 tasks in 5 min"). As compared to goals with a challenging, but unspecified standard (so-called do-your-best-goals; e.g., "I will perform as many tasks as possible in 5 min") the former type of goals consistently produce better performances than the latter. In contrast, the present research focuses on getting started on a goal (i.e., action initiation) rather than on the outcome of goals. Accordingly, it is the when and where one intends to get started that is of concern. If these issues are specified in terms of an implementation intention rather than a goal intention, strong facilitative effects on action initiation can be observed.

Finally, one might ask whether committing oneself to specific plans on how to achieve one's goals facilitates goal attainment under all circumstances. Kirschenbaum (1987) suggests that spelling out every individual step of the course of goal pursuit may cause rigidity that hampers goal attainment when the latter requests flexibility. This risk seems to be minor with specific plans in the form of implementation intentions, however. Even though implementation intentions exactly specify the when and where of getting started with goal-directed behaviors, they leave unspecified how the individual may traverse the course of goal attainment once he or she has started to act on the goal.

6. General conclusion

Modern theories on goals include the claim that a person's behavior is not solely determined by the motivational variables of feasibility and desirability. The ways

people frame goals and how their goal pursuits are self-regulated are said to make an additional contribution. The present paper highlights the importance of self-regulatory strategies and suggests particularly effective self-regulatory strategies for goal setting and goal implementation (i.e., contrasting fantasies about a desired future with present reality and forming implementation intentions, respectively).

The present research on goal setting indicates that high expectations of success do not guarantee that students will set themselves binding academic goals (i.e., learning a foreign language) to be pursued with great effort and success. Rather, one's fantasies of excelling in speaking a foreign language need to be contrasted with relevant aspects of present reality so that the motivational variable of expectation of success (feasibility) becomes translated into action. Indulging in the desired future and dwelling on present reality, however, make high expectations of success lose their positive impact on effort and performance.

Our research also suggests that even when people feel highly committed to a goal, goal striving can be enhanced by the volitional strategy of forming implementation intentions. The academic task of composing a curriculum vitae was more reliably performed when implementation intentions specified when and where the person wanted to get started. Moreover, the facilitative effects of implementation intentions on getting started do not seem to be based on having specified a good opportunity to act. Rather, it is the volitional strategy of creating strong links between anticipated opportunities and goal-directed behaviors (i.e., forming if–then statements) that transfers the control of one's goal-directed actions to situational cues.

The reported findings have important implications for issues of motivation and volition in educational contexts. It is suggested that maximizing motivation via the many ways that have shown to be effective in raising the desirability and feasibility of academic learning and teaching (Covington, 1998) can only be a first step. The second step involves enhancement of volitional or self-regulatory skills and capabilities. Students and teachers should acquire knowledge about effective self-regulatory strategies of goal setting and goal implementation and learn when it is appropriate to use these strategies. Finally, as self-regulatory strategies are based on mental procedures that can be applied more or less skillfully, applying these strategies needs to be thoroughly practiced.

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Peter M. Gollwitzer holds the Social Psychology and Motivation Chair at the University of Konstanz (Germany). He received his Ph.D. from the University of Texas at Austin and headed the "Intention and Action" research group at the Max-Planck-Institute for Psychological Research in Munich from 1988 to 1992. His research interests include compensatory processes in the willful pursuit of identity, action phases and mind-sets, planning and the control of goal-directed behavior, and automatic goal pursuit.

Gaby Hönig received her M. S. in psychology from the Free University in Berlin in 1999. Her research interests center around motivation and learning. More specifically, she analyzes how cultural and societal factors influence the development of students' expectations and fantasies.

Gabriele Oettingen is an Associate Professor in the Department of Psychology, New York University (USA). She received her Ph.D. from the Max-Planck-Institute for Behavioral Psychology, Seewiesen, and the Medical Research Council, Cambridge. Her research interests include the development of efficacy beliefs across educational and cultural contexts and the self-regulation of goal setting and goal disengagement.