

**ARTICLE**

# The power of prospection: mental contrasting and behavior change

Gabriele Oettingen<sup>1,2</sup> | Klaus Michael Reininger<sup>2</sup>

<sup>1</sup> Psychology Department, New York University, New York, New York, USA

<sup>2</sup> Institute of Psychology, University of Hamburg, Hamburg, Germany

**Correspondence**

Gabriele Oettingen, Psychology Department, New York University, 6 Washington Place, New York, New York 10003, USA.  
Email: gabriele.oettingen@nyu.edu

**Abstract**

People often immerse themselves in dreams and fantasies about a desired future. Though such future fantasies are pleasant, they do not necessarily lead to the effort required to attain the desired future. Indeed, the more positively people fantasize about their desired futures, the less effort they invest and the less successful they are in realizing these futures. However, when fantasies about a desired future are complemented with a clear sense of reality, people find the direction and energy needed to realize their fantasies. We review Fantasy Realization Theory, which explicates these ideas and led to the discovery of mental contrasting future and reality, a self-regulation strategy of behavior change. Mental contrasting helps people figure out what they really want and wisely select, commit to, and actively pursue prioritized wishes while constructively dealing with setbacks. It helps them live a rewarding life through work, play, health, and relationships.

**KEYWORDS**

behavior change, fantasy, mental contrasting, self-regulation, expectations, goals

## 1 | INTRODUCTION

I'm extremely motivated and I'm looking forward to the interview. I have the chance to get my favorite job, that's why I'm so well prepared. And I don't have any anxiety about it.

This quote stems from a research participant's fantasies in response to an open-ended scenario that addressed looking for a new job. Though one would think that such positive thinking fosters energy and effort to prepare for and excel in the job interview, research in the past 20 years has different surprising results: Contrary to what we might think, positive thinking about the future does not only not help but also in fact hurts effort and success. In fact, it decreases energy and impairs successful performance in life domains as diverse as work, interpersonal relations, and health. However, there is a way to overcome the pitfalls of positive future thinking: complementing it with the obstacles of present reality that stand in the way of realizing the desired future. In the present review,

we will first forage for the origins and consequences of positive future thoughts and dreams. We will then introduce mental contrasting future and reality, a self-regulation strategy that people can use to fulfill their wishes and solve their concerns. We will describe the conscious and non-conscious mechanisms of mental contrasting and conclude with presenting intervention studies showing that mental contrasting can be acquired and used as a cost and time effective strategy that helps people initiate and maintain behavior change in everyday life and long-term development.

## 2 | THE ORIGINS OF POSITIVE FANTASIES: NEEDS

Asking for the origins of positive fantasies, H. B. Kappes, Schwörer, and Oettingen (2012) observed that positive fantasies originate from people's needs. Research participants whose needs were aroused or who had stronger needs generated more positive fantasies about satisfying their needs than those whose needs were not aroused or who had weaker needs. This pattern of results emerged across four studies: for psychological and physiological needs, for needs in different life domains (e.g., need for meaning in life, need for water, need for relatedness, and need for power), and regardless of whether the needs were experimentally induced or measured.

These findings help explicate when and why people imagine positive and idealized futures. Hull (1943) posited that needs and the resulting drive originate from deprivation, in turn, spurring action to remedy that deprivation. He notes that a need aims to increase the incentive value of stimuli that potentially satisfy that need. Although in recent decades the concept of needs has become less popular, some theoretical approaches, while still adhering to Hull's conception of needs, have both broadened and deepened the theoretical arguments surrounding this construct (reviews by Gollwitzer, H. B. Kappes, & Oettingen, 2011; Kenrick, Griskevicius, Neuberg, & Schaller, 2010; Reeve, 2008). The central question was and still is: How do needs cause people to remedy the deprivation?

### 2.1 | Needs: Relevant fantasies

Needs make people attend to relevant stimuli. For instance, people deprived of water were faster to recognize stimuli related to thirst (e.g., cup and water) and also remembered more relevant objects (e.g., a glass and a bottle) than participants who were not deprived of water (Aarts, Dijksterhuis, & De Vries, 2001). However, a person's present physical environment may not include the relevant stimuli. In that case, a person's needs may influence a person's mental images. In fact, it has long been known that needs are expressed in people's free thoughts and images, or fantasies. In related studies, researchers inferred people's needs via behavior or assessed them via self-report, or they induced needs by deprivation. Then, they analyzed the content of imaginative stories that participants generated. For instance, men with a high (vs. low) need for power wrote more stories with characters striving for social influence and status (Skolnick, 1966; Veroff, 1957). Further, when the researchers induced physiological needs (e.g., for food) and psychological needs (e.g., for achievement), participants produced more fantasies related to eating and achieving, respectively (Atkinson & McClelland, 1948; McClelland, Clark, Roby, & Atkinson, 1949). Taken together, the studies suggest that both chronic and temporarily aroused needs generate fantasies related to that need.

### 2.2 | Needs: Positive fantasies

Though studies have addressed whether needs influence the themes in a person's fantasies, they have not addressed whether needs also affect the valence of people's fantasies. H. B. Kappes et al. (2012) asked this question. Fantasies originating from aroused needs depict an idealized version of future events and scenarios; they portray a wonderful future that is easily and smoothly attained. Thus, positive fantasies, unlike other forms of future thought, permit people to mentally enjoy the depicted future right now, in the current moment, free from constraints. People mentally experience satisfying a need when the need cannot be resolved in the current situation. Positive fantasies, however,

do not actually satiate a person's needs. In fact, positive fantasies and daydreams even hurt effort and thus lower the chances of fulfilling one's fantasies – at least when the way towards fulfilling the fantasies and satisfying the need is challenging (Oettingen & Mayer, 2002).

### 3 | THE CONSEQUENCES OF POSITIVE FANTASIES: LOW SUCCESS

#### 3.1 | Positive fantasies and low success: Evidence

Research on diverse areas of motivation over the past two decades has suggested and shown that the more positive people's thoughts and fantasies are, the less effort people put into realizing them. For example, the more positively people in a weight reduction program fantasized about successful weight loss, the less weight they lost 3 months and 1 year later (Oettingen & Wadden, 1991). Similar results were found for university graduates fantasizing about their future jobs (Oettingen & Mayer, 2002), for students fantasizing about academic success (Oettingen & Mayer, 2002; H. B. Kappes, Oettingen, & Mayer, 2012), and in other studies in the interpersonal and health domains (Oettingen & Mayer, 2002). The findings are in line with research on outcome (vs. process) simulations (Taylor, Pham, Rivkin, & Armor, 1998) as well as upward social and temporal comparisons in the reflection (vs. evaluation) mode (Markman & McMullen, 2003), both of which find positive imagery lowering effort and performance.

Taken together, these findings suggest that although positive future fantasies may be pleasurable in the moment, they hamper actual success. Indeed, in four studies, Oettingen, Mayer, and Portnow (2016) showed that positive fantasies related to fewer depressive symptoms currently, but more depressive symptoms 1 to 7 months later. This pattern of results held for adults and children and for fantasies assessed via questionnaire as well as via daily diary. Importantly, in a study with college students, the predictive relation between positive future fantasies and higher depressive symptoms over time was partially mediated by low effort and less success in the students' academic work. These findings support the idea that needs facilitate positive fantasies in the moment, but positive fantasies alone do little to energize people to actually achieve their desired future and satisfy their needs.

#### 3.2 | Positive fantasies and low success: Mechanisms

But why are positive fantasies a hindrance to wish fulfillment? Oettingen and Mayer (2002) speculated that positive fantasies about a desired future lead people to feel and behave as though they have already attained that future, sapping their energy and thus reducing attainment of the desired future. To test this idea, students were induced to positively fantasize about winning a large monetary prize. Then they had to trade between a smaller monetary reward they could have right now versus a large reward that was available only later. In contrast to control participants who were induced to question the desirability of winning, or did not get winning-related instructions, the positively fantasizing participants chose rewards typically seen in people who are sated with money (Sciarappa, Norton, Oettingen, & Gollwitzer, 2015). Apparently, positive fantasies allowed participants to mentally attain their desired future (winning the monetary prize), so that they did not care as much anymore about getting the immediate monetary reward. Similar findings emerged when using nonconscious affect related to the desired future as an indicator for mental attainment (H. B. Kappes, A. Kappes, & Oettingen, 2015).

##### 3.2.1 | Low energization

Because positive fantasies foster mental attainment, they should lead to lower energization. High energization, however, is needed to realize a desired future (Brehm & Self, 1989). In other words, positive fantasies should relax people instead of energizing them (Oettingen & Mayer, 2002). In four experiments, H. B. Kappes, Oettingen, Mayer, and Maglio (2011) found evidence for this hypothesis. For example, women who were led to positively imagine (vs. question) looking beautiful in fancy high heels exhibited lower energization as measured by systolic blood pressure

(SBP; Wright, 1996). Similar results emerged in two other studies where energization was measured by self-report. In a fourth study, the authors found that positive fantasies originating from acutely aroused needs were particularly relaxing (i.e., whether the aroused need was for achievement or water).

### 3.2.2 | Challenging situations

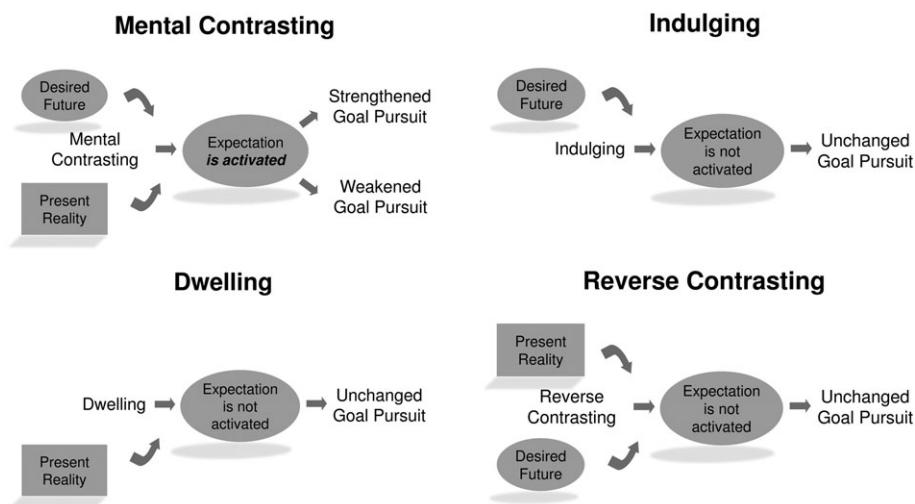
Of course, the relaxing effect of positive fantasies is only problematic for desired futures that demand energy and effort. In the domain of charitable giving, for example, solicitations often try to induce positive fantasies and images of successfully helping others. However, do such positive fantasies actually lead to increased charitable giving? H. B. Kappes, Sharma, and Oettingen (2013) analyzed the role of positive fantasies about successfully helping others when high (vs. low) resources were demanded. In three studies, positive fantasies about successfully donating (e.g., vs. factual thoughts) caused student participants to be less ready to give time, energy, or money when donating demanded many resources, but not when donating demanded few resources. In addition, positive fantasies gave students the impression that donating many (but not few) resources was overly demanding. Apparently, positive fantasies hinder charitable giving, particularly when donating demands valuable resources such as time, energy, or money.

## 4 | FANTASY REALIZATION: MENTAL CONTRASTING

Positive future fantasies are pleasant at the moment, but they decrease actual realization of one's fantasies. Positive fantasies are risky in that they enable people to mentally attain a desired future in the here and now that decreases energy required to handle challenging situations. However, positive fantasies have important functions: Apart from keeping people focused on their needs, they also allow them to mentally explore the various options and possibilities that the future might hold. Thus, can positive future fantasies help people fulfill effortful and demanding wishes?

Fantasy realization theory (Oettingen, 2000; Oettingen, 2012) presents a solution: In order to inspire behavior change, positive future fantasies need to be complemented with a clear sense of reality. That is, when positive fantasies are mentally contrasted with potential obstacles, they provide the effort and energy necessary to realize the fantasies. However, energization will occur only when chances of success are high; when achievability looks bleak, mental contrasting leads to actively letting go of the unfeasible wish.

The theory specifies four modes of self-regulatory thought (Figure 1). The first mode is called *mental contrasting*. A person who engages in mental contrasting fantasizes about a desired future (e.g., finishing a report) and then identifies and imagines the critical obstacle standing in its way (e.g., being easily distracted). The fantasies allow for mentally experiencing the desired future and thus give action direction; identifying and imagining the critical obstacle unveil whether and in what way the obstacle can be overcome, thus providing the necessary energy. The theory specifies three other modes of thought: indulging in the desired future, dwelling on the obstacle, and reverse contrasting. *Indulging* entails only generating positive fantasies about a desired future. *Dwelling* involves simply brooding about the obstacles of present reality. *Reverse contrasting* is similar in content to mental contrasting, but not in structure: the obstacle is mentally elaborated before imagining the desired future. Importantly, only mental contrasting provides both the direction to act (via mental elaborations of the desired future) as well as the energy to overcome potential resistance on the road to wish fulfillment (via mental elaborations of the obstacle). When people see the obstacle as surmountable (i.e., expectations of success are high), they will fully commit and work for the desired future; when people see the obstacles as insurmountable or too costly (i.e., when expectations of success are low), they will adjust their wish, postpone wish fulfillment to a better point in time, delegate it, or let it go altogether. In this way, mental contrasting is a way to prioritize: People select those wishes that are important and feasible and let go of those that are not that important, too costly, or unrealizable.



**FIGURE 1** Mode of self-regulatory thought (Oettingen, 2012, p. 21)

When people engage in reverse contrasting, they elaborate the reality and only then imagine the desired future. Thus, the future cannot function as the anchor or background against which the reality is contrasted. Consequently, the reality is not understood as an impediment or obstacle on the way to the desired future, and no behavior change is induced. The same is true of indulging and dwelling. In indulging, there is no obstacle to energize the person, while in dwelling, there are no fantasies about the future to provide the direction in which to act.

Note that mental contrasting does not change expectations of success; rather, it translates expectations into behavior. In fact, expectations of success *before* and *after* mental contrasting are almost perfectly correlated, and their means are not differentially affected by the manipulation of the four modes of thought: indulging, dwelling, reverse contrasting, and mental contrasting. In sum, rather than altering expectations, mental contrasting (unlike the other specified modes of thought) makes expectations of success relevant for cognition, emotion, and behavior (Oettingen, Pak, & Schnetter, 2001).

## 4.1 | Mental contrasting and behavior change: Evidence

Mental contrasting has been tested in the domains of academic and professional achievement, health, and interpersonal relations. We will describe one example study in the interpersonal domain and then summarize findings in the other domains.

### 4.1.1 | Interpersonal domain

University students were asked to indicate their most important wish or concern regarding their friends or family and to report whether they expected this wish or concern to have a happy ending (Oettingen et al., 2001). Students generated wishes such as "become more trusting with my partner" or "resolve a problem with my roommate." All participants then had to name the desired outcomes of their wish and the obstacles that stood in the way of realizing their wish. In four conditions, students were either asked to mentally elaborate the desired outcomes and the obstacles (mental contrasting), the desired outcomes only (indulging), the obstacles only (dwelling), or the obstacles and then the desired outcomes (reverse contrasting). Afterwards, all participants reported their feelings of energization, and 2 weeks later, they reported when the most difficult steps to fulfilling their wishes occurred. In contrast to the three control groups (indulging, dwelling, and reverse contrasting), students in the

mental contrasting group felt and acted in accord with their expectations of success. When expectations of success were high, participants felt most energized and acted swiftly to fulfill their wish; when expectations were low, they felt least energized and delayed their steps towards fantasy realization, thus saving energy for more important or more feasible wishes.

#### 4.1.2 | Other domains

Mental contrasting has fostered behavior change in achievement, such as learning a foreign language (Oettingen, Höning, & Gollwitzer, 2000; A. Gollwitzer, Oettingen, Kirby, Duckworth, & Mayer, 2011), going abroad (Oettingen et al., 2001), enrolling in a self-improvement program (Oettingen, Mayer, Thorpe, Janetzke, & Lorenz, 2005), and excelling in mathematics (Oettingen et al., 2001). Mental contrasting also facilitates everyday life management in terms of finding integrative (win-win) solutions (Kirk, Oettingen, & Gollwitzer, 2011), making easy and effective decisions (Oettingen, Mayer, & Brinkmann, 2010), and combining work and family in female doctoral students (Oettingen, 2000). In the health domain, mental contrasting fostered the necessary steps to reduce cigarette consumption (Oettingen, Mayer, & Thorpe, 2010), heightened physical activity in obese sedentary men (Sheeran, Harris, Vaughan, Oettingen, & Gollwitzer, 2013), and improved management of diabetes 2 symptoms (Adriaanse, de Ridder, & Voorneman, 2013). Benefits of mental contrasting also emerged in the interpersonal domain. It induced conciliatory behavior in response to a transgression (Schrage, Schwörer, & Oettingen, 2016), tolerance and social responsibility towards members of out-groups (Oettingen et al., 2005), feelings of inspiration to fulfill personal wishes (Reininger, Riess, Schwörer, & Oettingen, 2016, May), and seeking and giving help among students and health care providers (Oettingen, Stephens, Mayer, & Brinkmann, 2010).

### 4.2 | Mental contrasting: Mechanisms

But how does mental contrasting achieve these outcomes? Mental contrasting is a conscious imagery technique that works via nonconscious processes. These processes pertain to cognition, motivation, and responses to setbacks. Thus, mental contrasting engages these mechanisms outside of people's awareness. In turn, these mechanisms predict active striving for feasible wishes and disengagement from unfeasible wishes.

#### 4.2.1 | Implicit cognition

Three mechanisms of mental contrasting effects on behavior change relate to implicit cognitions: Mental contrasting changes the interpretation of reality as an obstacle to wish fulfillment. It also modulates implicit associations: between future and the obstacle and between the obstacle and the behavior to overcome the obstacle.

##### 4.2.1.1 | Interpreting reality as an obstacle to the desired future

Reality is seen as an obstacle only when it is elaborated against the background of a desired future. Think of a student who wants to excel in a future exam. The party the weekend before the exam appears to the student as an obstacle, only when contrasted against the vividly imagined success in the future exam. Thus, pondering the party before fantasizing about success on the exam will not energize her to work towards performing well on the exam. In other words, mentally elaborating the reality before fantasizing about the future (reverse contrasting) will not activate the necessary energy or effort, just like indulging, dwelling, or no inductions of thoughts (Oettingen, 2000; Oettingen et al., 2001). A. Kappes, Wendt, Reinelt, and Oettingen (2013) assessed how students implicitly re-categorize reality as an obstacle by using a task that measures implicit categorization (task-switching paradigm; Kiesel et al., 2010). They found that mental contrasting led participants to implicitly categorize their reality as obstacle in line with expectations (e.g., a fun party is now perceived as an obstacle to excel in an upcoming test). Obstacle categorization in turn mediated the effects of mental contrasting on effort and success in fulfilling the specified wish. These effects were replicated in two more studies, one of which showed that mental

contrasting also helps to detect previously unspecified real-life obstacles while working on accomplishing the desired future.

#### **4.2.1.2 | Linking the desired future to the obstacle**

To test the hypothesis that the strength of the implicit association between future and obstacle might also be a mediator of mental contrasting effects, A. Kappes and Oettingen (2014) used an acute stress paradigm. Student participants had to give a job talk in front of a camera and were told that their performance would be evaluated by human resource specialists. They were then led to either mentally contrast or reverse contrast about performing well and the obstacles in their way, or they had to think irrelevant positive and negative thoughts. As compared with the reverse contrasting and irrelevant thought control conditions, mental contrasting led to strong future-reality associations when expectations were high, but to weak future-reality associations when expectations were low. Importantly, the strength of these associations mediated students' performance in front of the camera. A. Kappes and Oettingen (2014) replicated these results in studies using affective and behavioral indicators of performance, as well as self-reported and other-rated indicators. Interestingly, when mental contrasting participants were told that they had fulfilled their wish, the expectancy dependence of the strength of the future-reality associations disappeared. This observation is consistent with findings in the goal literature: People stop striving when they feel that their goal is completed (Förster, Liberman, & Higgins, 2005; Masicampo & Baumeister, 2011; McCulloch, Fitzsimons, Chua, & Albarracín, 2011).

#### **4.2.1.3 | Linking the obstacle to instrumental behavior**

Importantly, next to future-obstacle associations, the strength of the implicit associations between the obstacle and the instrumental behavior to overcome the obstacle also mediated mental contrasting effects on behavior change. Specifically, for high expectations, mental contrasting strengthened the implicit association between the obstacle and the behavior to overcome the obstacle; for low expectations of success, mental contrasting weakened this association (A. Kappes, Singmann, & Oettingen, 2012). The obstacle-behavior associations in turn mediated actual behavior change (e.g., taking the stairs instead of the elevator for fulfilling participants' fitness wish).

#### **4.2.2 | Implicit motivation: Energization**

Oettingen et al. (2009) speculated that energization might mediate the effects of mental contrasting on effort and performance. They measured energization by using an implicit indicator, SBP (Wright, 1996). Student participants named an interpersonal wish or concern and indicated their expectations of successfully resolving it. After mentally contrasting or indulging, the authors measured participants' SBP. Energization mediated the effects of mental contrasting on wish fulfillment. A series of other studies replicated and extended these findings, using SBP and self-report as indicators of energization (Sevincer, Busatta, & Oettingen, 2014).

#### **4.2.3 | Responses to negative feedback**

Negative feedback often contains useful information that advances one's goals (Audia & Locke, 2003). Moreover, it can promote learning and the acquisition of new skills (Ball, Hoyle, & Towse, 2010; Nussbaum & Dweck, 2008). Still, negative feedback may be interpreted as threatening, and people may fail to process it; in contrast, people embrace and readily process positive feedback as it is self-affirming (Sedikides & Green, 2009). Mental contrasting supports people in processing information inherent in negative feedback (A. Kappes, Oettingen, & Pak, 2012). When expectations were high, mental contrasting helped participants learn from negative feedback and subsequently form constructive plans. At the same time, mental contrasting protected participants' sense of competence. However, when expectations were low, mental contrasting led to reduced processing of negative feedback and to a lower self-view of competence, fostering disengagement from wish fulfillment and freeing up energy for more feasible projects. Participants in the control groups (indulging and dwelling) did not change in processing negative feedback

regardless of whether they perceived their wish as feasible or not. In sum, when expectations of success are high, mental contrasting enables people to effectively process goal-relevant feedback even when it is negative, while simultaneously sheltering their sense of competence.

#### 4.3 | Mental contrasting: Spontaneous use

Using content analysis, Sevincer and Oettingen (2013) observed spontaneous mental contrasting as it unfolds in the stream of consciousness. Participants were asked to think and write about a personal wish or concern; spontaneous mode of thought was inferred by content analysis from their writing. Such spontaneous mental contrasting, just like experimentally manipulated mental contrasting, predicted expectancy-based effort and success (H. B. Kappes & Oettingen, 2011; Sevincer & Oettingen, 2013). Measuring spontaneous mental contrasting allowed us to analyze context and person variables conducive to engaging in mental contrasting. Considering context variables, primes of future and reality increased the use of mental contrasting, as did the anticipation of an impending task (Sevincer, Schlier, & Oettingen, 2015). Finally, rather than using content analysis, H. B. Kappes et al. (2011) measured mental contrasting with a choice paradigm, finding in four studies that participants induced with sad (vs. happy or neutral) mood engaged more in mental contrasting. Apparently, sad mood signaled that a problem needed to be solved.

As for person variables, because mental contrasting involves mental effort (Achtziger, Fehr, Oettingen, Gollwitzer, & Rockstroh, 2009), people who have a need for cognition (i.e., enjoy effortful processing; Cacioppo, Petty, & Kao, 1984) should be more likely to use mental contrasting. As a problem-solving strategy, mental contrasting should relate to self-reports of effective self-regulation (Baumeister & Heatherton, 1996; Tangney, Baumeister, & Boone, 2004). Sevincer, Mehl, and Oettingen (2016) recently supported these ideas. While the reported studies highlighted who would use mental contrasting under which circumstances, they also showed that only 15% of the participants spontaneously engaged in mental contrasting (averaged across all three studies; Sevincer & Oettingen, 2013). Thus, interventions teaching how to engage in mental contrasting during everyday life are needed.

#### 4.4 | Mental contrasting: Interventions

We have shown that mental contrasting helps people to select and pursue projects that are important and manageable and adjust or let go of projects that are draining or unfeasible. Intervention research supports these experimental findings: For example, mental contrasting (vs. indulging) taught as a meta-cognitive strategy to middle managers led to more prudent decision making during their everyday life. They more easily decided, managed their time better, completed some projects, but dropped others (Oettingen et al., 2010), and in a negotiation setting discovered more integrative solutions (Kirk et al., 2011; for a summary of the intervention work, see Oettingen, 2012; Oettingen, 2014).

Importantly, however, sometimes letting go from desired futures is not advisable or feasible, such as when children need to learn basic academic skills or when people need to change their health behavior. In such cases there are ways to teach mental contrasting that provide high expectations of success so that people actively pursue the respective desired futures. Interventions have focused on guaranteeing high expectations by either creating high expectations or by capitalizing on existing high expectations.

##### 4.4.1 | Providing high expectations

Positive feedback can induce high expectations of success, especially in areas where people do not have extensive performance experience. In two studies, Oettingen, Marquardt, and Gollwitzer (2012) gave positive or moderate bogus feedback regarding participants' creative potential before they randomly asked participants to either mental contrast, indulge, or dwell about their performance on an impending creativity test. Mental contrasting participants who received positive feedback and thus had high expectations of success about their creative potential were more creative than mental contrasting participants who received moderate feedback and thus had comparatively lower

expectations of success. They also outperformed those in the indulging, dwelling, and unrelated content conditions, irrespective of feedback valence.

Another way to build high expectations is by providing tasks that are feasible, but still challenging and effortful to solve. A. Gollwitzer and colleagues (2011) used such a task. They asked German (Study 1) and US schoolchildren (Study 2) of low-income neighborhoods to learn several foreign language words with the prospect of doing well on a short upcoming quiz. The authors assured high expectations of success by providing words that, according to the students' teachers, all participating students could memorize. That is, the obstacles to succeeding in the task were not related to students' ability, rather to their effort, and thus, the obstacles were surmountable. As early as second grade, teaching mental contrasting promoted performance in the language quiz, and these findings were replicated in US fifth graders. Thus, a short written intervention of mental contrasting can lead young children to solve feasible academic tasks even in large classroom settings.

The most prominent way to guarantee high expectations of success in mental contrasting interventions is for people to name their own wishes that they themselves deem feasible. For example, dieting students who were taught how to mental contrast a dieting wish that they felt was attainable within a 2-week period were more successful in lowering their calorie-intake than those who were taught to indulge or did not receive an intervention. The benefits in the diet domain even transferred to the exercise domain: Students who used mental contrasting also reported having exercised more (Johannessen, Oettingen, & Mayer, 2012). In sum, mental contrasting provides insight that wishes to pursue and that wishes to let go from, and it will help to act on that insight. When applied to feasible wishes only, it will lead people to uniquely pursue those feasible wishes.

## 5 | FANTASY REALIZATION: MENTAL CONTRASTING WITH IMPLEMENTATION INTENTIONS (MCII)

While mental contrasting strengthens the implicit association between the obstacle and the behavior to overcome the obstacle (A. Kappes, et al., 2012), further strengthening these associations may additionally aid the fulfillment of one's wishes, in particular when obstacles are hard to surmount. Thus, mental contrasting was combined with implementation intentions. Implementation intentions, or "If situation X, then I will perform goal-directed response Y!" plans (Gollwitzer, 1999; Gollwitzer, 2014), provoke automatic goal-directed responses when the specified situation is encountered. Numerous studies convincingly show that these if-then plans effectively promote goal attainment ( $d = 0.65$ ; meta-analysis by Gollwitzer & Sheeran, 2006). However, there are prerequisites to benefiting from implementation intentions: People need to be fully determined to reach their goal (Sheeran, Webb, & Gollwitzer, 2005); they need to have specified the relevant situation X; and they need to have specified the relevant behavior Y. Mental contrasting provides all three prerequisites: It fosters determination and active goal pursuit, it identifies the situation X (obstacle), and it identifies the behavior to overcome the obstacle. After mental contrasting, people can plug the obstacle into the if-part and the behavior to surmount the obstacle into the then-part of an implementation intention. Thus, it seemed beneficial to create the self-regulatory technique of mental contrasting with implementation intentions (MCII; Oettingen, 2012; Oettingen, 2014; Oettingen & Gollwitzer, 2010).

### 5.1 | MCII: Interventions

Mental contrasting and MCII are content-independent strategies allowing people to discover their own idiosyncratic wishes and detect their own obstacles. People can use the strategies to prioritize their wishes or to fulfill wishes that they have a priori defined as challenging but feasible (i.e., wishes of high expectations of success). When mental contrasting is used to prioritize, people will fully commit to wishes of high expectations, and delegate, postpone, or let go from those with low expectations. If solely applied to wishes of high expectations, to the contrary, mental

contrasting and MCII will enable people to see their wishes through. Used as a meta-cognitive strategy, whether geared to prioritize or to fulfill specified high-expectancy wishes, it emancipates people from educators, trainers, or researchers. Furthermore, this content-independent approach is in contrast to most research on implementation intentions, where researchers have pre-populated the if–then structure (e.g., Gollwitzer & Sheeran, 2006; Armitage, 2004). Importantly, mental contrasting specifies the idiosyncratic content for forming relevant implementation intentions.

Indeed, Kirk, Oettingen, and Gollwitzer (2013) used an integrative bargaining task to show that MCII led to more win-win solutions than using either mental contrasting or implementation intentions alone, and importantly, that this effect was mediated by enhanced cooperation. Specifically, participants formed more plans to cooperate and were more considerate of their negotiation partner when they had previously engaged in mental contrasting. In the health domain, MCII supported people trying to break their idiosyncratic bad habits (snacking), again, more than either strategy alone; mental contrasting clarified their personal obstacles, which then facilitated forming effective if–then plans (Adriaanse et al., 2010).

Because MCII allows for idiosyncratic contents, it can benefit behavior change across life domains. In the domains of school and work, it fostered time management in low-income working mothers who attended a vocational program (Oettingen, H. B. Kappes, Guttenberg, & Gollwitzer, 2015), the quality of homework in school children at risk and not at risk for attention deficit hyperactivity disorder (Gawrilow, Morgenroth, Schultz, Oettingen, & Gollwitzer, 2013), the effort to study for a standardized test (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011), and attendance and grade point average in fifth graders from low-income homes (Duckworth, Kirby, Gollwitzer, & Oettingen, 2013). In the health domain, it promoted regular exercise and healthy eating in middle-aged women (Stadler, Oettingen, & Gollwitzer, 2009; Stadler, Oettingen, & Gollwitzer, 2010), physical activity and weight loss in stroke patients (Marquardt, Oettingen, Gollwitzer, Sheeran, & Liepert, 2016), and physical capacity in chronic back pain patients (Christiansen, Oettingen, Dahme, & Klinger, 2010). In the interpersonal domain, it helped to overcome insecurity-related behavior (Houssais, Oettingen, & Mayer, 2013), romantic couples' communication about a sensitive topic (Cachia, A. Gollwitzer, Thorson, & Oettingen, 2015), and forgiveness after interpersonal trespasses (Schrage et al., 2016).

In sum, teaching mental contrasting and MCII helped people to gain insight into their daily lives, prioritize their goals, and fulfill their wishes. It benefitted people across age groups and from different backgrounds and countries. Teaching mental contrasting and MCII has been successful in mental and written form, using paper and pencil, as well as online and mobile devices. It consists of four steps that have been described as Wish, Outcome, Obstacle, Plan (WOOP, Figure 2). Because mental contrasting and MCII are content-independent self-regulatory tools, people can use them to fulfill their idiosyncratic wishes and solve their idiosyncratic concerns without the help of outside advice (see [www.woopmylife.org](http://www.woopmylife.org)).



FIGURE 2 The four steps of WOOP (Oettingen, 2014, p. 167)

## 6 | CONCLUSION

Looking back to the idealized fantasies of excelling in a job interview quoted at the beginning of the article, the reported findings elucidate how to make such fantasies come true. Positive fantasizing alone, as pleasant and relaxing as it might be, does not help us prepare for solving challenging tasks. It leaves us happily enjoying the future laurels, just in our minds. But mentally contrasting idealized fantasies with the obstacles in the way will energize us to actually realize our fantasies. Mental contrasting is an imagery technique triggering nonconscious processes that silently guide us to prepare for the interview. Now, we are likely to excel, thus satisfying our need for employment and meaningful work.

## ACKNOWLEDGEMENTS

Preparation of this article was supported by German Research Foundation Grant Oe-237/13-1 awarded to Gabriele Oettingen and by a graduate scholarship of the German National Academic Foundation awarded to Klaus Michael Reininger. We thank Anton Gollwitzer and Peter M. Gollwitzer for making valuable comments on a previous version of the article.

## REFERENCES

- Aarts, H., Dijksterhuis, A., & De Vries, P. (2001). On the psychology of drinking: Being thirsty and perceptually ready. *British Journal of Psychology*, 92, 631–631.
- Achtziger, A., Fehr, T., Oettingen, G., Gollwitzer, P. M., & Rockstroh, B. (2009). Strategies of intention formation are reflected in continuous MEG activity. *Social Neuroscience*, 4, 11–27.
- Adriaanse, M. A., de Ridder, D. T. D., & Voorneman, I. (2013). Improving diabetes self-management by mental contrasting. *Psychology and Health*, 28, 1–12.
- Adriaanse, M. A., Oettingen, G., Gollwitzer, P. M., Hennes, E. P., de Ridder, D. T. D., & de Witt, J. B. F. (2010). When planning is not enough: Fighting unhealthy snacking habits by mental contrasting with implementation intentions (MCII). *European Journal of Social Psychology*, 40, 1277–1293.
- Armitage, C. J. (2004). Evidence that implementation intentions reduce dietary fat intake: A randomized trial. *Health Psychology*, 23, 319–323.
- Atkinson, J. W., & McClelland, D. C. (1948). The projective expression of needs: II: The effect of different intensities of the hunger drive on thematic apperception. *Journal of Experimental Psychology*, 38, 643–658.
- Audia, P. G., & Locke, E. A. (2003). Benefiting from negative feedback. *Human Resource Management Review*, 13, 631–646.
- Ball, L. J., Hoyle, A., & Towse, A. (2010). The facilitatory effect of negative feedback on the emergence of analogical reasoning abilities. *British Journal of Developmental Psychology*, 28, 583–602.
- Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, 7, 1–15.
- Brehm, J. W., & Self, E. A. (1989). The intensity of motivation. *Annual Review of Psychology*, 40, 109–131.
- Cachia, J. Y. A., Gollwitzer, A., Thorson, K. R., & Oettingen, G. (2015). MCII in relationship communication. Unpublished raw data.
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 48, 306–307.
- Christiansen, S., Oettingen, G., Dahme, B., & Klinger, R. (2010). A short goal-pursuit intervention to improve physical capacity: A randomized clinical trial in chronic back pain patients. *Pain*, 149, 444–452.
- Duckworth, A. L., Grant, H., Loew, B., Oettingen, G., & Gollwitzer, P. M. (2011). Self-regulation strategies improve self-discipline in adolescents: Benefits of mental contrasting and implementation intentions. *Educational Psychology*, 31, 17–26.
- Duckworth, A. L., Kirby, T. A., Gollwitzer, A., & Oettingen, G. (2013). From fantasy to action: Mental contrasting with implementation intentions (MCII) improves academic performance in children. *Social Psychological and Personality Science*, 4, 745–753.
- Förster, J., Liberman, N., & Higgins, E. T. (2005). Accessibility from active and fulfilled goals. *Journal of Experimental Social Psychology*, 41, 220–239.

- Gawrilow, C., Morgenroth, K., Schultz, R., Oettingen, G., & Gollwitzer, P. (2013). Mental contrasting with implementation intentions enhances self-regulation of goal pursuit in schoolchildren at risk for ADHD. *Motivation and Emotion*, 37, 134–145.
- Gollwitzer, A., Oettingen, G., Kirby, T. A., Duckworth, A. L., & Mayer, D. (2011). Mental contrasting facilitates academic performance in school children. *Motivation and Emotion*, 35, 403–412.
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54, 493–503.
- Gollwitzer, P. M. (2014). Weakness of the will: Is a quick fix possible? *Motivation and Emotion*, 38, 305–322.
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, 38, 69–119.
- Gollwitzer, P. M., Kappes, H. B., & Oettingen, G. (2011). Needs and incentives as sources of goals. In H. Aarts, & A. Elliot (Eds.), *Goal-directed behavior* (pp. 115–149). Philadelphia: Psychology Press/Taylor & Francis.
- Houssais, S., Oettingen, G., & Mayer, D. (2013). Using mental contrasting with implementation intentions to self-regulate insecurity-based behaviors in relationships. *Motivation and Emotion*, 37, 224–233.
- Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*. New York: Appleton-Century-Crofts.
- Johannessen, K. B., Oettingen, G., & Mayer, D. (2012). Mental contrasting of a dieting wish improves self-reported health behaviour. *Psychology and Health*, 27, 43–58.
- Kappes, A., & Oettingen, G. (2014). The emergence of goal pursuit: Mental contrasting connects future and reality. *Journal of Experimental Social Psychology*, 54, 25–39.
- Kappes, A., Oettingen, G., & Pak, H. (2012). Mental contrasting and the self-regulation of responding to negative feedback. *Personality and Social Psychology Bulletin*, 38, 845–856.
- Kappes, A., Singmann, H., & Oettingen, G. (2012). Mental contrasting instigates goal pursuit by linking obstacles of reality to instrumental behavior. *Journal of Experimental Social Psychology*, 48, 811–818.
- Kappes, A., Wendt, M., Reinelt, T., & Oettingen, G. (2013). Mental contrasting changes the meaning of reality. *Journal of Experimental Social Psychology*, 49, 797–810.
- Kappes, H. B., & Oettingen, G. (2011). Positive fantasies about idealized futures sap energy. *Journal of Experimental Social Psychology*, 47, 719–729.
- Kappes, H. B., Kappes, A., & Oettingen, G. (2015). When attainment is all in your head. Unpublished manuscript.
- Kappes, H. B., Oettingen, G., & Mayer, D. (2012). Positive fantasies predict low academic achievement in disadvantaged students. *European Journal of Social Psychology*, 42, 53–64.
- Kappes, H. B., Oettingen, G., Mayer, D., & Maglio, S. (2011). Sad mood promotes self-initiated mental contrasting of future and reality. *Emotion*, 11, 1206–1222.
- Kappes, H. B., Schwörer, B., & Oettingen, G. (2012). Needs instigate positive fantasies of idealized futures. *European Journal of Social Psychology*, 42, 299–307.
- Kappes, H. B., Sharma, E., & Oettingen, G. (2013). Positive fantasies dampen charitable giving when many resources are demanded. *Journal of Consumer Psychology*, 23, 128–135.
- Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations. *Perspectives on Psychological Science*, 5, 292–314.
- Kiesel, A., Steinhauser, M., Wendt, M., Falkenstein, M., Jost, K., Philipp, A. M., & Koch, I. (2010). Control and compatibility in task switching – A review. *Psychological Bulletin*, 136, 849–847.
- Kirk, D., Oettingen, G., & Gollwitzer, P. M. (2011). Mental contrasting promotes integrative bargaining. *International Journal of Conflict Management*, 22, 324–341.
- Kirk, D., Oettingen, G., & Gollwitzer, P. M. (2013). Promoting integrative bargaining: Mental contrasting with implementation intentions. *International Journal of Conflict Management*, 24, 148–165.
- Markman, K. D., & McMullen, M. N. (2003). A reflection and evaluation model of comparative thinking. *Personality and Social Psychology Review*, 7, 244–267.
- Marquardt, M. K., Oettingen, G., Gollwitzer, P. M., Sheeran, P., & Liepert, J. (2016). Self-regulation by mental contrasting with implementation intentions (MCII) improves stroke patients' physical activity over one year. Manuscript submitted for publication.
- Masicampo, E. J., & Baumeister, R. F. (2011). Unfulfilled goals interfere with tasks that require executive functions. *Journal of Experimental Social Psychology*, 47, 685–688.
- McClelland, D. C., Clark, R. A., Roby, T. B., & Atkinson, J. W. (1949). The projective expression of needs: IV. The effect of the need for achievement on thematic apperception. *Journal of Experimental Psychology*, 39, 242–255.

- McCulloch, K. C., Fitzsimons, G. R., Chua, S. N., & Albarracín, D. (2011). Vicarious goal satiation. *Journal of Experimental Social Psychology*, 47, 685–688.
- Nussbaum, A., & Dweck, C. (2008). Defensiveness versus remediation: Self-theories and modes of self-esteem maintenance. *Personality and Social Psychology Bulletin*, 34, 599–612.
- Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition*, 18, 1011–1129.
- Oettingen, G. (2012). Future thought and behaviour change. *European Review of Social Psychology*, 23, 1–63.
- Oettingen, G. (2014). *Rethinking positive thinking: Inside the new science of motivation*. New York: Penguin/Random House.
- Oettingen, G., & Gollwitzer, P. M. (2010). Strategies of setting and implementing goals: Mental contrasting and implementation intentions. In J. E. Maddux, & J. P. Tangney (Eds.), *Social psychological foundations of clinical psychology* (pp. 114–135). New York: Guilford.
- Oettingen, G., & Mayer, D. (2002). The motivating function of thinking about the future: Expectations versus fantasies. *Journal of Personality and Social Psychology*, 83, 1198–1212.
- Oettingen, G., & Wadden, T. A. (1991). Expectation, fantasy, and weight loss: Is the impact of positive thinking always positive? *Cognitive Therapy and Research*, 15, 167–175.
- Oettingen, G., Höning, G., & Gollwitzer, P. M. (2000). Effective self-regulation of goal attainment. *International Journal of Educational Research*, 33, 705–732.
- Oettingen, G., Kappes, H. B., Guttenberg, K. B., & Gollwitzer, P. M. (2015). Self-regulation of time management: Mental contrasting with implementation intentions. *European Journal of Social Psychology*, 45, 218–229.
- Oettingen, G., Marquardt, M., & Gollwitzer, P. M. (2012). Mental contrasting turns positive feedback on creative potential into successful performance. *Journal of Experimental Social Psychology*, 48, 990–996.
- Oettingen, G., Mayer, D., & Brinkmann, B. (2010). Mental contrasting of future and reality: Managing the demands of everyday life in health care professionals. *Journal of Personnel Psychology*, 9, 138–144.
- Oettingen, G., Mayer, D., & Portnow, S. (2016). Pleasure now, pain later: Positive fantasies about the future predict symptoms of depression. *Psychological Science*, 27, 345–353.
- Oettingen, G., Mayer, D., Sevincer, A. T., Stephens, E. J., Pak, H., & Hagenah, M. (2009). Mental contrasting and goal commitment: The mediating role of energization. *Personality and Social Psychology Bulletin*, 35, 608–622.
- Oettingen, G., Mayer, D., & Thorpe, J. (2010). Self-regulation of commitment to reduce cigarette consumption: Mental contrasting of future with reality. *Psychology and Health*, 25, 961–977.
- Oettingen, G., Mayer, D., Thorpe, J. S., Janetzke, H., & Lorenz, S. (2005). Turning fantasies about positive and negative futures into self-improvement goals. *Motivation and Emotion*, 29, 237–267.
- Oettingen, G., Pak, H., & Schnetter, K. (2001). Self-regulation of goal-setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology*, 80, 736–753.
- Oettingen, G., Stephens, E. J., Mayer, D., & Brinkmann, B. (2010). Mental contrasting and the self-regulation of helping relations. *Social Cognition*, 28, 490–508.
- Reeve, J. (2008). *Understanding motivation and emotion*. Hoboken, NJ: John Wiley & Sons.
- Reininger, K. M., Riess, V., Schwörer, B., & Oettingen, G. (2016, May). Mental contrasting induces feelings of inspiration for realizing our wishes. In *Poster presented at the 28th Annual Convention of the Association for Psychological Science*. Chicago: USA.
- Schrage, J., Schwörer, B., & Oettingen, G. (2016). Mental contrasting and conciliatory behavior in romantic relationships. Manuscript submitted for publication.
- Sciarappa, J., Norton, E., Oettingen, G., & Gollwitzer, P. M. (2015). Positive fantasies of winning money reduce temporal discounting. Manuscript in preparation.
- Sedikides, C., & Green, J. D. (2009). Memory as a self-protective mechanism. *Social and Personality Psychology Compass*, 3, 1055–1068.
- Sevincer, A. T., & Oettingen, G. (2013). Spontaneous mental contrasting and selective goal pursuit. *Personality and Social Psychology Bulletin*, 39, 1240–1254.
- Sevincer, A. T., Busatta, P. D., & Oettingen, G. (2014). Mental contrasting and transfer of energization. *Personality and Social Psychology Bulletin*, 40, 139–152.
- Sevincer, A. T., Mehl, P. J., & Oettingen, G. (2016). Living a lively life and the spontaneous use of mental contrasting. Manuscript submitted for publication.
- Sevincer, A. T., Schlier, B., & Oettingen, G. (2015). Ego depletion and the use of mental contrasting. *Motivation and Emotion*, 39, 876–891.

- Sheeran, P., Harris, P., Vaughan, J., Oettingen, G., & Gollwitzer, P. M. (2013). Gone exercising: Mental contrasting promotes physical activity among overweight, middle-aged, low-SES fishermen. *Health Psychology*, 32, 802–809.
- Sheeran, P., Webb, T. L., & Gollwitzer, P. M. (2005). The interplay between goal intentions and implementation intentions. *Personality and Social Psychology Bulletin*, 31, 87–98.
- Skolnick, A. (1966). Motivational imagery and behavior over twenty years. *Journal of Consulting Psychology*, 30, 463–478.
- Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2009). Physical activity in women: Effects of a self-regulation intervention. *American Journal of Preventive Medicine*, 36, 29–34.
- Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2010). Intervention effects of information and self-regulation on eating fruits and vegetables over two years. *Health Psychology*, 29, 274–283.
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72, 271–324.
- Taylor, S. E., Pham, L. B., Rivkin, I. D., & Armor, D. A. (1998). Harnessing the imagination: Mental simulation, self-regulation, and coping. *American Psychologist*, 53, 429–439.
- Veroff, J. (1957). Development and validation of a projective measure of power motivation. *Journal of Abnormal and Social Psychology*, 54, 1–8.
- Wright, R. A. (1996). Brehm's theory of motivation as a model of effort and cardiovascular response. In P. M. Gollwitzer, & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 424–453). New York, NY: Guilford Press.

**How to cite this article:** Oettingen, G., and Reininger, K. M. (2016), The power of prospection: mental contrasting and behavior change, *Social and Personality Psychology Compass*, doi: 10.1111/spc3.12271

## AUTHOR BIOGRAPHIES

Gabriele Oettingen is a Professor of Psychology at New York University and the University of Hamburg. She is exploring how conscious and non-conscious processes interact in influencing people's control of thought, emotion, and behavior. Among others, she has investigated the strengths and perils of positive thinking and discovered the self-regulation strategy of mental contrasting that specifies how people can turn their wishes into binding goals and plans, and eventually goal attainment. For more information, please visit [www.psych.nyu.edu/oettingen/](http://www.psych.nyu.edu/oettingen/).

Klaus Michael Reininger is a PhD student in Psychology at the University of Hamburg, supported by the German National Academic Foundation. He received his MSc in Psychology and his MA in Political Science from the University of Hamburg. His research interests include self-regulation strategies and underlying cognitive processes of extreme behavior.