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Mental Contrasting and the Self-Regulation of Responding to Negative Feedback

Andreas Kappes¹, Gabriele Oettingen^{1,2}, and Hyeonju Pak¹

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Abstract

Mentally contrasting a desired future with impeding reality promotes goal pursuit when expectations of success are high and curbs goal pursuit when expectations of success are low. Four studies tested whether mental contrasting affects responses to goal-relevant negative feedback. Mental contrasting promoted the processing of negative feedback (Studies 1 and 2), which in turn helped participants to form plans beneficial for goal pursuit (Study 2). Mental contrasting also protected the self-view of competence against negative feedback (Study 3) and facilitated beneficial attributions for negative feedback (Study 4). All effects occurred in line with expectations of success. These results suggest that mental contrasting regulates effective responses to negative feedback by bringing goal pursuit in line with expectations of success.

Keywords

negative feedback, self-regulation, mental contrasting, expectations, goal commitment, goal pursuit

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Negative feedback is an inevitable part of goal pursuit, and learning from such feedback is crucial for success. Yet, negative feedback comes in many forms, which, in turn, impose different challenges. Confronted with negative feedback that contains information useful for goal pursuit (i.e., procedural feedback), people need to remember and utilize the negative information to promote success. Confronted with negative feedback comprising threatening information such as comparisons with others (i.e., normative feedback), people need to preserve their competence beliefs and optimistic future outlook. That is, effective responding to negative feedback during goal pursuit entails processing relevant information while staying confident about one's own competence and future performances. Research on responding to feedback has focused on relatively stable factors such as self-esteem (Di Paula & Campbell, 2002) or implicit theories (Nussbaum & Dweck, 2008), thereby identifying individuals who are likely to respond to negative feedback in ways that promote successful goal pursuit. Less is known about how self-regulatory strategies might help to effectively respond to negative feedback.

In this article, we propose that the self-regulatory strategy of mental contrasting supports effective responding to negative feedback. During mental contrasting, people first imagine a desired future (e.g., excelling on an exam) and then imagine the reality that stands in the way of reaching this desired future (e.g., being distracted). Thereby, mental contrasting leads people to differentiate in their goal commitments: When expectations of success are high, people

strongly commit to the desired future, and when expectations of success are low, people actively disengage from the desired future (e.g., Oettingen, Pak, & Schnetter, 2001, summary by Oettingen, 2012). We hypothesized that mental contrasting, by creating strong goal commitment, also affects responses to negative goal-relevant feedback.

Negative Feedback

Extracting information from negative *procedural* feedback during goal pursuit allows people to identify problems and adjust their behavior correspondingly (Audia & Locke, 2003). Thus, they can acquire abilities and skills of various kinds (Ball, Hoyle, & Towse, 2010; Nussbaum & Dweck, 2008). However, people often refrain from processing negative feedback because it is self-threatening. On the contrary, they readily process positive feedback because it is self-affirming (Sedikides & Green, 2009). For example, negative feedback rather than positive feedback that addresses important aspects of the self may be poorly remembered, even when the negative feedback is innocuous (Sedikides & Green, 2000; Studies 1 and 2).

¹University of Hamburg, Germany

²New York University, USA

Corresponding Author:

Andreas Kappes, New York University, 6 Washington Place, 7th Floor, New York, NY 10003, USA

Email: kappes.andreas@gmail.com

Similar principles apply to negative versus positive *normative* feedback. For example, negative normative feedback tends to decrease the self-view of competence, particularly after initial negative feedback (Nease, Mudgett, & Quinones, 1999) and strengthens the belief that goal achievement is beyond personal control (i.e., is externally controlled). Such decreased self-view and control beliefs in turn lower persistence in goal pursuit (e.g., Feather, 1968). Positive normative feedback, on the contrary, increases the self-view of competence (Bandura, 1997, for a summary) and strengthens the belief that goal achievement is under personal control (i.e., is internally controlled; Rotter, 1954). To summarize, negative normative feedback threatens a positive self-view of competence and the belief that goal achievement is under personal control, whereas positive normative feedback does not.

Changes in one's self-view and future outlook after negative normative feedback may result from how this feedback is attributed. The different lines of research on attributions agree that attributing negative feedback to stable and global factors (e.g., ability) hurts subsequent goal pursuit, whereas attributing negative feedback to unstable and specific factors (e.g., effort) supports subsequent goal pursuit (Gillham, Shatté, Reivich, & Seligman, 2001; Hong, Chiu, Dweck, Lin, & Wan, 1999). Hence, explaining normative negative feedback using unstable and specific attributions is beneficial for subsequent goal pursuit.

People differ in their responses to negative feedback. Research has identified characteristics of the feedback recipient (e.g., Ball et al., 2010; Di Paula & Campbell, 2002; Nussbaum & Dweck, 2008), of the source (e.g., Fedor, Davis, Maslyn, & Mathieson, 2001), and of the negative feedback itself (e.g., Butler, 2008) to explain the differences in responses. Comparatively little is known about the effects of more transient factors, such as self-regulatory strategies. As strong goal commitments support beneficial responses to negative feedback (e.g., Brunstein & Gollwitzer, 1996; Latham & Locke, 1991), we hypothesized that a self-regulatory strategy that instigates strong goal commitments should help people to respond effectively to negative feedback.

Mental Contrasting

The model of fantasy realization (Oettingen, 2000; 2012) identifies different modes of thinking about a desired future with different effects on goal commitment: mental contrasting, indulging, and dwelling. During mental contrasting, people first imagine a desired future, and then reflect on the reality that stands in the way of reaching this desired future. As a result, expectations of success guide goal commitments: When expectations are high, people commit to the desired future, and when expectations are low, people disengage from the desired future. For example, one might first

imagine the desired future of improving the relationship with one's partner, but then reflect on one's jealousy as standing in the way of an improved relationship. Thereby, the question of whether one can overcome one's jealousy is raised. Expectations of success provide the answer. With high expectations of success, because of previously mastering one's jealousy, strong goal commitments are formed. With low expectations of success, because of previously failing to master one's jealousy, no goal commitments are formed. However, when people merely imagine the desired future (i.e., indulging) or the reality (i.e., dwelling), expectations of success do not guide goal commitments and subsequent goal striving (i.e., goal pursuit). Indeed, indulging and dwelling do not raise the question of whether the reality can be overcome; thereby, they fail to activate expectations and leave preexisting commitments untouched, as if no self-regulatory strategy had been used (Oettingen, 2000).

A multitude of studies tested the effects of mental contrasting on goal commitment and subsequent performance. Measuring goal commitment with cognitive (e.g., making plans), affective (e.g., feelings of anticipated disappointment in case of failure), motivational (e.g., feelings of energization, systolic blood pressure), and behavioral indicators (e.g., invested effort and actual achievement), these studies found the same pattern of results, no matter whether these indicators were assessed via self-report or observations, directly after the experiment or weeks later (Oettingen, 2000; Oettingen et al., 2001, 2009; Oettingen, Mayer, Stephens, & Brinkmann, 2010; Oettingen, Mayer, & Thorpe, 2010; Oettingen, Mayer, Thorpe, Janetzke, & Lorenz, 2005). Given high expectations of success, participants in the mental contrasting condition showed strong goal commitments; given low expectations of success, they showed weak goal commitments or none at all. Participants in the indulging conditions and in the dwelling conditions showed intermediate commitments uncorrelated to their expectations of success.

Mental Contrasting and Negative Feedback

In light of its observed effects on goal commitment, we hypothesized that mental contrasting would aid effective responses to negative feedback (i.e., extracting information while protecting the self-view and future outlook). Specifically, mental contrasting establishes strong goal commitments in line with expectations of success—strong commitments in turn endow people with the determination to reach the goal, even when facing adversities such as negative feedback (Latham & Locke, 1991). For instance, Brunstein and Gollwitzer (1996) found that negative feedback relevant to participants' self-defining goals (i.e., goals they were committed to) led to enhanced performance on a subsequent task relevant to the same self-defining goals. Participants who were confronted with negative feedback

not relevant to their self-defining goals did not enhance their effort. These findings suggest that when people are committed to a goal, they may react with enhanced efforts after negative feedback.

Goal commitment may promote effective responses to negative feedback by preventing a shift in attention away from the task at hand. After receiving negative feedback, focusing attention on the task rather than on the implications for the self enables people to process the relevant information as well as to protect their competence beliefs (Dweck, 1999). Likewise, Kluger and DeNisi (1996) argued that when negative feedback guides attention away from the task toward the self, people neglect task-relevant information to focus on the implications of the feedback for the self, leading them to question their competence and their future outlook. However, strong goal commitments protect people from shifting attention away from the task. Mental contrasting, by establishing such goal commitments, could help people to process the useful information in procedural feedback and, at the same time, protect them from questioning their competence and future outlook when confronted with normative feedback.

Contrary to mental contrasting, one-sided modes of thinking about the future (i.e., indulging) or the reality (i.e., dwelling) should have less influence on responses to negative feedback. Neither indulging nor dwelling leads people to question whether they can attain the desired future. Therefore, they do not consult their expectations of success when pursuing their goals. As attainment is not questioned, negative feedback is not relevant, whether it is procedural or normative.

The Present Research

To test these ideas, we conducted four studies examining the effects of mental contrasting (vs. indulging or dwelling) on responses to negative feedback. In the first two studies, we delivered procedural feedback, and measured the degree to which it was processed, using cued recall (Study 1) and accessibility of the feedback (Study 2) as indicators. We also tested whether enhanced processing promoted subsequent goal pursuit (Study 2). In the next two studies, we delivered normative feedback, and measured the self-view of competence (Study 3) and attributions of the feedback (Study 4). We expected that mental contrasting (vs. indulging and dwelling) increases the recall (Study 1) and accessibility (Study 2) of information contained in negative feedback, in line with expectations of success; enhanced processing of this information should, in turn, foster the formation of plans beneficial for goal pursuit (Study 2). In spite of hypothesizing enhanced processing, we also predicted that mental contrasting would protect the self-view (Study 3), and increase beneficial attributions (Study 4), again in line with expectations of success.

Study 1: Recall of Negative Procedural Feedback

The study was presented as two supposedly independent studies, one examining problem solving, and the other one social competence. In the “first” study, we induced the three self-regulatory strategies (mental contrasting, indulging, and dwelling) and in the “second” study, participants received bogus positive and negative feedback on a social competence test. Finally, they were confronted with an unexpected cued recall test of the bogus feedback. As outlined above, we predicted that mental contrasting would promote the recall of the negative feedback, in line with expectations of success. However, mental contrasting should not differentially affect the recall of positive feedback; rather, all participants should readily process positive feedback due to its self-affirming content.

Method

Participants

One hundred fifty-three female students (age $M = 22.4$ years, $SD = 3.5$) participated in return for a compensation of 8 Euro (about US\$11). We randomly assigned students to a mental contrasting ($n = 52$), indulging ($n = 51$), or dwelling ($n = 50$) condition.

Procedure and Materials

Interpersonal problem and expectations of success. All students first named their currently most important interpersonal problem (e.g., “getting better along with my boyfriend,” “getting acquainted with my roommates”). For measuring expectations of success, students indicated how likely they thought it was that the named problem would have a happy ending on a scale ranging from 1 = *not at all* to 7 = *very*. Thereafter, all students listed four desired future aspects that they associated with their interpersonal problem having a happy ending (e.g., “not feeling lonely anymore,” “feeling more at home in my dorm”) and four reality aspects that could stand in the way of a happy ending (e.g., “being too emotional,” “feeling insecure”). Finally, students ranked the aspects of the desired future and reality in order of importance.

Induction of self-regulatory strategies. In the mental contrasting condition, students wrote about two desired future aspects and two impeding reality aspects in alternating order beginning with the second most important future aspect. For each of the four aspects, students read the following instructions:

Think about this aspect in vivid detail and write about all the thoughts and images that come to mind. Let your mind wander and allow these events and experiences to play out. Don't hesitate to give your thoughts and images free rein. Take as much time as you need.

Students in the indulging condition wrote about the four desired future aspects in the order of their importance, beginning with the least important future aspect. Students in the dwelling condition wrote about the four impeding reality aspects, beginning with the least important reality aspect.

Social competence test. Students then received a bogus social competence test on the computer. Specifically, we used four ambiguous pictures of the Thematic Apperception Test (Murray, 1938). The first picture depicted a young woman looking into the distance. Students estimated her personality using six semantic differential scales (e.g., weak vs. strong). The second picture showed a landscape and students indicated how the landscape made them feel using again six semantic differential scales (e.g., active vs. passive). The third picture presented a hugging couple and participants estimated how long the couple had known each other. The last picture displayed a man standing at an open window and students provided an open-ended description of what this man would do in the next 5 min. Students viewed each image for 1 min before answering the respective questions. Thereafter, to make the feedback more credible, students learned that the computer now needed time to score their answers and thus were asked to solve arithmetic tasks. Five minutes later, each student received the identical bogus feedback.

Social competence feedback. The feedback consisted of 12 statements: Three gave negative feedback, three gave positive feedback, and six statements were irrelevant distractors. The statements were presented one at a time for 12 s each on the computer screen. The three negative feedback statements described a weakness in a specific social situation: “In socially challenging situations, you feel *overwhelmed*,” “When meeting other people, you are *hesitant*,” and “In socially stressful situations, you react *impulsively*.” The three statements providing positive feedback described strength in a specific social situation: “In encounters with others, you are *tolerant*,” “In interpersonal relationships, you are *open minded*,” and “When you meet others, you are *happy*.” Participants studied the list of feedback statements without knowing that a cued recall test would follow. The adjectives included in the positive and negative feedback did not differ in word length or frequency.

Cued recall. At the end of the experiment, all students were given an unexpected cued recall test. Students saw the context information of the provided feedback (e.g., “In socially challenging situations, you feel . . .”) and had to recall the corresponding adjectives. As dependent variable, we counted the number of correctly recalled positive and negative adjectives.

Order of feedback. Half of the participants started with the self-regulatory strategy manipulation and then received the bogus feedback; the other half did the experiment in the reverse order. At the end, participants were carefully debriefed.

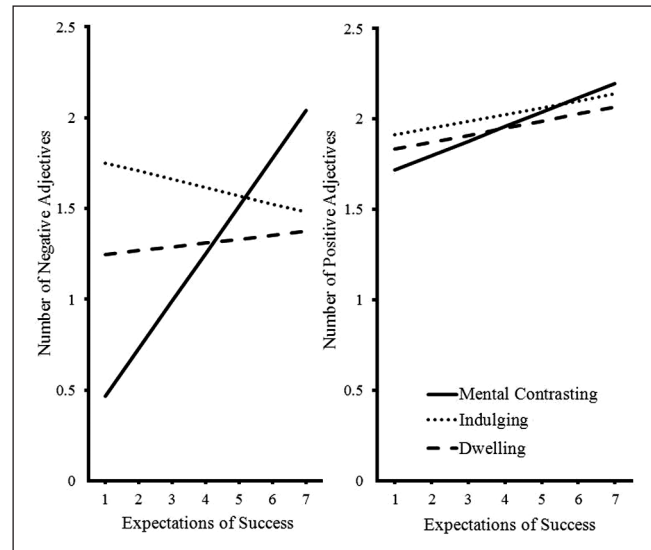


Figure 1. Regression lines depict the link between expectations of success and recall of negative adjectives (left) and recall of positive adjectives (right) as a function of self-regulatory thought

Results

Recall of Negative Versus Positive Feedback

We first tested whether negative feedback was more difficult to remember than positive feedback. Consistent with previous research (Sedikides & Green, 2000), participants recalled more positive feedback adjectives ($M = 2.00$, $SD = 0.78$) than negative feedback adjectives ($M = 1.48$, $SD = 0.92$), $t(153) = 6.23$, $p < .001$. We then tested our hypothesis that the effects of self-regulatory strategies on recall would differ for negative versus positive feedback. We used generalized estimating equations (Schafer, 2006) to account for within-subject correlations between recall of positive and negative feedback; predictors were condition, expectations, type of feedback, and all two- and three-way interactions; the dependent variable was cued recall of feedback. We found the predicted three-way interaction effect, $\chi^2(1) = 2.97$, $p < .05$, indicating that the expectancy-dependent effects of the self-regulatory strategies differed for cued recall of negative and positive feedback. Consequently, we analyzed the interaction of expectations of success and self-regulatory strategies on recall of feedback separately for negative and positive feedback.

Recall of negative feedback. Using hierarchical regression analysis predicting the recall of negative feedback, we entered two dummy codes for the three conditions and expectations of success in the first step, and the two interaction terms between conditions and expectations in the second step. As hypothesized, adding the interaction terms improved the model, $R^2_{\text{change}} = 4\%$, $F_{\text{change}}(2, 147) = 3.16$, $p = .04$ (see Figure 1). In the mental contrasting condition, the higher were expectations of success, the more negative feedback was recalled, $\beta = .38$, $t(147) = 3.23$, $p = .002$. There was no

relationship between expectations and recall of negative feedback in the indulging condition, $\beta = -.07$, $t(147) = 0.42$, $p = .67$, or in the dwelling condition, $\beta = .03$, $t(147) = 0.21$, $p = .84$. Accordingly, the relationship between expectations and recall of negative feedback was stronger in the mental contrasting condition than in the indulging condition, $t(147) = 2.27$, $p = .03$, and it was marginally stronger than in the dwelling condition, $t(147) = 1.86$, $p = .06$, whereas the relationship did not differ between the indulging and dwelling conditions, $t(147) = 0.48$, $p = .65$.

Recall of positive feedback. We used the same hierarchical regression analysis for predicting recall of positive feedback. However, adding the interaction terms did not improve the model, $F_{\text{change}}(2, 147) = 0.09$, $p = .91$ (see Figure 1), and there was neither a main effect for expectations, $t(147) = 0.10$, $p = .89$, nor interaction effects between conditions and expectations, $ts > 0.35$, $ps < .72$.

Order of feedback. Finally, we tested whether inducing the self-regulatory strategies before or after the negative feedback had an effect on the recall of negative or positive feedback. Using the same hierarchical regression analyses as above, we added order as an additional predictor, all the two-way interactions between order, conditions, and expectations in the second step, and the three-way interactions between order, conditions, and expectations in the third step. Adding the three-way interaction terms did not improve the models predicting recall of either negative or positive feedback, $F_{\text{change}}s > 0.49$, $ps < .61$, and none of the three-way interaction effects were significant, $ts > 0.83$, $ps < .41$. These results suggest that mental contrasting affects encoding (i.e., mental contrasting induced before the feedback) and retrieval processes (i.e., mental contrasting induced after the feedback) of negative feedback.

Discussion

Mental contrasting promoted the processing of negative feedback: Students in the mental contrasting condition recalled negative feedback in line with their expectations of success, whereas students in the indulging or dwelling condition recalled negative feedback at an intermediate level, independent of their expectations of success. In line with previous research (Sedikides & Green, 2009), positive feedback was better recalled than negative feedback; but the self-regulatory strategies did not differentially affect recall of positive feedback. Only negative feedback, which is reluctantly processed (Sedikides & Green, 2009), was differentially affected by mental contrasting versus indulging and dwelling. The findings of Study 1 support the idea that mental contrasting helps people to gain goal-relevant knowledge from negative feedback. In turn, this knowledge should help them to better plan and perform more successfully. Hence, we tested whether the processed information helps with goal pursuit by furthering the formation of goal-relevant plans.

Study 2: Processing of Negative Feedback and Planning

We invited students to a study about problem solving in teams. Students first participated in a team task, and then received feedback, supposedly from their team members. Thereafter, we measured the accessibility of the negative (vs. positive) feedback as an indicator of the processing of feedback, and then measured plan formation. Particularly, we measured whether students formed specific plans (Oettingen et al., 2001) because such plans facilitate successful goal pursuit (Gollwitzer, 1999). Negative feedback may contain information about potential problems and obstacles impeding goal attainment; such information lends itself to the formation of plans addressing these concerns. We predicted that students in the mental contrasting condition would process the negative feedback in line with their expectations of success, and such enhanced processing would in turn foster the formation of specific plans.

Method

Participants

Seventy-five students (49 female, age $M = 19.76$ years, $SD = 2.03$) participated in return for partial course credit. We randomly assigned students to a mental contrasting ($n = 24$), indulging ($n = 24$), or dwelling ($n = 27$) condition.

Procedure and Materials

Students were tested in groups of four. They first saw a computer presentation about the importance of problem solving in teams. Excelling at problem solving in teams was depicted as a skill critical for people's success in their careers. Thereafter, students learned that they would participate in a team problem-solving task. To measure expectations of success, students answered the question "How likely is it that you will excel at problem solving in teams?" on a scale ranging from 1 = *not at all* to 7 = *very*. Students then listed four future aspects that they associated with their successfully excelling at problem solving in teams and four reality aspects that stood in the way of excelling at their problem solving in teams. Finally, we established the three experimental conditions (i.e., mental contrasting, indulging, and dwelling) in the same way as in Study 1.

Team task. Next, the four students were introduced to each other and to the team project called "Lost at Sea," a team game widely used in management training (Nemiroff & Pasmore, 1975). This game presents a hypothetical scenario where a plane crashes in the middle of the ocean and the team members are stranded on a raft. Ten items (e.g., shaving mirror, sextant, U.S. Army rations) are at the team members' disposal for survival. Each team member first ranks the items regarding personal importance for survival the most important received a 1, the least important a 10. Thereafter, the team members are working together to find consensus on the

importance rankings for each item. In our study, students had 5 min to rank their items on their own and up to 15 min to rank the items as a team.

Feedback. Students learned before the team task that they would be asked to provide feedback on their teammates' performance. For this reason, every student's identity was disguised by being assigned a letter (e.g., Student A) so that they could give feedback while remaining anonymous. After the team task, students were brought into separate cubicles where they provided anonymous feedback for each of the other three participants. They were prompted to write two *positive* feedback statements about each of their three peers by completing two sentence stems: "Student A: With regard to excelling at team problem solving, one thing you do well and should continue to do in the future is . . ." Similarly, participants were prompted to write two *negative* feedback statements about each of their three peers: "Student A: With regards to excelling at team problem solving, one thing you do *not* do well and should work on in the future is . . ." Finally, to obtain irrelevant positive and negative statements, students were prompted to provide two positive (negative) feedback statements for themselves: "With regards to excelling at team problem solving, one thing I do (not do) well and should continue to do (work on) is . . ."

Thereafter, students had to wait for several minutes in their cubicles for the experimenter who pretended to prepare individual feedback forms for every student. However, instead of actually receiving what their fellow students wrote about them, each student received the same standardized feedback. Specifically, they received four positive feedback statements (e.g., being creative, being respectful), four negative feedback statements (e.g., have more confidence, give more compliments), and two positive as well as two negative irrelevant statements which the other students supposedly wrote about themselves (e.g., being rational, be less argumentative). The statements provided the words for our measure of feedback accessibility. Every student had 5 min to read the statements.

Dependent Variables

Processing of feedback. Next, students performed a lexical decision task that measured the accessibility of the feedback. Here, students indicated as quickly as possible whether each string of letters presented on the screen was a word or a nonword by pressing one of two labeled keys. The complete lexical decision task comprised two blocks with 48 trials each. On these 48 trials, we presented 24 nonwords and 24 words. Of these 24 words, we presented the keywords of each of the four negative feedback statements, the four positive feedback statements, and the four irrelevant statements, as well as 12 unrelated words. The different types of keywords did not differ in length or frequency. Every keyword was presented twice during the lexical decision task. The mean reaction times for positive and negative feedback trials served as an indicator for the accessibility of the respective feedback.

Planning. Following Oettingen et al. (2001), we measured the formation of plans by providing eight sentence stems and asked students first to carefully read and then complete the four sentence stems—and only those four—that best matched how they thought about excelling at team problem solving. We included in random order four sentence stems suggesting plan formation (e.g., If . . . then I will . . .) and four sentence stems suggesting no plan formation (e.g., In general . . .). We counted the number of sentence stems suggesting plan formation as our dependent variable.

Results

Negative Versus Positive Feedback

First, we compared the accessibility of the negative feedback with the accessibility of the positive feedback, independent of experimental conditions. We adjusted for the reaction times on neutral trials, thereby controlling for individual differences in reaction times (Ferguson, 2007). In line with previous research (e.g., Sedikides & Green, 2009), reaction times on negative feedback trials were on average 73 ms slower than reaction times on positive feedback trials, $F(1, 64) = 4.03, p = .04$, suggesting that the processing of negative feedback was more difficult than the processing of positive feedback.

We then tested our hypothesis that the effects of condition and expectations on accessibility would differ for negative versus positive feedback. Using generalized estimating equations, we specified as independent variables condition, expectations, type of feedback, and all two- and three-way interactions; the dependent variable was accessibility of feedback. We found a marginally significant three-way interaction effect, $\chi^2(1) = 5.20, p = .07$, indicating that the effects of self-regulatory strategies differed for accessibility of negative and positive feedback.

Accessibility of negative feedback. In a hierarchical regression analysis predicting the accessibility of negative feedback, we entered reaction times on neutral trials, two dummy codes for the three conditions, and expectations of success in the first step, and the two interaction terms between conditions and expectations in the second step. Adding the interaction terms improved the model, $R^2_{\text{change}} = 5\%$, $F_{\text{change}}(2, 67) = 5.12, p = .009$ (see Figure 2). In the mental contrasting condition, the higher were expectations of success, the more accessible was the negative feedback, indicated by faster reaction times, $\beta = -.38, t(67) = 2.65, p = .01$. There was no relationship between expectations and accessibility of negative feedback in the indulging condition, $\beta = .15, t(67) = 1.30, p = .20$, or in the dwelling condition, $\beta = .20, t(67) = 1.59, p = .12$. That is, the relationship between expectations and accessibility of negative feedback was stronger in the mental contrasting condition than in the indulging condition, $t(67) = 2.86, p = .006$, and in the dwelling condition, $t(67) = 3.55, p = .01$, whereas the relationship did not differ between the indulging and dwelling conditions, $t(67) = 0.23, p = .81$.

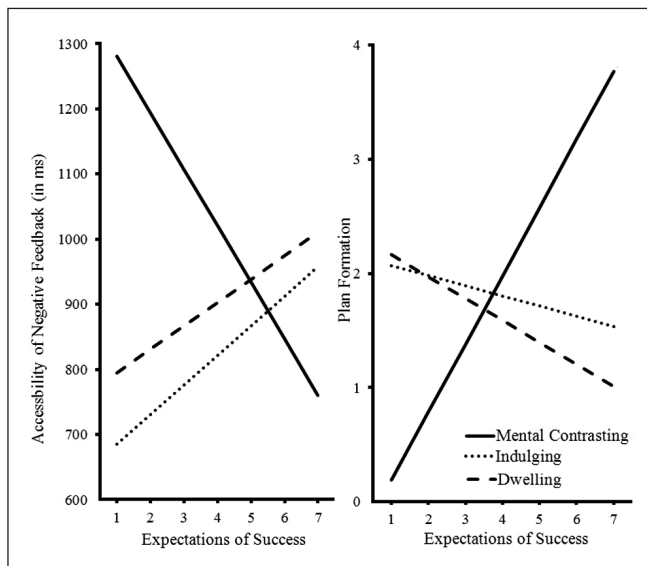


Figure 2. Regression lines depict the link between expectations of success and accessibility of negative feedback (left) and plan formation (right) as a function of self-regulatory thought

Accessibility of positive feedback. We used the same hierarchical regression analysis to predict the accessibility of positive feedback. Adding the interaction terms did not improve the model, $F_{\text{change}}(2, 67) = 1.73, p = .19$, and there was neither a main effect for expectations, $t(67) = 0.68, p = .50$, nor interaction effects between expectations and conditions, $t_s > 1.60, p_s < .12$.

Negative versus positive irrelevant statements. We used the same set of analyses to predict the accessibility of the negative and positive irrelevant statements. Again, adding the interaction terms did not improve the model, $F_{\text{change}}(2, 67) = 1.81, p = .15$ and there were neither main effects for expectations, $t_s > 0.53, p_s < .59$, nor interaction effects between expectations and conditions, $t_s > 1.44, p_s < .15$.

Plan formation. We used the same set of analysis to predict plan formation. Here, adding the interaction terms improved the model, $R^2_{\text{change}} = 7\%, F_{\text{change}}(2, 69) = 3.06, p = .05$ (Figure 2). In the mental contrasting condition, the higher were expectations of success, the more plans were formed, $\beta = .52, t(69) = 2.29, p = .03$. There was no relationship between expectations and plan formation in the indulging condition, $\beta = -.17, t(69) = 0.87, p = .39$, or in the dwelling condition, $\beta = -.08, t(67) = 0.47, p = .64$. Accordingly, the relationship between expectations and plan formation was stronger in the mental contrasting condition than in the indulging condition, $t(69) = 2.30, p = .02$, and in the dwelling condition, $t(69) = 2.12, p = .04$, whereas the relationship did not differ between the indulging and dwelling conditions, $t(69) = 0.36, p = .72$.

Mediation. Finally, we tested whether the difference in expectancy-dependent plan formation between the conditions was mediated by the processing of negative feedback. Describing the analysis of such a moderated mediation, Muller, Judd, and Yzerbyt (2005) call for predicting the

dependent variable (plan formation) with a model that includes the independent variables (conditions), the moderator (expectations), their interaction terms, the mediator (accessibility of negative feedback), and the moderator–mediator interaction term (expectations by accessibility of negative feedback). The coefficient for the condition by expectations interaction in this model should be compared with the coefficient for the condition by expectations interaction from the model that predicted plan formation without the mediator and its interactions. Note that no formal test for the difference is necessary (see also Preacher, Rucker, & Hayes, 2007).

We found a smaller condition by expectations interaction effect for the comparison of mental contrasting with the indulging condition, $\beta = -.33$, than that in the initial model, $\beta = -.37$, and the interaction was not significant anymore, $t(65) = 1.67, p = .10$. Furthermore, we found a smaller condition by expectations interaction effect for the comparison of mental contrasting with the dwelling condition, $\beta = -.28$, than that in the initial model, $\beta = -.40$, and the interaction was not significant anymore, $t(65) = 1.52, p = .13$. These results indicate that the difference between the mental contrasting and the indulging conditions as well as between the mental contrasting and the dwelling conditions regarding the relationship between expectations and plan formation was at least partially mediated by the accessibility of the negative feedback.

Discussion

Mental contrasting furthered the processing of negative feedback, measured via accessibility, as well as the formation of plans; both effects occurred in line with expectations of success. Indulging and dwelling led to moderate processing of negative feedback, and a moderate formation of plans, unrelated to expectations of success. Importantly, the different effects of the conditions on the formation of plans were mediated by the difference in accessibility of the negative feedback. Furthermore, we again found that mental contrasting did not affect the processing of positive feedback; rather, regardless of self-regulatory thought, all participants processed positive feedback better than negative feedback. Finally, mental contrasting did not affect the processing of irrelevant statements, no matter whether they were negative or positive, suggesting that mental contrasting attunes participants not merely to valence but to goal-relevant content. Together, Studies 1 and 2 indicate that mental contrasting furthers the processing of information that is relevant and difficult to process (i.e., negative feedback).

However, the enhanced processing of negative feedback might backfire when one is confronted with negative *normative* feedback (e.g., one's test score is well below the average of one's peer group). Such negative feedback may diminish the self-view of competence because it unambiguously points to low competence, whereas negative nonnormative

feedback (e.g., your test score is 18 out of 60) leaves more ambiguity for interpretation (Butler, 2000). Therefore, a critical test is whether mental contrasting enables people to protect their self-view of competence when faced with negative feedback that compares them against their peers.

Study 3: Protecting Self-View of Competence From Negative Normative Feedback

The procedure of Study 3 was similar to that of Study 1. This time, however, the negative feedback entailed an unfavorable social comparison with one's peer group (i.e., normative feedback). We confronted students only with negative feedback because positive feedback does not pose a threat to the self-view of competence (Sedikides & Green, 2009). We hypothesized that mental contrasting would shelter participants' self-view of competence in line with their expectations of success by keeping them task oriented, distracting them from making inferences for their self-view. Participants' self-view in the indulging or dwelling condition should stay unaffected by the negative feedback, irrespective of their expectations of success. As they do not question whether the desired future can be attained, they should not see the feedback as particularly relevant.

Method

Participants

A total of 60 female students (age $M = 19.76$ years, $SD = 2.03$) participated in return for 5 Euro (about US\$7). We randomly assigned students to a mental contrasting ($n = 20$), indulging ($n = 21$), or dwelling ($n = 19$) condition.

Procedure and Materials

We invited participants to two supposedly independent studies, a questionnaire study and a social competence study. All participants first named their most important interpersonal problem and indicated their expectations of successfully solving it. We used the same questions and scales as in Study 1. Participants then listed four future aspects that they associated with their interpersonal problem having a happy ending and four reality aspects that may stand in the way.

Participants then moved on to the supposedly second experiment in which they received the same bogus social competence test as in Study 1. However, instead of giving all participants procedural feedback, we now provided only negative normative feedback, which was presented for 90 s on the computer screen. Participants read the following:

Your test score of social competence is at 18 points total (0 = lowest to 60 = highest). This test score is on a very low level in comparison with the female

population (age range: 20 to 35 years). Persons with comparable results show mostly unhappy and disharmonious interpersonal relations.

Then, we established the three experimental conditions (i.e., mental contrasting, indulging, and dwelling) in the same way as before.

Self-view of social competence. To measure the self-view of social competence, participants were requested to estimate their social competence on a 10-cm line and their social intelligence on a scale from 0 to 100. They completed these ratings twice, once in the beginning of the experiment and once at the end of the experiment. The two items were combined to one measure of self-view of competence (before the feedback: Cronbach's $\alpha = .60$; after the feedback: Cronbach's $\alpha = .77$).

Results

We hypothesized that after receiving negative feedback, participants' self-view of competence in the mental contrasting condition would be protected in line with their expectations of success. We used hierarchical regression analysis, predicting the self-view of competence after negative feedback, and entered self-view of competence before the negative feedback, two dummy codes for the three conditions and expectations of success in the first step, and the two interaction terms between conditions and expectations in the second step. As predicted, adding the interaction terms improved the model, $F_{\text{change}}(2, 54) = 3.39$, $p = .04$ (see Figure 3). In the mental contrasting condition, the higher were expectations of success, the higher was the self-view of competence after negative feedback, $\beta = .55$, $t(54) = 2.72$, $p = .009$. There was no relationship between expectations and self-view of competence after negative feedback in the indulging condition, $\beta = -.05$, $t(54) = 0.35$, $p = .73$, or in the dwelling condition, $\beta = -.03$, $t(54) = 0.12$, $p = .55$. Accordingly, the relationship between expectations and self-view of competence after negative feedback was stronger in the mental contrasting condition than in the indulging condition, $t(54) = 2.41$, $p = .02$, and in the dwelling condition, $t(54) = 2.29$, $p = .03$, whereas the relationship did not differ between the indulging and dwelling conditions, $t(54) = 0.01$, $p = .92$.

Discussion

Despite receiving unambiguous negative normative feedback on their social competence, participants in the mental contrasting condition maintained a strong sense of competence, in line with their expectations of success. In combination with the results of the first two studies, the findings suggest that despite processing the negative feedback, mental contrasting participants were sheltered from its detrimental

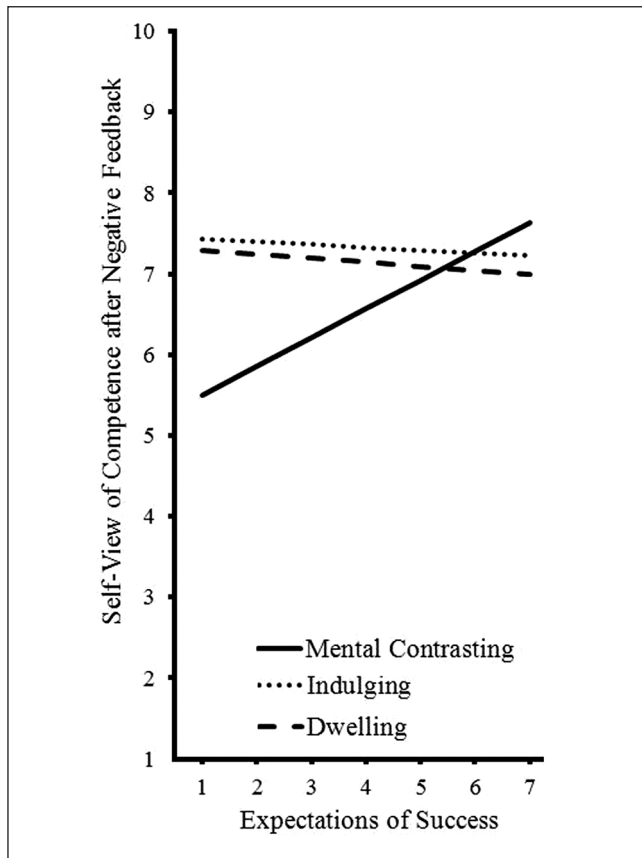


Figure 3. Regression lines depict the link between expectations of success and self-view of competence after negative feedback as a function of self-regulatory thought

consequences, in line with their expectations of success. Participants in the indulging and dwelling conditions were apparently insensitive to the negative feedback (as in Studies 1 and 2) and, hence, kept their self-view of competence regardless of expectations of success.

A positive self-view of competence is beneficial for cognition (e.g., planning, reasoning) and behavior (persistence, effort, successful performance) during goal pursuit (see Judge, 2009, for an overview). Beyond extracting critical information that aids in plan formation, protecting one's self-view appears to be another way that mental contrasting furthers effective responding to negative feedback. However, negative feedback has consequences beyond how people make their plans and judge their competence: The way they explain the feedback itself also has effects. Thus, in the final study, we tested how mental contrasting affects attributions for negative feedback. Mental contrasting should keep people task oriented after negative feedback, which in turn should promote explaining negative feedback using optimistic and malleable causes rather than pessimistic and stable causes (Abramson, Seligman, & Teasdale, 1978; Dweck, 1999).

Study 4: Attributions for Negative Feedback

We used the same procedures as in Study 3, this time using two measures of attributions as dependent variables. Our first measure was guided by the reformulation of the learned helplessness theory of depression (Abramson et al., 1978; Peterson, Maier, & Seligman, 1993; Peterson & Steen, 2009). The theory assumes that negative feedback can be explained by causes that are either unstable or stable over time, specific to a particular situation or global across situations, and external or internal. Attributing negative feedback to unstable, specific, and external causes (i.e., optimistic attributions) leads to expecting comparatively fewer negative events in the future and across situations as well as to a robust self-esteem. Because participants explaining negative feedback by such optimistic attributions should invest in the future, we used optimistic attributions as our first dependent measure.

Hong and colleagues (1999) identified effort attributions, rather than ability attributions, as particularly helpful for subsequent goal striving. Specifically, effort attributions predicted whether participants took actions after negative feedback to improve future performance (Hong et al., 1999; Study 3; see also McClure et al., 2010). Thus, effort attributions were our second dependent measure. We predicted that mental contrasting would foster optimistic and effort attributions for negative feedback, in line with expectations of success.

Method

Participants

A total of 115 students (70 female, age $M = 26.5$ years, $SD = 6.41$) participated in return for partial course credit. We randomly assigned students to a mental contrasting ($n = 41$), indulging ($n = 36$), or dwelling ($n = 38$) condition.

Procedure and Materials

As in Study 3, we invited participants to two supposedly independent studies, a questionnaire study and a social competence study. All participants first named their most important interpersonal problem and indicated their expectations of successfully solving the interpersonal problem. We used the same questions and scales as above and established the three experimental conditions in the same way as previously described. Afterward, students completed the same social competence test and received the same negative normative feedback as in Study 3.

Optimistic attributions. Thereafter, participants' attributions were measured with a three-item questionnaire, modeled after the attributional style questionnaire (ASQ; Peterson et al., 1982). Participants rated whether they thought their performance was caused by something permanent versus temporary (i.e., stable–unstable dimension),

something across many situations versus only pertaining to one situation (i.e., global-specific dimension), and something reflecting their own person versus the context (i.e., internal-external dimension). Following Peterson et al. (1982), answers were transformed into an overall index for explanatory pattern with high values representing optimistic attributions (unstable-specific-external) and low values representing pessimistic attributions (stable-global-internal).

Effort attributions. Finally, to measure effort attributions for the negative feedback, we used the procedure of Hong et al. (1999). Participants answered the question "What factors do you believe influenced your performance on the test the most?" by indicating how important four factors were for their success: ability, effort, luck, and skill. Students learned that they should assign each of the factors a weight score, such that the total weights assigned would equal 100. Following Hong and colleagues (1999), the measure of effort attributions was how much weight participants assigned to effort, and the measure of ability attributions was how much weight participants assigned to ability. The other two factors (i.e., luck, skill) were included to make the target attributions less obvious.

Results

Optimistic explanatory pattern. We predicted that participants in the mental contrasting condition would show optimistic explanations of their negative feedback in line with their expectations of success. To test this hypothesis, we used hierarchical regression analysis predicting optimistic attributions. We entered two dummy codes for the three conditions and expectations of success in the first step and the two interaction terms between conditions and expectations in the second step. Adding the interaction terms improved the model, $R^2_{\text{change}} = 5\%$, $F_{\text{change}}(2, 108) = 3.11$, $p = .05$ (Figure 4). In the mental contrasting condition, the higher were expectations of success, the more optimistic were participants' attributions of the negative feedback, $\beta = .39$, $t(108) = 2.03$, $p = .04$. There was no relationship between expectations and optimistic attributions in the indulging condition, $\beta = .14$, $t(108) = 0.88$, $p = .40$, or in the dwelling condition, $\beta = .17$, $t(108) = 1.25$, $p = .22$. Accordingly, the relationship between expectations and optimistic attributions was stronger in the mental contrasting condition than in the indulging condition, $t(108) = 2.08$, $p = .04$, and in the dwelling condition, $t(108) = 2.36$, $p = .02$, whereas the relationship did not differ between the indulging and dwelling conditions, $t(108) = 0.15$, $p = .88$.

Effort attributions. Next, we used the same set of analyses to test whether mental contrasting participants used effort attributions after negative feedback in line with expectations of success. Again, adding the interaction terms improved the model, $R^2_{\text{change}} = 5\%$, $F_{\text{change}}(2, 108) = 2.95$, $p = .05$ (see

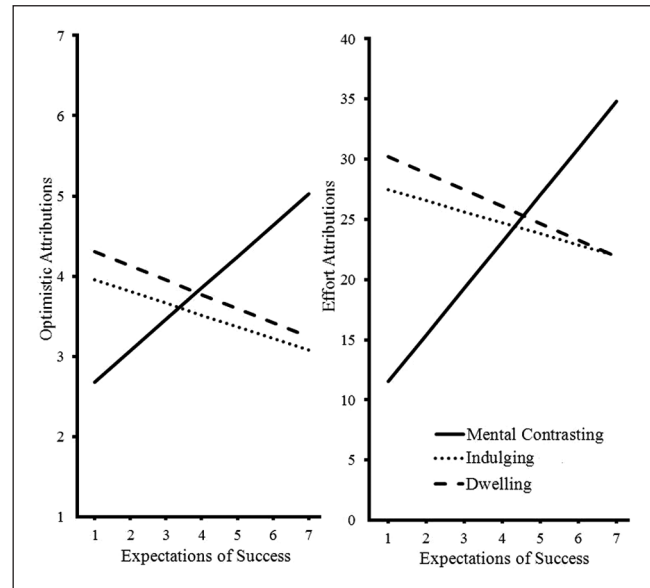


Figure 4. Regression lines depict the link between expectations of success and optimistic attributions (left) and effort attributions (right) as a function of self-regulatory thought

Figure 4). In the mental contrasting condition, the higher were expectations of success, the more weight participants assigned to effort in their explanations of the negative feedback, $\beta = .41$, $t(108) = 2.13$, $p = .04$. There was no relationship between expectations and effort attributions in the indulging condition, $\beta = -.10$, $t(108) = 0.55$, $p = .58$, or in the dwelling condition, $\beta = -.15$, $t(108) = 1.02$, $p = .30$. The relationship between expectations and effort attributions tended to be stronger in the mental contrasting condition than in the indulging condition, $t(108) = 1.95$, $p = .06$, and was stronger than in the dwelling condition, $t(108) = 2.32$, $p = .02$, whereas the relationship did not differ between the indulging and dwelling conditions, $t(108) = 0.22$, $p = .82$. We did not find interaction effects between conditions and expectations on the weight participants assigned to ability as explanation for the negative feedback, $t_s > 1.11$, $p_s < .26$.

Discussion

Mental contrasting participants used optimistic and effort attributions to explain their negative normative feedback, in line with their expectations of success. When perceived chances of success are promising, mental contrasting seems to protect individuals against the detrimental consequences of negative normative feedback by helping them conclude that the negative feedback is relatively transient and specific to this particular situation. Participants' attributions in the indulging or the dwelling condition were not in line with expectations of success. Because optimistic and effort attributions have been

linked to actions beneficial for goal pursuit (Gillham et al., 2001; Hong et al., 1999), these results underscore the idea that mental contrasting enables people to benefit from negative feedback when pursuing their goals.

General Discussion

Four studies showed that mentally contrasting a desired future with the impeding reality enables people to effectively respond to negative feedback in line with expectations of success. Specifically, mental contrasting promoted the processing of negative procedural feedback (Studies 1 and 2), and this enhanced information processing in turn helped participants to form plans beneficial for goal pursuit (Study 2). Furthermore, mental contrasting protected the self-view of competence against negative feedback (Study 3) and enhanced optimistic as well as effort attributions of negative feedback (Study 4) in line with expectations of success. Thus, adding to past research, we showed that mental contrasting supports goal pursuit in the face of setbacks. When prospects are promising, individuals process the useful information contained in negative feedback and use it for plan formation; at the same time, they protect their sense of competence and explain negative feedback in ways beneficial for subsequent goal pursuit. However, when prospects are grim, mental contrasting decreases the processing of negative feedback, as well as the self-view of competence and future outlook. Thereby, people may let go unpromising goal pursuit, which should free them for pursuing more feasible alternative goals.

Participants who indulged in the desired future or dwelled on the reality were not guided by expectations of success when responding to negative feedback; rather, they were insensitive to negative feedback whether or not they perceived their goal pursuit as feasible. As expectations of success build on a person's past experiences and performances (Bandura, 1997; Mischel, 1973), they provide a reliable foundation for determining in which endeavors a person should invest resources. One-sided views on the future (i.e., indulging) or on the reality (i.e., dwelling) lead to what Lewin (1935) called *ahistoric behavior*, creating the risk of missing out on attaining feasible futures and wasting resources on pursuing unfeasible futures.

That is, in the mental contrasting condition, the lower the expectations of success, the lesser the negative feedback participants processed (Studies 1 and 2). One might argue that low expectations for a desired future may be linked to low self-esteem or depressive symptoms, both of which have been shown to affect the processing of negative feedback (e.g., Swann, Chang-Schneider, & McClarty, 2007). Interestingly however, depressive symptoms are related to an *enhanced* rather than decreased processing of negative information about the self and the future (e.g., Andersen & Miranda, 2006; Taylor & Brown, 1988). Thus, it seems unlikely that mental contrasting effects for

participants with low expectations of success can be explained by processes related to depression.

One might further ask why mental contrasting did not affect the processing of positive feedback, which may also be relevant for goal pursuit. In the present studies, mental contrasting did not affect the processing of positive feedback (Studies 1 and 2). However, positive feedback is readily processed, even without a self-regulation strategy, due to its self-affirming content (e.g., Sedikides & Green, 2000). Accordingly, participants in the present studies remembered positive feedback better than negative feedback (Study 1), and positive feedback was more accessible to them than negative feedback (Study 2). These findings suggest that no extra help is needed for the processing of positive feedback. Self-regulation in the form of mental contrasting showed its effects on the feedback that people feel reluctant to process, that is, on negative feedback.

Finally, why did the combination of indulging and negative feedback not yield responses to negative feedback in line with expectations? After all, participants in the indulging condition first thought about the desired future and later on were confronted with the reality (i.e., negative feedback). There are several reasons why the combination of indulging and negative feedback should be different from mental contrasting and thereby fails to bring responses to negative feedback in line with expectations. First, feedback pertains to how well a person has performed in the past, while potential obstacles of reality—as used in mental contrasting—are anticipated hindrances to fulfilling one's wishes or resolving one's concerns. Second, in mental contrasting, the future and the reality are mentally elaborated rather than just brought to mind. It is the mental elaboration of future and reality that produces expectancy-dependent effects (e.g., Oettingen et al., 2001; Study 3 Oettingen, 2012). In the indulging condition, to the contrary, the negative feedback was not mentally elaborated. Third, in the indulging condition, there was a time lag between mental elaboration of the future and the receiving of the negative feedback. Specifically, students first imagined the desired future, thereafter worked on the social competence test (Studies 1, 3, and 4) or the team task (Study 2), then did a filler task, and finally, received negative feedback. Hence, the indulging and the mental contrasting conditions differ in the time that passed between the mental elaboration of the desired future and the onset of the reality. Whereas in the mental contrasting condition, the impeding reality was elaborated while the desired future was still on participants' minds, in the indulging condition, participants were confronted with the factual feedback at a much later point in time when the desired future may have not been on their mind anymore. Finally, feedback works via discrepancy reduction (Bandura & Cervone, 1983), and indulging does not provide a standard or goal yet with respect to which a person experiences a discrepancy that he or she then sets out to reduce. The standard or goal is only emerging after mental contrasting with high expectations.

Implications for Research on Mental Contrasting

Previous research analyzed mental contrasting effects on goal commitment and performance (summary by Oettingen, 2012). We found that mental contrasting strengthens the pursuit of feasible goals (i.e., high expectations of success) even when a person is confronted with adversity such as negative feedback. When expectations of reaching a desired future are high, mental contrasting prepares people to handle such aversive setbacks; when expectations are low, mental contrasting revokes people from handling the setbacks thereby furthering disengagement from goal pursuit. Shaping responses to negative feedback appears to be one way that mental contrasting brings goal pursuit in line with one's expectations of success.

Negative feedback, in turn, might be a facilitator of mental contrasting. Recent research showed that sad moods ready people to self-initiate mental contrasting (Kappes, Oettingen, Mayer, & Maglio, 2011). In one study, participants receiving feedback criticizing their leadership skills evidenced more spontaneous mental contrasting than the other modes of thinking about the future, and more mental contrasting than those who received supportive feedback. After negative feedback, people need to reconsider whether to carry on goal pursuit or disengage. Hence, negative feedback should ready people to use mental contrasting to realign their goal pursuit with expectations of success. Our studies show that mental contrasting in turn is helpful for effectively dealing with the negative feedback itself.

Conclusion

Research finds that mental contrasting of desired and feasible futures forges strong goal commitments; the present four studies show that these commitments are strong enough to keep people on track even when facing adversity. These findings furthermore extend research on negative feedback by pointing out that self-regulation strategies can foster effective responses to this threatening information. As mental contrasting is a parsimonious and easy-to-apply procedure, it may be a viable route to help people to cope with one of the most difficult tasks in goal striving: carrying on despite negative feedback.

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