Motiv Emot (2018) 42:17–36
DOI 10.1007/s11031-017-9644-4

ORIGINAL PAPER

Mental contrasting of counterfactual fantasies attenuates disappointment, regret, and resentment

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Published online: 31 October 2017

Abstract Negative emotions elicited by positive counterfactuals about an alternative past—"if only" reconstructions of negative life events—are functional in preparing people to act when opportunities to restore the alternative past will arise. If the counterfactual past is lost, because restorative opportunities are absent, letting go of the negative emotions should be the better solution, sheltering people from feelings of distress. In six experimental studies, the self-regulation strategy of mental contrasting (Oettingen, European Review of Social Psychology 23:1–63, 2012) attenuated the negative emotions elicited by positive fantasies about a lost counterfactual past, specifically, disappointment, regret and resentment. Mental contrasting (vs. relevant control conditions) led people to feel less disappointed when evaluating their lost counterfactual past compared with their current reality, indicating reduced commitment to the lost counterfactual past (Studies 1, 2, 3, and 4), and it attenuated post-decisional regret and resentment (Studies 5 and 6). These findings held when participants were induced to focus on lost counterfactual pasts for which they were responsible (Studies 4 and 5), for which they blamed another person (Study 6), or for which they deemed no one responsible (Studies 2 and 3). The findings are relevant for building interventions that help people to come to terms with their lost counterfactual past.

Keywords Mental contrasting · Counterfactual thinking · Fantasies · Counterfactual emotions · Emotion regulation

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"If only I had married that girl, my life would have been different. We would have been a good match for each other and we would have made a great couple…" Such mental representations of how our lives could have been better are termed *counterfactual*, representing an alternative scenario to the factual past (Kahneman and Miller 1986; Kahneman and Tversky 1982; Roese 1997). People who engage in spontaneous counterfactual thinking tend to elaborate on better alternatives to past events (i.e., upward counterfactuals; Nasco and Marsh 1999; Roese 1997). Those idealized upward counterfactuals emerge in response to negative affect about past events (Markman et al. 1993; Roese 1997; Roese and Hur 1997). In a reciprocal way, they lead to even more negative affect, because the current reality seems worse in contrast to the idealized counterfactual past (affective contrast; Roese 1994; Roese and Morrison 2009).

Functional and dysfunctional counterfactuals

Functional accounts of counterfactuals focus on the preparative function of upward counterfactuals regarding intentions for future behavior (Epstude and Roese 2008; Roese 1994; Smallman and Roese 2009). Specifically, negative affect resulting from upward counterfactuals may motivate future behavior (Markman and McMullen 2003). However, one key moderator of the preparative function of counterfactuals is the repeatability of the event (Markman et al. 1993; see also Markman et al. 2009). Most studies on functional counterfactuals have therefore focused on repeatable tasks (e.g., Dyczewski and Markman 2012; Markman et al. 1993; Nasco and Marsh 1999; Roese 1994). In contrast, the present research focuses on real life counterfactual fantasies about lost opportunities, i.e. negative life events which are not repeatable but have passed and for which expectations of

still attaining the desired counterfactual alternative are low. Such counterfactuals are generated not only after controllable, but also after uncontrollable events, leading to self-blame, regret and anxiety (e.g., Branscombe et al. 2003; Callander et al. 2007; see also Branscombe et al. 1996). In middle-aged women, for example, excessive counterfactual thinking about lost opportunities was associated with emotional distress, depression, and anxiety (Landman et al. 1995). Or, in individuals who lost their child due to Sudden Infant Death Syndrome, the frequency of mentally undoing traumatic life events (e.g., "If I had grounded him that night as I wanted to, it might not have happened…", "If only I just woke the baby up when I got up…", respectively) was associated with reported distress and general ruminations (Davis et al. 1995, Study 2). That is, in the case of lost opportunities, counterfactuals do not serve a preparative function but are associated with distress, negative emotions, long-term regrets and, in turn, with difficulties in coping with negative life events (Markman et al. 2009; McMullen and Markman 2002; see also Sherman and McConnell 1995).

Counterfactual fantasies

Traditionally, counterfactuals have been defined as conditional prepositions, inherently evaluating both: the imagined alternative and factual reality (Byrne 2007). However, they can also represent simulation-based scenarios (*simulation-based* comparisons; Summerville and Roese 2008). Specifically, people might imagine counterfactuals as if they were real, yielding affective assimilation during the imagination (*"as if" thinking*; Markman and McMullen 2007, 2003; *reflective mode*; 2005; *experiential mode*; McMullen 1997). The effects of affective assimilation are similar to those of positive future fantasies, which are defined as free images of desired future events that occur in the stream of thought (vs. judgments of whether these events will occur or not; Oettingen 1999, 2012, 2014; Oettingen and Mayer 2002; Oettingen et al. 2016). In the present research, we therefore define counterfactual fantasies as free images of desired events or scenarios. Different from fantasies about a desired future, however, counterfactual fantasies pertain to events or scenarios that could have happened in the past.

Emotion-regulation of dysfunctional counterfactual fantasies

Regarding the negative emotional consequences of counterfactual fantasies, Davis and Lehman (1995) remind us that "we need to consider the important (and to our knowledge, empirically unstudied) issue of how people attempt to put counterfactuals behind them." (pp. 366–367). In order to come to terms with counterfactual fantasies about lost opportunities, emotion-regulation might be suitable (*emotion-focused coping*; Lazarus and Folkman 1984; or *secondary control coping*; Weisz et al. 1994). One way to attenuate negative emotions resulting from counterfactuals is to generate *downward counterfactuals*, that is, to simulate even less desired counterfactuals (Roese and Morrison 2009). One can also generate *semifactuals*, that is, counterfactual scenarios that would have led to the same negative outcome (McCloy and Byrne 2002). Findings on the regulatory mechanisms of downward counterfactuals as an emotion-focused coping strategy have, however, not been consistent (e.g., Mandel 2003). Aggravating the problem, people often not even try to use downward counterfactuals; rather they spontaneously engage in upward counterfactuals (Nasco and Marsh 1999; Summerville and Roese 2008). Especially after traumatic life events, they imagine how negative outcomes could have been prevented (i.e., how things could have turned out better; e.g., Davis et al. 1995).

We therefore searched for a strategy that attenuates negative emotions resulting from such upward counterfactual fantasies. Specifically, we focused on the self-regulation strategy of mental contrasting, because mental contrasting highlights the low probabilities of the idealized counterfactual past still coming true. By highlighting low probabilities, mental contrasting should provide insight that the past is forgone and cannot be brought back and thus help people to let go of the longed for alternative past. Therefore, the painful contrast between the idealized past and the current reality should melt down and with it the negative emotions accompanying this contrast. In sum, we investigated whether mental contrasting attenuates negative emotions resulting from positive counterfactual fantasies helping people to let go of their idealized, counterfactual past.

Mental contrasting

Fantasy realization theory (Oettingen 1999, 2012, 2014) identifies mental contrasting as a self-regulation strategy that helps people utilize their expectations of attaining a desired future. When people mentally contrast, they first imagine the attainment of the desired future, and thereafter elaborate on the critical obstacle of their current reality that stands in the way of attaining their desired future. Consequently, expectations of overcoming the obstacle and attaining the desired future become activated. In case of high expectations, people commit to the desired future and vigorously strive to attain it. In contrast, when expectations are low, people let go of attaining the desired future and are free to commit to more promising endeavors (Oettingen et al. 2001; review by Oettingen 2012).

The theory of fantasy realization specifies three other modes of thought about a desired future. People may engage in indulging (imagining only the attainment of the desired future), in dwelling (elaborating only on the current reality), or in reverse contrasting (elaborating on the current reality and then imagining the attainment of the desired future). In one-sided elaborations (i.e., indulging and dwelling), no discrepancy between the desired future and reality is created and thus expectations of success are not activated and cannot guide commitment to the desired future. In reverse contrasting, the relational construct of current reality *standing in the way* of attaining the desired future is not created, leading to no activation of expectations and thus to no changes in commitment to the desired future (review by Oettingen 2012).

Important in the context of the present research, mental contrasting helps people let go of wanting to attain their desired future when expectations of attaining the desired future are low (review by Oettingen 2012). Extrapolating those findings to positive fantasies about a counterfactual past, mental contrasting should help people realize that expectations of still attaining the desired counterfactual past are low, and thus people should let go of wanting to attain their desired counterfactual past. In contrast, the other three modes of thought (i.e., indulging in positive fantasies about the desired counterfactual past, dwelling on the current reality, or reverse contrasting positive counterfactual fantasies with current reality) should fail to make people realize that expectations of still attaining the counterfactual past are low. Therefore, these three modes of thought should keep people wanting to establish the desired counterfactual past (Oettingen et al. 2001; review by Oettingen 2012).

Previous research has shown that mental contrasting produces behavior change in line with expectations of attaining a desired future. Specifically, mental contrasting enables people to let go of their desired future by making it clear that the obstacle of current reality is difficult or impossible to overcome. That is, it leads people to acknowledge their expectations of attaining the desired future, rather than changing levels of expectations (see also Oettingen et al. 2001). Mental contrasting effects recruit cognitive and motivational mechanisms, which should similarly hold for mental contrasting of counterfactual fantasies.

Mental contrasting: mechanisms

Cognitive mechanisms

Regarding positive fantasies about a desired future, when expectations of attaining the desired future are low, mental contrasting weakens the implicit cognitive associations that spur attainment of the desired future. Specifically, mental contrasting weakens the implicit associations between the desired future and the obstacle of current reality. Now people can freely think about the desired future, without being reminded of the obstacle of current reality that needs to be overcome (Kappes and Oettingen 2014). Further, mental contrasting weakens the implicit associations between the obstacle of current reality and the instrumental means to overcome this obstacle. Now people do not allocate effort to overcome the obstacle of current reality (Kappes et al. 2012). Extrapolating those findings to positive fantasies about a desired counterfactual past, mental contrasting should weaken the implicit association between the desired counterfactual past and the obstacle of current reality that stands in the way of still attaining the desired counterfactual past. Further, mental contrasting should weaken the implicit associations between the obstacle of current reality and the instrumental means to overcome this obstacle. People should thus let go of wanting to attain the desired counterfactual past.

Motivational mechanisms

Regarding positive fantasies about a desired future, when expectations of attaining the desired future are low, mental contrasting weakens the implicit motivational processes that spur attainment of the desired future. Specifically, mental contrasting reduces people's mobilization of energy regarding their desired future as measured by self-report (Oettingen et al. 2009, Study 2) and by physiological indicators (Sevincer et al. 2014). Now people are free and can invest their energy in other, more promising endeavors. Again, extrapolating those findings to positive fantasies about a desired counterfactual past, mental contrasting, by reducing the energy to attain the desired counterfactual past, should enable people to invest their energy in more promising endeavors in their present life.

The present research

Mental contrasting has been shown to help people to let go of their desired future when expectations of success are low (review by Oettingen 2012). Extrapolating these findings to thinking about the past, we hypothesized that mental contrasting facilitates letting go of a lost alternative past, because expectations of still experiencing this past are low. Specifically, we should find that mental contrasting attenuates negative emotions that typically accompany the commitment to a lost counterfactual past. In six studies, participants were induced to mentally contrast their positive counterfactual fantasies with their current reality, to indulge in their positive counterfactual fantasies, to dwell on their current reality, or to reverse contrast their current reality with their positive counterfactual fantasies. We investigated mental contrasting effects on participants' disappointment

(Studies 1, 2, 3, and 4), post-decisional regret (Study 5), and interpersonal resentment and regret (Study 6).

Study 1: disappointment: mental contrasting vs. indulging

Studies 1–4 examined the effect of mental contrasting on people's commitment to their lost counterfactual past. We measured commitment by participants' levels of disappointment regarding their lost counterfactual past. Disappointment is an indirect indicator of commitment (*anticipated disappointment* in case a goal is not attained, e.g., Berger 1988; Brunstein and Gollwitzer 1996; Gollwitzer and Kirchhof 1998; Wicklund and Gollwitzer 1982), and mental contrasting has been found to reduce people's commitment (indicated by their anticipated disappointment in case of failure) when they had low expectations of success (Kappes and Oettingen 2014; Oettingen et al. 2001, Study 2). Disappointment (vs. relief) has also been investigated as a negative counterfactual emotion, experienced in situations in which a better counterfactual alternative to an outcome is envisioned (affective contrast effect; Roese 1994; see also Kahneman and Miller 1986).

In Study 1, we hypothesized that people who mentally contrast (vs. indulge) their positive counterfactual fantasies with their current reality should realize that expectations of attaining the counterfactual past are low. Thus, when asked to think about their counterfactual past compared with their current reality, they should be less disappointed, indicating reduced commitment to their counterfactual past.

Method study 1

Power analysis

Based on previous mental contrasting literature, we assumed that our experimental manipulation should exert a large effect ($f = 0.40$, $d = 0.80$). We applied this effect size to an a priori power analysis for two groups within an ANOVA. The power analysis indicated that approximately 84 participants would be needed to achieve 95% power ($1 - \beta$) at a 0.05 alpha level ($\alpha = 0.05$). In Study 1, we recruited 97 participants.

Participants

Ninety-seven participants (44 females) completed the study online via Amazon's Mechanical Turk (MTurk). Participants were 21–78 years old (Mage = 39.19, SDage = 12.78). They were randomly assigned to either a mental contrasting ($n = 50$) or an indulging condition ($n = 47$). All participants were told that they would take part in a survey about how people think about the past. The procedure and materials were approved by the ethical review committee of the University of Hamburg, Germany.

Procedure and materials

Mental exercise

All participants were introduced to the topic of counterfactual fantasies by naming a scenario of which they thought that it would have made their life better overall. More specifically, all participants read:

> People often think about hypothetical scenarios that could have happened in their past and of which they think that they would have been for the better. Examples of those scenarios could be: "If only I had married that man/woman", "If only I had traveled more", "If only I had settled down to family life", "If only this negative event had not happened" etc. Is there any scenario of your past about which you think pretty frequently and of which you cannot stop thinking that this scenario would have made your life much better?

Participants named, for example, "If only I had gotten a PhD", or "If only my partner would have stayed with me". After naming a scenario, participants indicated how often they thought about it ("How often do you think about the positive scenario you just named?") using a scale from 1 (*rarely*) to 7 (*all the time*), the desirability of the scenario ("How desirable would the scenario have been?"), and their expectations of the scenario still becoming reality ("How likely do you think it is that the positive scenario you just named can still become reality?"). Scales reached from 1 (*not at all desirable/not at all likely*) to 7 (*very desirable/very likely*).

Thereafter, participants in the mental contrasting and indulging conditions were asked to name the best aspect they associated with the scenario (participants named e.g., "I would have had more doors open", or "Happiness") and to elaborate on this aspect:

> Think about the best positive aspect you just named in more detail. Elaborate on the respective events or experiences of the scenario in your thoughts as intensively as possible! Let the mental images pass by in your thoughts and do not hesitate to give your thoughts and images free reign. Take as much time and space as you need to imagine and write down your thoughts and images.

Whereas participants in the indulging condition then had to name the second best aspect they associated with the scenario and elaborated on this positive aspect,

Table 1 Disappointment and global negative affect in the mental contrasting, indulging, dwelling, and control conditions: Study 1 and Study 2

Variable	MC		Indulging		Dwelling		Control		*df*	*F*	*p*	ω^2
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*				
Study 1												
Disappointment	3.94	1.62	4.85	1.47					95	8.35	.005	0.07
Global negative affect	3.76	1.39	4.38	1.36					95	4.93	.03	0.04
Study 2												
Disappointment	3.40	1.69	4.45	1.87	4.24	1.67	4.28	2.02	214	3.89	.01	0.04
Global negative affect	3.28	1.44	4.11	1.68	4.06	1.42	4.07	1.64	214	3.96	.009	0.04

High scores indicate high levels of disappointment and negative affect, with scores ranging from 1 to 7. Reliabilities of the global negative affect scales were Cronbach's $\alpha = 0.96$ (Study 1), and Cronbach's $\alpha = 0.95$ (Study 2)

MC mental contrasting

participants in the mental contrasting condition were asked to name the main obstacle of their current reality that hindered their positive scenario from becoming true. Participants named, for example, "Lack of money", or "It's too late". They were then asked to elaborate on this obstacle:

> Now think about the obstacle you just named in more detail. What is it exactly in the here and now that hinders you from realizing your wished-for scenario? Elaborate on the main obstacle as intensively as possible! Let the mental images pass by in your thoughts and do not hesitate to give your thoughts and images free reign. Take as much time and space as you need to imagine and write down your thoughts and images.

Disappointment

Following the procedure of Roese (1994), we assessed participants' disappointment by asking them how thinking about the positive scenario which they named in the beginning of the experiment made them feel *right now*. Participants indicated their answers on a scale ranging from 1 (*disappointed*) to 7 (*relieved*). Identical to Roese (1994), we also assessed four other affect ratings (i.e., *depressed–elated, negative–positive, unhappy–happy, hostile–agreeable*). However, we focused on disappointment in our analysis since disappointment reflects an indirect indicator of commitment and has been shown to be affected by mental contrasting in previous research (Kappes and Oettingen 2014; Oettingen et al. 2001, Study 2). We reverse coded all scales so that high scores indicate high levels of disappointment and negative affect. Means for disappointment and global negative affect (i.e., the average of all five affect ratings) are reported in Table 1.

Control variables

Mood

The Brief Mood Introspection Scale (BMIS; Mayer and Gaschke 1988) was administered two times during the experiment, serving as an indicator of participants' baseline mood at the beginning of the experiment and after the mental exercise. The mood measure was included two times in the experiment in order to rule out any mood differences between the mental contrasting and indulging conditions at the beginning of the experiment and to ensure that possible experimental effects of mental contrasting vs. indulging on disappointment would hold beyond participants' levels of general mood. The BMIS is a 16-item scale consisting of mood adjectives with two items belonging to one of eight mood states (e.g., happy: "happy", "lively"; calm: "calm", "content"; sad: "gloomy", "sad"). Participants were asked to indicate how well each adjective described their current mood state on a 4-point scale ranging from 1 (*definitely do not feel*) to 4 (*definitely feel*). Participants' mood was assessed along two subscales (i.e. *pleasant–unpleasant* and *positive–tired*).

Coping self-efficacy

Positive counterfactuals have been associated with distress and negative affect, which in turn has been associated with difficulties in coping with negative life events (e.g., Davis et al. 1995). We aimed to ensure that possible experimental effects of mental contrasting vs. indulging on disappointment would hold beyond participants' trait coping self-efficacy. We thus assessed participants' trait coping self-efficacy in the beginning of the experiment. Specifically, we administered the Coping Self-Efficacy (CSE) scale (Chesney et al. 2006). The CSE scale consists of 26 items for which participants rated the extent to which they believe they can perform adaptive coping behaviors (e.g., 'When things aren't going

well for you, or when you're having problems, how confident are you that you can: *Look for something good in a negative situation*'). Scale anchor points were 0 (*cannot do at all*), 5 (*moderately certain can do*), and 10 (*certain can do*).

Trait regret

Counterfactuals have been associated with feelings of regret (e.g., Branscombe et al. 2003). Therefore, we wanted to ensure that possible experimental effects of mental contrasting vs. indulging on disappointment would hold beyond participants' trait regret levels. In order to assess participants' trait to experience regret, we administered the Regret Scale developed by Schwartz et al. (2002), both as a baseline measure and after the mental exercise. The Regret Scale consists of five statements (e.g., 'Whenever I make a choice, I'm curious about what would have happened if I had chosen differently') and participants were asked to indicate their agreement to those statements on a scale ranging from 1 (*completely disagree*) to 7 (*completely agree*).

Trait resentment

After negative life events, positive counterfactuals are associated with feelings of resentment (see Sherman and McConnell 1995). We thus tried to ensure that possible experimental effects of mental contrasting vs. indulging on disappointment would hold beyond participants' trait resentment levels. We assessed participants' trait levels of resentment, both at baseline and after the mental exercise using eight items from the Gratitude Resentment and Appreciation Test (GRAT-R) developed by Watkins et al. (2003). The short-form GRAT-R consists of 16 items of which we picked eight items that assessed participants' general resentment levels (e.g., 'It sure seems that others get a lot more benefits in life than I do' (reverse scored), 'Life has been good to me'). Participants were asked to indicate their level of agreement to eight statements on a scale with anchor points of 1 (*I strongly disagree*), 5 (*I feel neutral about the statement*), and 9 (*I strongly agree*).

Results study 1

Thought frequency

Average frequency of thoughts about the positive counterfactual scenarios reached from several times a month to weekly, with no significant difference between the mental contrasting ($M = 3.25$, $SD = 1.90$) and indulging conditions ($M = 3.25$, $SD = 1.90$), $F(1, 95) = 0.00$, $p = .95$.

Desirability and expectations

The counterfactual scenarios were rated as desirable, with no significant difference between the mental contrasting ($M = 5.94$, $SD = 1.28$) and indulging conditions ($M = 6.17$, $SD = 1.01$), $F(1, 95) = 0.96$, $p = .33$. Desirability of the scenarios correlated positively with thought frequency, $r(96) = .35$, $p < .001$, 95% CI [0.19, 0.49], with people rating their scenario as highly desirable also reporting a high frequency of thoughts about it. On average, expectations of the scenario still becoming reality were, as expected, low, with no significant difference between the mental contrasting ($M = 3.12$, $SD = 2.22$) and indulging conditions ($M = 2.85$, $SD = 2.34$), $F(1, 95) = 0.34$, $p = .56$.

Dependent variable: disappointment

We submitted the disappointment scores to a one-way ANOVA with condition (mental contrasting vs. indulging) as fixed between-subject factor. There was a significant effect of condition, $F(1, 95) = 8.35$, $p = .005$, $\omega^2 = 0.07$. Participants who mentally contrasted their positive counterfactual scenarios with their current reality felt less disappointed ($M = 3.94$, $SD = 1.62$) compared with participants who indulged in their positive counterfactual scenarios ($M = 4.85$, $SD = 1.47$), $p = .005$, 95% CI [−1.54, −0.29], when asked how thinking about their positive scenario made them feel right now (Table 1). The obtained experimental effect of condition on disappointment remained significant, $F(1, 90) = 11.07$, $p = .001$, when we entered our control variables (i.e., the change scores of pleasant and positive mood, coping self-efficacy, trait measures of regret and resentment) as covariates into the analysis.

Discussion study 1

Whereas participants who indulged in their positive counterfactual fantasies experienced disappointment when asked how thinking about the positive counterfactual past made them feel right now, those in the mental contrasting condition experienced less disappointment. Those results speak to the fact that mental contrasting (vs. indulging) led people to let go of their counterfactual past. In line with the findings of Roese (1994, Study 2), we obtained a significant effect of mental contrasting on the global negative affect measure, with the strongest effect on the disappointment item (see Table 1) speaking to the fact that mental contrasting (vs. indulging) reduced people's commitment to their counterfactual past.

In Study 1, participants in the mental contrasting condition elaborated on a positive aspect of their counterfactual scenario and on the obstacle of their current reality, whereas

participants in the indulging condition elaborated on two positive aspects of their counterfactual scenario. Thus, the amount of elaboration was held constant across the two conditions. One might argue, however, that the two conditions differed by their amount of fantasizing and that this might have driven the observed effect on disappointment. In order to rule out this explanation, in Study 2 we included two additional control conditions in which participants either elaborated on two obstacles of their current reality (dwelling condition), or elaborated on irrelevant content (control condition). Similar to indulging, dwelling and elaborating on irrelevant content should not make people realize their low expectations of still attaining their counterfactual past and should thus leave their commitment to attain their counterfactual past unchanged.

Further, in Study 1, we let participants freely name a positive counterfactual fantasy they frequently engaged in in everyday life. People tend to engage in counterfactual fantasies not only after controllable, but also after uncontrollable events (e.g., Davis et al. 1995; Callander et al. 2007). Importantly, controllability here refers to how controllable the actual negative event was at the time it happened rather than the repeatability of the event in the here and now. In Study 2 we aimed to conceptually replicate the findings of Study 1, and to extend those findings regarding counterfactual alternatives to events that participants deemed uncontrollable at the time.

Study 2: disappointment: mental contrasting vs. indulging, dwelling, control

We hypothesized that in comparison to indulging, mental contrasting should lead people to experience less disappointment, indicating reduced commitment to the counterfactual past. We reasoned that this pattern of results would hold even if the actual negative events were caused by uncontrollable factors. Finally, we included two additional conditions: a dwelling condition in which participants only elaborated on their current reality, and an additional control condition in order to investigate the direction of effects. In the control condition, participants named a positive counterfactual scenario, but elaborated on irrelevant content.

Method study 2

Power analysis

As we observed a large effect of mental contrasting in Study 1, we based our power analysis on the assumption that the experimental manipulation should again exert a large effect ($f = 0.40$, $d = 0.80$). Applying this effect size to a power analysis of a one-way ANOVA with four groups indicated that approximately 200 participants would be needed to achieve 99.9% power ($1 - \beta$) at a 0.05 alpha level ($\alpha = 0.05$). In Study 2, we recruited 218 participants.

Participants

Two hundred eighteen participants (133 females) completed the study online via Amazon's Mechanical Turk (MTurk). Participants were 20–77 years old (Mage = 41.27, SDage = 13.58). They were randomly assigned to one of four conditions: mental contrasting ($n = 62$), indulging ($n = 49$), dwelling ($n = 50$), or control ($n = 57$). All participants were told that they would take part in a survey about how people think about the past. The procedure and materials were approved by the ethical review committee of the University of Hamburg, Germany.

Procedure and materials

Mental exercise

Instructions of the mental exercise were those described in Study 1. However, participants were introduced to the topic of counterfactual fantasies by being asked to name an alternative to a negative past event which was not controllable at the time and of which they think that this alternative would have made their life much better. Participants named, for example, "If only I had been blessed with good health", or "If only my dad hadn't died". Participants in the indulging condition were asked to name and elaborate on two positive aspects they associated with the alternative scenario (e.g., "A happier life", "My kids would have gotten to know their grandpa"), whereas participants in the dwelling condition had to name and elaborate on two obstacles standing in the way of realizing their counterfactual scenario (participants named, e.g., "You can't undo death", "Can't go back in time"). Participants in the mental contrasting condition first named and elaborated on a positive aspect of their counterfactual scenario and thereafter named and elaborated on the main obstacle standing in the way of their counterfactual scenario coming true. Participants in the control condition named a positive counterfactual scenario and were then asked to elaborate on how a regular Saturday morning runs off.

Disappointment

We assessed participants' disappointment like in Study 1. Participants were asked how thinking about the positive scenario which they named in the beginning of the experiment made them feel *right now*. High scores indicate high levels

of disappointment. Means for both disappointment and the global negative affect measure are depicted in Table 1.[1]

Results study 2

Thought frequency

Average frequency of thoughts about the positive scenarios ranged from several times a month to weekly, with no significant difference between the four conditions (mental contrasting $M = 3.63$, $SD = 1.96$; indulging $M = 3.92$, $SD = 2.38$; dwelling $M = 3.62$, $SD = 1.87$; control $M = 3.30$, $SD = 2.11$), $F(3, 214) = 0.79$, $p = .50$.

Desirability and expectations

The counterfactual scenarios were rated as desirable, with no significant difference between the four conditions (mental contrasting $M = 5.76$, $SD = 1.57$; indulging $M = 5.86$, $SD = 1.61$; dwelling $M = 6.06$, $SD = 1.58$; control $M = 5.72$, $SD = 1.72$), $F(3, 214) = 0.47$, $p = .71$. The desirability of the scenarios correlated positively with the frequency of thoughts, $r(217) = .22$, $p = .001$, 95% CI [0.09, 0.35], with people who reported a higher frequency of thoughts about their scenario also rating the latter as more desirable. Expectations were low, with no significant difference between the four conditions (mental contrasting $M = 3.26$, $SD = 2.40$; indulging $M = 3.16$, $SD = 2.31$; dwelling $M = 2.82$, $SD = 2.18$; control $M = 2.95$, $SD = 2.30$), $F(3, 214) = 0.41$, $p = .75$.

Dependent variable: disappointment

We submitted the disappointment scores to a one-way ANOVA with condition (mental contrasting vs. indulging vs. dwelling vs. control) as fixed between-subject factor. There was a significant effect of condition, $F(3, 214) = 3.89$, $p = .01$, $\omega^2 = 0.04$. Participants who mentally contrasted their positive counterfactual scenarios with their current reality felt less disappointed ($M = 3.40$, $SD = 1.69$) compared with participants who indulged in their positive counterfactual scenarios ($M = 4.45$, $SD = 1.87$), $p = .003$, 95% CI [0.36, 1.73], compared with participants who dwelled on their current reality ($M = 4.24$, $SD = 1.67$), $p = .02$, 95% CI [0.16, 1.52], and compared with participants in the control condition ($M = 4.28$, $SD = 2.02$), $p = .009$, 95% CI [0.22, 1.54] when thinking about their counterfactual alternatives. There were no significant differences in disappointment between the three other conditions, p's > 0.63 (Table 1). The obtained experimental effect remained significant when we entered our control variables (i.e. change scores of pleasant and positive mood, coping self-efficacy, trait regret, trait resentment, and depression) as covariates into the analysis, $F(3, 208) = 4.35$, $p = .005$.

Discussion study 2

After uncontrollable negative events, mental contrasting of positive counterfactual alternatives with current reality (vs. indulging, dwelling, or elaborating on irrelevant content) helped to attenuate disappointment, indicating reduced commitment to the counterfactual past. Thus, we conceptually replicated the findings of Study 1, and also showed that mental contrasting attenuates disappointment about the counterfactual past, rather than indulging and dwelling heightening it.

One might argue that the emotional dynamics in the mental contrasting condition are different from those in the indulging and dwelling conditions. That is, whereas in the mental contrasting condition, participants elaborate on both the idealized counterfactual past and the current reality, participants in the indulging and dwelling conditions solely elaborate on either the counterfactual past or the current reality. Thus, whereas in the mental contrasting condition, an association is created between the lost counterfactual past and current reality, this should not take place in the indulging and dwelling conditions. In order to rule out this explanation, in Study 3 we aimed to replicate the findings of Study 2, and included a reverse contrasting condition, in which participants elaborated on the exact same content as mental contrasting participants, but in reversed order. Like mental contrasting, reverse contrasting should make both the concepts of the desired counterfactual past and of current reality simultaneously accessible. Unlike mental contrasting, however, reverse contrasting should not activate the relational construct of the current reality as an obstacle *standing in the way* of attaining the desired counterfactual past (see Oettingen et al. 2001). Therefore, in reverse contrasting, low expectations should not be activated and commitment to the counterfactual past should be unchanged.

Study 3: disappointment: mental contrasting vs. reverse contrasting, control

We hypothesized that participants in the mental contrasting condition (vs. reverse contrasting or control) should experience less disappointment, indicating reduced commitment

[1] In Studies 2–6, we assessed the same control variables as in Study 1, including an additional measure of participants' levels of depression (revised Center for Epidemiologic Depression Scale, CESD-R; Eaton et al. 2004) in order to ensure that our experimental effects would also hold beyond participants' levels of depressive symptoms.

Table 2 Disappointment and global negative affect in the mental contrasting, reverse contrasting, and control conditions: Study 3 and Study 4

Variable	MC		RC		Control		*df*	*F*	*p*	ω^2
	M	*SD*	*M*	*SD*	*M*	*SD*				
Study 3										
Disappointment	3.22	1.87	3.95	1.77	3.75	1.61	284	4.57	.01	0.02
Global negative affect	3.10	1.55	3.71	1.61	3.52	1.46	284	4.19	.02	0.02
Study 4										
Disappointment	3.41	1.75	4.00	1.75	4.16	1.85	264	4.42	.01	0.02
Global negative affect	3.30	1.61	3.87	1.61	3.78	1.51	264	3.25	.04	0.02

High scores indicate high levels of disappointment and negative affect, with scores ranging from 1 to 7. Reliabilities of the global negative affect scales were Cronbach's α = 0.96 (Study 3), and Cronbach's α = 0.95 (Study 4)

MC mental contrasting, *RC* reverse contrasting

to the counterfactual past. Like in Study 2, we asked participants to generate negative events that they deemed uncontrollable at the time.

Method study 3

Power analysis

Following the previous two studies, we based our power analysis on the assumption that the experimental manipulation should exert a large effect ($f = 0.40$, $d = 0.80$). Applying this effect size to a power analysis of a one-way ANOVA with three groups indicated that approximately 186 participants would be needed to achieve 99.9% power ($1 - \beta$) at a 0.05 alpha level ($\alpha = 0.05$). In Study 3, we recruited 287 participants.

Participants

Two hundred eighty-seven participants (191 females) completed the study online via Amazon's Mechanical Turk (MTurk). Participants were aged 18–72 years (Mage = 37.03, SDage = 12.49). Participants were randomly assigned to either a mental contrasting ($n = 103$), a reverse contrasting ($n = 101$), or a control condition ($n = 83$). All participants were told that they would take part in a survey about how people think about the past. The procedure and materials were approved by the ethical review committee of the University of Hamburg, Germany.

Procedure and materials

Mental exercise

Instructions of the mental exercise were those described in Study 1. However, participants were introduced to the topic of counterfactual fantasies by being asked to name an alternative to a negative past event which was not controllable at the time. Participants named, for example, "If only my parents hadn't been fighting". Participants in the mental contrasting condition first named and elaborated on a positive aspect of their counterfactual scenario (e.g., "Happiness") and thereafter named and elaborated on the main obstacle standing in the way of their counterfactual scenario coming true (e.g., "Time has passed"). Participants in the reverse contrasting condition first named and elaborated on the main obstacle and thereafter named and elaborated on a positive aspect of their counterfactual scenario. Participants in the control condition elaborated on how a regular Saturday morning runs off.

Disappointment

We assessed participants' disappointment identically to Study 1. Participants were asked how thinking about the positive scenario which they named in the beginning of the experiment made them feel *right now*. Following the procedure used by Roese (1994) and in contrast to Studies 1 and 2, we placed the disappointed-relieved item first within the affect scale in order to ensure a more sensitive test of the hypothesis. High scores indicate high levels of disappointment. Means for both disappointment and the global negative affect measure are depicted in Table 2.

Results study 3

Thought frequency

Average frequency of thoughts about the positive scenarios ranged from several times a month to weekly, with no significant difference between the mental contrasting ($M = 3.73$, $SD = 2.09$), reverse contrasting ($M = 4.24$, $SD = 2.22$), or control conditions ($M = 3.82$, $SD = 2.06$), $F(2, 284) = 1.63$, $p = .20$.

Desirability and expectations

The counterfactual scenarios were rated as desirable, with no significant difference between the mental contrasting ($M = 5.94$, $SD = 1.45$), reverse contrasting ($M = 5.66$, $SD = 1.85$), or control conditions ($M = 5.65$, $SD = 1.76$), $F(2, 284) = 0.94$, $p = .39$. The desirability of the scenarios correlated positively with the frequency of thoughts, $r(286) = .34$, $p < .001$, 95% CI [0.23, 0.44], with people who reported a higher frequency of thoughts about their scenario also rating the latter as more desirable. Expectations were moderate, with no significant difference between the mental contrasting ($M = 4.61$, $SD = 2.35$), reverse contrasting ($M = 4.33$, $SD = 2.40$), or control conditions ($M = 4.42$, $SD = 2.35$), $F(2, 284) = 0.38$, $p = .68$.

Dependent variable: disappointment

We submitted the disappointment scores to a one-way ANOVA with condition (mental contrasting vs. reverse contrasting vs. control) as fixed between-subject factor. There was a significant effect of condition, $F(2, 284) = 4.57$, $p = .01$, $\omega^2 = 0.02$. Participants who mentally contrasted their positive counterfactual scenarios with their current reality felt less disappointed ($M = 3.22$, $SD = 1.87$) compared with participants who reverse contrasted ($M = 3.95$, $SD = 1.77$), $p = .004$, 95% CI [0.24, 1.21], and compared with participants in the control condition ($M = 3.75$, $SD = 1.61$), $p = .05$, 95% CI [0.01, 1.04] when thinking about their counterfactual alternatives. There was no significant difference in disappointment between the two other conditions, $p = .44$ (Table 2). The obtained experimental effect remained significant when we entered our control variables (i.e. change scores of pleasant and positive mood, coping self-efficacy, trait regret, trait resentment, and depression) as covariates into the analysis, $F(2, 278) = 3.85$, $p = .02$.

Discussion study 3

After uncontrollable negative events, mental contrasting of positive counterfactual alternatives with current reality (vs. reverse contrasting or elaborating on irrelevant content) helped to attenuate disappointment, indicating reduced commitment to the counterfactual past. Participants who reverse contrasted elaborated on identical content but did not let go of their counterfactual past, as indicated by their relatively higher disappointment about the counterfactual past. These findings speak to mental contrasting achieving its effects by leading people to interpret their current reality as an obstacle standing in the way of still attaining the idealized counterfactual past. In Study 4, we aimed to replicate the findings of Study 3, and to extent those findings to controllable events.

Study 4: disappointment: mental contrasting vs. reverse contrasting, control (conceptual replication)

We hypothesized that participants in the mental contrasting condition (vs. reverse contrasting or control) should experience less disappointment, indicating reduced commitment to the counterfactual past. In contrast to Study 3, in Study 4 we asked participants to name negative events that they felt were in their own control.

Method study 4

Power analysis

We based our power analysis on the assumption that the experimental manipulation should exert a large effect ($f = 0.40$, $d = 0.80$). Applying this effect size to a power analysis of a one-way ANOVA with three groups indicated that approximately 186 participants would be needed to achieve 99.9% power ($1 - \beta$) at a 0.05 alpha level ($\alpha = 0.05$). In Study 4, we recruited 267 participants.

Participants

Two hundred sixty-seven participants (163 females) completed the study online via Amazon's Mechanical Turk (MTurk). Participants were 19–83 years old (Mage = 37.24, SDage = 13.19). Participants were randomly assigned to either a mental contrasting ($n = 85$), a reverse contrasting ($n = 70$), or a control condition ($n = 112$). All participants were told that they would take part in a survey about how people think about the past. The procedure and materials were approved by the ethical review committee of the University of Hamburg, Germany.

Procedure and materials

Mental exercise

Instructions of the mental exercise were those described in Study 1. However, participants were introduced to the topic of counterfactual fantasies by being asked to name an alternative to a negative past event which was controllable. Participants named, for example, "If only I had gone to college". Participants in the mental contrasting condition first named and elaborated on a positive aspect of their counterfactual scenario (e.g., "More knowledge") and thereafter named and elaborated on the main obstacle standing in the way of their counterfactual scenario coming true (e.g., "No money anymore"). Participants in the reverse contrasting condition first named and elaborated on the main obstacle

and thereafter named and elaborated on a positive aspect of their counterfactual scenario. Participants in the control condition elaborated on how a regular Saturday morning runs off.

Disappointment

We assessed participants' disappointment in the same way as in Study 1. Participants rated how thinking about the positive scenario which they named in the beginning of the experiment made them feel *right now*. We again placed the disappointed-relieved item first within the affect scale. High scores indicate high levels of disappointment. Means for both disappointment and the global negative affect measure are depicted in Table 2.

Results study 4

Thought frequency

Average frequency of thoughts about the positive scenarios ranged from several times a month to weekly, with no significant difference between the mental contrasting ($M = 4.01$, $SD = 2.03$), reverse contrasting ($M = 3.77$, $SD = 2.02$), or control conditions ($M = 3.93$, $SD = 2.09$), $F(2, 264) = 0.27$, $p = .77$.

Desirability and expectations

The counterfactual scenarios were rated as desirable, with no significant difference between the mental contrasting ($M = 6.04$, $SD = 1.27$), reverse contrasting ($M = 5.69$, $SD = 1.62$), or control conditions ($M = 5.64$, $SD = 1.52$), $F(2, 264) = 1.91$, $p = .15$. The desirability of the scenarios correlated positively with the frequency of thoughts, $r(266) = .32$, $p < .001$, 95% CI [0.21, 0.44], with people who reported a higher frequency of thoughts about their scenario also rating the latter as more desirable. Expectations were moderate, with no significant difference between the mental contrasting ($M = 4.66$, $SD = 2.22$), reverse contrasting ($M = 4.26$, $SD = 2.46$), or control conditions ($M = 4.06$, $SD = 2.34$), $F(2, 264) = 1.60$, $p = .21$.

Dependent variable: disappointment

We submitted the disappointment scores to a one-way ANOVA with condition (mental contrasting vs. reverse contrasting vs. control) as fixed between-subject factor. There was a significant effect of condition, $F(2, 264) = 4.42$, $p = .01$, $\omega^2 = 0.02$. Participants who mentally contrasted their positive counterfactual scenarios with their current reality felt less disappointed ($M = 3.41$, $SD = 1.75$) compared with participants who reverse contrasted ($M = 4.00$, $SD = 1.75$), $p = .04$, 95% CI [0.02, 1.16], and compared with participants in the control condition ($M = 4.16$, $SD = 1.85$), $p = .004$, 95% CI [0.25, 1.26] when thinking about their counterfactual alternatives. There was no significant difference in disappointment between the two other conditions, $p = .56$ (Table 2). The obtained experimental effect remained significant when we entered our control variables (i.e. change scores of pleasant and positive mood, coping self-efficacy, trait regret, trait resentment, and depression) as covariates into the analysis, $F(2, 258) = 3.25$, $p = .04$.

Discussion study 4

So far, we demonstrated that mental contrasting (vs. relevant control conditions) helped people to let go of their counterfactual past, as indicated by reduced disappointment about the counterfactual past. Participants who mentally contrasted let go from their counterfactual past, irrespective of whether this counterfactual past pertained to a controllable or uncontrollable negative event. Hence, mental contrasting should also attenuate other negative emotions that typically accompany counterfactual fantasies. As an example, counterfactuals about alternatives to events for which people feel that they were responsible have been found to lead to feelings of regret (Zeelenberg et al. 1998; see also Zeelenberg and Pieters 2007; Markman et al. 2009). Regret, in turn, has been associated with poor well-being (Jokisaari 2004; Lecci et al. 1994; see also Schwartz et al. 2002). In Study 5, we investigated whether mentally contrasting counterfactual fantasies about a better alternative which participants could have chosen reduces their levels of post-decisional regret.

Study 5: post-decisional regret: mental contrasting vs. indulging, dwelling

We hypothesized that people who mentally contrast their counterfactual fantasies about an alternative better decision with current reality should experience less post-decisional regret compared to people who merely indulge in counterfactual fantasies about an alternative better decision and to people who dwell on their current reality.

Method study 5

Power analysis

We based our power analysis on the mean ($f = 0.44$) of the effect sizes observed in Study 1 ($f = 0.45$) and Study 2 ($f = 0.42$). We assumed that the experimental manipulation

should exert an effect comparable to Studies 1 and 2. Applying this effect size to a power analysis of a one-way ANOVA with three groups indicated that approximately 114 participants would be needed to achieve 99% power ($1-\beta$) at a 0.05 alpha level ($\alpha = 0.05$). In Study 5, we recruited 130 participants.

Participants

One hundred thirty participants (54 females) completed the study online via Amazon's Mechanical Turk (MTurk). Participants were aged 21–70 years (Mage = 39.02, SDage = 11.80). Participants were randomly assigned to either a mental contrasting ($n = 50$), an indulging condition ($n = 39$), or a dwelling condition ($n = 41$). All participants were told that they would take part in a survey about how people think about the past. The procedure and materials were approved by the ethical review committee of the University of Hamburg, Germany.

Procedure and materials

Mental exercise

Instructions of the mental exercise were those described in Study 1, except that participants were introduced to the topic of counterfactual fantasies by naming an alternative to a past decision of which they think that this alternative would have made their life much better. Participants named, for example, "If I had attended a different university", or "If I only had stayed with a particular job". Participants in the indulging condition thereafter named and elaborated on two positive aspects they associated with the alternative scenario (e.g., "It was my dream school", "I would be better off financially"), whereas participants in the dwelling condition had to name and elaborate on two obstacles of their current reality standing in the way of realizing their counterfactual scenario (participants named, e.g., "No money anymore", "Job no longer available"). Participants in the mental contrasting condition first named and elaborated on a positive aspect of their counterfactual scenario and thereafter named and elaborated on the main obstacle of their current reality standing in the way of realizing their counterfactual scenario.

Post-decisional regret

In order to measure post-decisional regret, we administered the Decision Regret Scale (Brehaut et al. 2003). Participants were asked to think again about the decision they actually made. They then responded to five statements regarding their decision, for example 'The choice did me a lot of harm' (reverse scored). Participants were asked to indicate their level of agreement with the statements on a scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). High scores on the scale reflect high levels of post-decisional regret.

Results study 5

Thought frequency

Average frequency of thoughts about the positive scenarios reached from several times a month to weekly, with no significant difference between the mental contrasting ($M = 3.40$, $SD = 1.80$), indulging ($M = 3.62$, $SD = 1.90$), or dwelling conditions ($M = 2.98$, $SD = 1.65$), $F(2, 127) = 1.35$, $p = .26$.

Desirability and expectations

The counterfactual scenarios were rated as desirable, with no significant difference between the mental contrasting ($M = 5.56$, $SD = 1.39$), indulging ($M = 6.10$, $SD = 1.35$), or dwelling conditions ($M = 5.68$, $SD = 1.23$), $F(2, 127) = 1.93$, $p = .15$. Desirability of the counterfactual scenarios correlated positively with the frequency of thoughts, $r(129) = .27$, $p = .002$, 95% CI [0.12, 0.42], with people who reported a higher frequency of thoughts about their counterfactual scenarios also rating the latter as more desirable. Expectations were low to moderate, with no significant difference between the mental contrasting ($M = 3.46$, $SD = 2.42$), indulging ($M = 3.56$, $SD = 2.39$), or dwelling conditions ($M = 3.63$, $SD = 2.20$), $F(2, 127) = 0.06$, $p = .94$.

Dependent variable: post-decisional regret

We submitted the scores of post-decisional regret to a one-way ANOVA with condition (mental contrasting vs. indulging vs. dwelling) as fixed between-subject factor. There was a significant effect of condition, $F(2, 127) = 8.10$, $p < .001$, $\omega^2 = 0.10$ on post-decisional regret. Participants in the mental contrasting condition reported lower levels of post-decisional regret ($M = 2.64$, $SD = 0.96$) compared with participants in the indulging condition ($M = 3.45$, $SD = 0.98$), $p < .001$, 95% CI [0.40, 1.21], and compared with participants in the dwelling condition ($M = 3.16$, $SD = 0.94$), $p = .01$, 95% CI [0.11, 0.91]. There was no significant difference in levels of post-decisional regret between the indulging and dwelling conditions, $p = .17$. (Table 3). The obtained experimental effect of condition on post-decisional regret remained significant when we entered our control variables (i.e. change scores of pleasant and positive mood, coping self-efficacy, trait regret, trait resentment, and depression) as covariates into the analysis, $F(2, 121) = 5.36$, $p = .006$.

Table 3 Post-decisional regret, interpersonal resentment, and regret in the mental contrasting, indulging, and dwelling conditions: Study 5 and Study 6

Variable	MC		Indulging		Dwelling		*df*	*F*	*p*	ω^2
	M	*SD*	*M*	*SD*	*M*	*SD*				
Study 5										
Post-Decisional Regret[a]	2.64	0.96	3.45	0.98	3.16	0.94	127	8.10	< .001	0.10
Study 6										
Interpersonal resentment[b]	4.41	1.23	5.14	1.26	5.18	1.07	113	5.32	.006	0.07
Regret[c]	2.92	1.18	3.60	1.02	3.32	1.21	110	3.29	.04	0.04

MC mental contrasting

[a]High scores indicate high levels of post-decisional regret, with scores ranging from 1 to 5

[b]High levels of interpersonal resentment, with scores ranging from 1 to 9

[c]High levels of regret, with scores ranging from 1 to 5

Discussion study 5

Participants who mentally contrasted their counterfactual fantasies about a better, alternative decision with their current reality felt less post-decisional regret when they were asked to think again about the actual decision they made as compared to one-sided elaborations (i.e., indulging and dwelling). Expectations of revoking the made decision and still attaining the counterfactual alternative were low to moderate in the present study. Reduction of post-decisional regret should therefore be a suitable approach after such negative real-life outcomes (i.e., *emotion-focused coping*, e.g., Lazarus and Folkman 1984).

Although it has been suggested that people are particularly inclined to experience regret about events that are repeatable and thus entail future opportunities to correct behavior (*opportunity principle*; Roese and Summerville 2005), recent research has shown that this might not always be the case (e.g., Epstude and Jonas 2015). In fact, Beike, Markman, and Karadogan (2009) showed that the biggest regrets are actually experienced for lost opportunities that can no longer be changed or revoked. In line with the findings of Beike et al. (2009), we argue that in some cases, regret serves behavior regulation (see also Roese et al. 2007) and can thus be helpful in guiding people's future behavior after aversive outcomes. For lost opportunities, however, regret is not beneficial, but rather leads to reduced life satisfaction and coping difficulties (Beike and Crone 2008; Lecci et al. 1994; see also Markman et al. 2009). The findings suggest that mental contrasting is a self-regulatory tool to attenuate people's regret about lost opportunities.

In everyday life, people not only experience regret after events for which they were responsible, but also in response to events for which they were not responsible. In those cases, counterfactuals may lead to negative emotions such as resentment, and in addition to self-blame which should in turn lead to feelings of regret (e.g., Branscombe et al. 2003; Davis et al. 1996; Janoff-Bulman 1979). In Study 6, we focused on events for which participants were not responsible. Specifically, we focused on events for which participants blamed another person and thus should feel interpersonal resentment.

Study 6: interpersonal resentment: mental contrasting vs. indulging, dwelling

In Study 6, we investigated mental contrasting effects regarding counterfactual fantasies about events for which participants blamed another person. We hypothesized that mental contrasting (vs. indulging or dwelling) should lead people to experience less resentment against the person who caused the actual event as well as to less regret about allowing the other person cause the event to happen.

Method study 6

Power analysis

Identical to Study 5, we based our power analysis on the mean of the effect sizes observed in Study 1 and Study 2 ($f = 0.44$). Applying this effect size to a power analysis of a one-way ANOVA with three groups indicated that approximately 114 participants would be needed to achieve 99% power ($1 - \beta$) at a 0.05 alpha level ($\alpha = 0.05$). In Study 6, we recruited 116 participants.

Participants

One hundred sixteen participants (53 females) completed the study online via Amazon's Mechanical Turk (MTurk). Participants were 19–70 years old (Mage = 34.80, SDage = 11.44). They were randomly assigned to either a mental contrasting condition ($n = 41$), an indulging condition ($n = 34$), or a dwelling condition ($n = 41$). All participants were told that they would take part in a survey about how people think about the past. The procedure and materials

were approved by the ethical review committee of the University of Hamburg, Germany.

Procedure and materials

Mental exercise

Instructions of the mental exercise were those described in Study 1. However, participants had to name a better alternative to a negative past event caused by a specific person. Participants were further asked to name the person who was responsible for the actual negative event. Participants generated scenarios such as "If this person hadn't wasted my time", or "If she had saved money." Participants in the indulging condition thereafter named and elaborated on two positive aspects they associate with the alternative scenario to have happened (e.g., "We would have gotten closer", "I'd have more money"), whereas participants in the dwelling condition had to name and elaborate two obstacles of their current reality preventing that their counterfactual scenario still comes true (participants named, e.g., "Too late", "It already happened"). Participants in the mental contrasting condition first named and elaborated on a positive aspect of their counterfactual scenario and thereafter named and elaborated on the main obstacle preventing the scenario from still coming true.

Interpersonal resentment

We measured participants' resentment towards the named person using six items of the Gratitude Resentment and Appreciation Test (GRAT-R; Watkins et al. 2003). We selected those six items which, in the original version of the scale, were phrased specific enough so that we could adjust them to assess interpersonal resentment against a specific person, here, the person whom participants had named (e.g., 'I really feel like this person owes me something', 'I don't deserve the bad things that this person has caused'). Participants were asked to indicate their level of agreement to the six statements with regard to the person they named on a scale with anchor points of 1 (*I strongly disagree*), 5 (*I feel neutral about the statement*), and 9 (*I strongly agree*). High scores on the scale indicate high interpersonal resentment.

Regret

We measured participants' regret regarding the negative event using four items of the Decision Regret Scale (Brehaut et al. 2003). Specifically, we selected those four items which we could adjust to assess regret about the person whom participants had named (e.g., 'I regret that I did not stand up against this person', 'It was a bad decision to rely on this person'). Participants were asked to indicate their level of agreement to the statements on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). High scores on the scale reflect high levels of regret.

Results study 6

Thought frequency

Average frequency of thoughts about the positive scenarios ranged from weekly to several times a week, with no significant difference between the mental contrasting ($M = 4.15$, $SD = 2.07$), indulging ($M = 4.24$, $SD = 2.10$), or dwelling conditions ($M = 3.98$, $SD = 1.98$), $F(2, 113) = 0.16$, $p = .85$.

Desirability and expectations

The counterfactual scenarios were rated as desirable, with no significant difference between the mental contrasting ($M = 5.37$, $SD = 1.70$), indulging ($M = 5.76$, $SD = 1.37$), or dwelling conditions ($M = 5.63$, $SD = 1.55$), $F(2, 113) = 0.65$, $p = .52$. The desirability of the scenarios correlated positively with the frequency of thoughts, $r(115) = .32$, $p < .001$, 95% CI [0.14, 0.49], with people who reported a higher frequency of thoughts about their scenario also rating the latter as more desirable. Expectations were moderate, with no significant difference between the mental contrasting ($M = 4.76$, $SD = 2.22$), indulging ($M = 4.06$, $SD = 2.17$), or dwelling conditions ($M = 4.10$, $SD = 2.17$), $F(2, 113) = 1.27$, $p = .29$.

Dependent variable: interpersonal resentment

We submitted the scores of interpersonal resentment to a one-way ANOVA with condition (mental contrasting vs. indulging vs. dwelling) as fixed between-subject factor. There was a significant effect of condition, $F(2, 113) = 5.32$, $p = .006$, $\omega^2 = 0.07$. Participants in the mental contrasting condition reported lower levels of interpersonal resentment ($M = 4.41$, $SD = 1.23$) compared with participants in the indulging condition ($M = 5.14$, $SD = 1.26$), $p = .009$, 95% CI [0.19, 1.28] and compared with participants in the dwelling condition ($M = 5.18$, $SD = 1.07$), $p = .004$, 95% CI [0.25, 1.29]. There was no significant difference in levels of interpersonal resentment between the indulging and dwelling conditions, $p = .89$ (Table 3). The obtained experimental effect of condition on interpersonal resentment remained significant when we entered our control variables (i.e. change scores of pleasant and positive mood, coping self-efficacy, trait regret, trait resentment, and depression) as covariates into the analysis, $F(2, 107) = 5.70$, $p = .004$.

Dependent variable: regret

We submitted the regret scores to a one-way ANOVA with condition as fixed between-subject factor. Three participants did not fill in all regret items, so the regret index was calculated for the remaining 113 participants. There was a significant effect of condition, $F(2, 110) = 3.29$, $p = .04$, $\omega^2 = 0.04$. Participants in the mental contrasting condition reported lower levels of regret ($M = 2.92$, $SD = 1.18$) compared with participants in the indulging condition ($M = 3.60$, $SD = 1.02$), $p = .01$, 95% CI [0.15, 1.21], but not compared with participants in the dwelling condition ($M = 3.32$, $SD = 1.21$), $p = .12$, though it trended in the predicted direction. There was no significant difference in levels of regret between the indulging and dwelling conditions, $p = .31$ (Table 3). The obtained experimental effects of mental contrasting vs. indulging on regret remained significant when we entered our baseline measures (i.e. change scores of pleasant and positive mood, coping self-efficacy, trait regret, trait resentment, and depression) as covariates into the analysis, $F(2, 104) = 5.19$, $p = .007$.

Discussion study 6

For events for which participants blamed another person, mental contrasting of counterfactual fantasies led people to feel less resentment against the person deemed responsible for the event compared with indulging and dwelling. Since feelings of resentment form an obstacle to forgiveness, they can have detrimental effects for interpersonal relationships (Murphy 1982, see also Sherman and McConnell 1995). Mental contrasting might be useful in attenuating those feelings of resentment. Mental contrasting also reduced levels of regret associated with the negative event as compared to indulging, with the difference between mental contrasting and dwelling trending in the predicted direction. Even though participants identified a specific person as the culprit for the negative event, they still tended to blame themselves for letting the person cause the negative event and experienced regret (see Branscombe et al. 2003). As self-blame and regret have been associated with poor well-being (e.g., Davis et al. 1996), mental contrasting might shelter people from these negative consequences. In sum, mental contrasting attenuated both resentment against the person who was identified as the wrongdoer and regret against oneself as the person who allowed for the wrongdoing.

General discussion

Across six studies, we observed that the self-regulation strategy of mental contrasting helped people to let go of positive fantasies about a counterfactual past as measured by attenuated negative emotions resulting from those fantasies. These results appeared for counterfactual alternatives to various life events (controllable and uncontrollable events, past decisions, events caused by another person), for measures of commitment (disappointment) and counterfactual emotions (post-decisional regret, interpersonal resentment and regret) and compared with relevant control conditions, in which participants either indulged in their positive counterfactual alternatives, dwelled on their current reality, reverse contrasted their current reality with their positive counterfactual fantasies, or elaborated on irrelevant content.

We hypothesized that participants who mentally contrast their positive counterfactual fantasies with current reality (vs. indulged, dwelled, or reverse contrasted) would realize that the obstacle of their current reality standing in the way of attaining their wished-for alternative would be overly difficult or impossible to overcome. In turn, they should be free to let go of their counterfactual past. In fact, the obstacles which participants named were often difficult, or even impossible, to overcome (e.g., “It’s too late”, “Can’t turn back time”). We performed additional analyses on the obstacles participants named in the mental contrasting conditions in Studies 1–4 ($N = 300$), in order to more thoroughly investigate the process by which mental contrasting attenuates negative counterfactual emotions. Specifically, upon visual inspection of the data, we aimed to investigate whether a specific characteristic of the obstacles would help people let go of their counterfactual past, independent of the content of the counterfactual scenarios. We performed an exploratory analysis, coding the obstacles according to their concreteness vs. abstractness. We created a Likert scale ranging from 1 (*very concrete*) to 5 (*very abstract*). As an example, a “1” meant that participants named obstacles that specifically related to their scenario (e.g., an argument with a specific friend that hindered them from mending a past relationship), whereas a “5” meant that participants named obstacles that described their current situation in a more abstract way (e.g., their current life situation that hindered them from getting a past job). We found that the abstractness of the obstacles negatively correlated with both disappointment, $r(299) = -.16$, $p = .005$, 95% CI [−0.26, −0.05], and with the global negative affect scale, $r(299) = -.17$, $p = .004$, 95% CI [−0.26, −0.06]. This finding indicates that people who reported more abstract obstacles (i.e., referred to their global current situation as an obstacle), experienced less disappointment and less negative affect. It thus seems that mental contrasting might especially help people let go of their counterfactual past when people name abstract (vs. concrete) obstacles. Presumably, people experience those abstract obstacles as more formidable. Future studies should shed light on this hypothesis.

The relatively low expectations that the positive scenario will still come true across our studies point to the argument that, in real life, people in fact engage in counterfactual fantasies even after events that are immutable, or at least very unlikely to repeat (see also Davis et al. 1995; Markman et al. 2009). Whereas in laboratory studies, counterfactuals are often generated about events that will be repeated within the same experimental setting (e.g., Markman et al. 1993), we induced participants to generate real-life counterfactual pasts that were not repeatable but definitely over (i.e., lost opportunities). Still, expectations that the positive counterfactual scenario would still come true were low to moderate, but not at the lowest level of our expectation scales. Participants might have been reluctant to admit that their desired past is irrecoverably lost. Even though the expectations were not at the lowest level, mental contrasting helped people to attenuate their negative feelings against others and themselves. It is important to note that mental contrasting of future fantasies does not work by changing expectations to attain the desired future (e.g., Oettingen et al. 2001). Data we collected in our lab show that this also pertains to mental contrasting of counterfactual fantasies. That is, mental contrasting does not reduce participants' expectations of the counterfactual past still coming true when those expectations are measured twice, before and after the mental exercise (Krott and Oettingen 2017).

Across the six studies, we observed a high desirability of the counterfactual scenarios as well as a moderate to high thought frequency (i.e., from several times a month to several times a week). These counterfactual fantasies about lost pasts, just like future fantasies about wished-for futures (Oettingen 1999, 2012), may hinder people from engaging in their life in the here and now. By reducing commitment to the counterfactual past as well as attenuating feelings of regret and resentment accompanying this commitment, we speculate people might reconcile with their current reality and get constructively engaged with their current life. Future studies should shed light on this hypothesis.

Related approaches

Goal disengagement

Theories focusing on the function of counterfactuals view counterfactuals in the context of goal pursuit (Epstude and Roese 2007, 2008). Both future goals and upward counterfactuals entail an imagined desired state and for both, negative affect serves as a signal that this desired state is not yet attained. In case of both attainable goals and counterfactuals about repeatable events, negative affect is said to motivate behavior change (Epstude and Roese 2007; Markman and McMullen 2003). However, in the case of unattainable goals, disengagement from those goals might be a more adaptive response. Disengagement benefits well-being and health (e.g., Miller and Wrosch 2007; Wrosch et al. 2007, 2003), and provides the opportunity to reengage in alternative goals, which, again, has been associated with high subjective well-being (Wrosch et al. 2003). Similarly, we argue that in case of lost opportunities, clinging to the counterfactual past entails dysfunctional emotional consequences which should compromise well-being and health (see also Davis et al. 1995; Callander et al. 2007; Markman et al. 2009). Mental contrasting might help people to let go of their counterfactual past and free up resources which then can be used to engage in current reality.

Emotion regulation

Research has suggested that goal commitment influences emotion regulation. Specifically, commitment to a current goal may change the relevance of emotional information in such a way that negative emotional information (e.g., anger) relevant to the current goal is upheld until the goal is either completed or relinquished (review by Koole 2009). A similar argument might apply for commitment to a counterfactual past. Commitment to a desired counterfactual past should change the relevance of emotional information in such a way that negative emotional information regarding the counterfactual is upheld until the counterfactual has either become reality or it has become clear that the counterfactual is not attainable anymore. In case of counterfactuals that are likely to become reality, negative emotions (e.g., disappointment or regret) should signal how a person can still attain the counterfactual past. When opportunities are lost, however, negative counterfactual emotions do not serve a preparative function (see Markman et al. 2009). In those cases, mental contrasting should be a useful tool to help people grasp that the counterfactual past is lost and that they can let go of their idealized past. Letting go in turn, should attenuate negative counterfactual emotions.

Effortful distraction Drawing attention away from negative thoughts or feelings has been proven successful in regulating negative mood. Specifically, distraction with neutral material has been shown to reduce anger (Rusting and Nolen-Hoeksema 1998) and depression (Nolen-Hoeksema and Morrow 1993). Shifting attention to neutral material may occupy working memory and thereby interrupt negative emotion-congruent cognitions (Van Dillen et al. 2008; Van Dillen and Koole 2007). Mental contrasting differs from distraction in various ways: First, whereas distraction draws upon working memory and therefore requires mental effort, mental contrasting involves conscious mental imagery that leads to changes in implicit cognition. Thus, the mechanisms by which mental contrasting works do not require mental effort (Kappes and Oettingen 2014; Kappes

et al. 2012, 2013). Whereas distraction addresses the symptoms of dysfunctional counterfactuals, mental contrasting addresses the causes of dysfunctional counterfactuals: the commitment to the lost counterfactual past.

Thought suppression Mental contrasting clearly differs from the emotion regulation strategy of thought suppression. In fact, instructing people "not to think about" a certain content ironically increases thoughts about this content (post-suppression rebound; Wegner et al. 1987, review by Wenzlaff and Wegner 2000). This effect is especially pronounced for emotional content (e.g., Davies and Clark 1998; Roemer and Borkovec 1994). Thus, suppression should neither be successful in helping people to let go of fantasies about a counterfactual past, nor should it attenuate negative counterfactual emotions.

Cognitive reappraisal In order to come to terms with a counterfactual past, people might cognitively reappraise their fantasy, their past, or their current reality (Gross 1998; review by Koole 2009). People might reappraise situational or contextual aspects (e.g., devalue their fantasies or revalue their current reality). Alternatively, they might distance themselves and adopt a third-person perspective (Ochsner and Gross 2008). Similar to distraction, cognitive reappraisal draws upon working memory resources (Schmeichel et al. 2008), but compared with distraction, it entails more long-term benefits for well-being (Gross and John 2003). In contrast to cognitive reappraisal, mental contrasting does not lead people to reinterpret their past or their reality. Similarly, people who mentally contrast are not instructed to distance themselves from their counterfactual fantasies, but rather to freely imagine them as if they were real. The elaboration of the obstacle of current reality then forms the critical part of the mental contrasting procedure, leading people to realize that the desired alternative past is unlikely to come true. After negative life events, a reinterpretation of the events is often difficult. In those cases, mental contrasting might be a suitable tool to help people to let go of their counterfactual past.

Lost possible selves

The concept of desired counterfactual pasts is similar to the concept of lost possible selves (King and Raspin 2004). Research on lost possible selves has shown that the capacity to elaborate on lost goals is associated with enhanced ego-development, maturity, and with making meaning of life. Whereas the elaboration of lost possible selves entails positive consequences, the salience of lost possible selves is negatively related to well-being (King and Raspin 2004; King and Smith 2004). We go one step further in arguing that *how* people elaborate on their lost possible selves might differentially affect well-being: Whereas vivid elaboration of the lost possible self in the form of positive fantasies may lead to negative counterfactual emotions, elaboration in the form of mental contrasting might shelter people from those negative emotions. Furthermore, King and Hicks (2006) argue that well-being is best predicted by the capacity to let go of possible selves that could have been, and to commit to new goals. Mental contrasting might deem useful in situations in which people get preoccupied with their counterfactual fantasies in a way that those idealized fantasies about lost pasts hinder them from living in the here and now (see also Markman et al. 2009).

Limitations and future directions

In the present studies, we measured short-term effects of mental contrasting on commitment and counterfactual emotions. Assuming that people who mentally contrast understand that their counterfactual past will not come true and, in turn, let go of their counterfactual past, it might be important to investigate whether mental contrasting effects on commitment and counterfactual emotions prove to be stable in the long term.

In the case of future fantasies, people who mentally contrast those fantasies with current reality liberate themselves so that they can engage in alternative endeavors when they have low expectations of attaining the desired future (review by Oettingen 2012). In the case of counterfactual fantasies, people who mentally contrast should similarly liberate themselves to engage in other endeavors (i.e. their current reality) when expectations of attaining the counterfactual past are low. Since mental contrasting reveals that the longed-for counterfactual past is difficult to realize in light of the formidable obstacles (e.g., "The position has been filled", "I have missed the boat") it should help people to actively engage in their current reality.

Conclusion

In response to various life events, people engage in counterfactual fantasies, such as "If only I had married that girl", "If I had not left school", or "If only this accident had not happened". When those whished-for alternatives to lost opportunities are unlikely to ever come true, indulging in idealized fantasies might breed negative emotions hindering people from living in the here and now. The present studies show that mental contrasting helps people to let go of their counterfactual past and attenuates negative emotions resulting from positive counterfactual fantasies. If mental contrasting of counterfactual fantasies, as our results suggest, attenuates negative emotions across various negative life events,

applying mental contrasting in building interventions should help people to come to terms with their counterfactual past.

Acknowledgements We are grateful to the members of the Educational Psychology and Motivation Lab at the University of Hamburg for making valuable comments on a previous version of this article.

Funding This study was funded by German Research Foundation Grant awarded to Gabriele Oettingen (Grant number Oe-237/13-1).

Compliance with ethical standards

Conflict of interest Nora Rebekka Krott and Gabriele Oettingen declares that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee of University of Hamburg (vote: AZ 72-2016) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the studies.

References

Beike, D. R., & Crone, T. S. (2008). When experienced regret refuses to fade: Regrets of action and attempting to forget open life regrets. *Journal of Experimental Social Psychology, 44*, 1545–1550.

Beike, D. R., Markman, K. D., & Karadogan, F. (2009). What we regret most are lost opportunities: A theory of regret intensity. *Personality and Social Psychology Bulletin, 35*, 385–397.

Berger, C. R. (1988). Planning, affect, and social action generation. In L. Donohue, H. E. Sypher, & Higgins, T. E. (Eds.), *Communication, social cognition, and affect* (pp. 93–116). Hillsdale, NY: Erlbaum.

Branscombe, N. R., Owen, S., Garstka, T. A., & Coleman, J. (1996). Rape and accident counterfactuals: Who might have done otherwise and would it have changed the outcome? *Journal of Applied Social Psychology, 26*, 1042–1067.

Branscombe, N. R., Wohl, M. J. A., Owen, S., Allison, J. A., & N'gbala, A. (2003). Counterfactual thinking, blame assignment, and well-being in rape victims. *Basic and Applied Social Psychology, 25*, 265–273.

Brehaut, J. C., O'Connor, A. M., Wood, T. J., Hack, T. F., Siminoff, L., Gordon, E., & Feldman-Stewart, D. (2003). Validation of a decision regret scale. *Medical Decision Making, 23*, 281–292.

Brunstein, J. C., & Gollwitzer, P. M. (1996). Effects of failure on subsequent performance: The importance of self-defining goals. *Journal of Personality and Social Psychology, 70*, 395–407.

Byrne, R. M. J. (2007). Precis of the rational imagination: How people create alternatives to reality. *Behavioral and Brain Sciences, 30*, 439–480.

Callander, G., Brown, G. P., Tata, P., & Regan, L. (2007). Counterfactual thinking and psychological distress following recurrent miscarriage. *Journal of Reproductive and Infant Psychology, 25*, 51–65.

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British Journal of Health Psychology, 11*, 421–437.

Davies, M. I., & Clark, D. M. (1998). Thought suppression produces a rebound effect with analogue post-traumatic intrusions. *Behaviour Research and Therapy, 36*, 571–582.

Davis, C. G., & Lehman, D. R. (1995). Counterfactual thinking and coping with traumatic life events. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 199–231). Mahwah, NJ: Erlbaum.

Davis, C. G., Lehman, D. R., Silver, R. C., Wortman, C. B., & Ellard, J. H. (1996). Self-blame following a traumatic event: The role of perceived avoidability. *Personality and Social Psychology Bulletin, 22*, 557–567.

Davis, C. G., Lehman, D. R., Wortman, C. B., Cohen Silver, R., & Thompson, S. C. (1995). The undoing of traumatic life events. *Personality and Social Psychology Bulletin, 21*, 109–124.

Dyczewski, E. A., & Markman, K. D. (2012). General attainability beliefs moderate the motivational effects of counterfactual thinking. *Journal of Experimental Social Psychology, 48*, 1217–1220.

Eaton, W. W., Smith, C., Ybarra, M., Muntaner, C., & Tien, A. (2004). Center for epidemiologic studies depression scale: Review and revision (CESD and CESD-R). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (3rd edn., Vol. 3, pp. 363–377). Mahwah, NJ: Erlbaum.

Epstude, K., & Jonas, K. J. (2015). Regret and counterfactual thinking in the face of inevitability: The case of HIV-positive men. *Social Psychological and Personality Science, 6*, 157–163.

Epstude, K., & Roese, N. J. (2007). Beyond rationality: Counterfactual thinking and behavior regulation [Peer commentary on journal article "Precis of the rational imagination: How people create alternatives to reality" by R. M. J. Byrne]. *Behavioral and Brain Sciences, 30*, 457–458.

Epstude, K., & Roese, N. J. (2008). The functional theory of counterfactual thinking. *Personality and Social Psychology Review, 12*, 168–192.

Gollwitzer, P. M., & Kirchhof, O. (1998). The willful pursuit of identity. In J. Heckhausen & C. S. Dweck (Eds.), *Motivation and self-regulation across the life span* (pp. 389–423). Cambridge: Cambridge University Press.

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*, 224–237.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362.

Janoff-Bulman, R. (1979). Characterological versus behavioral self-blame: Inquiries into depression and rape. *Journal of Personality and Social Psychology, 37*, 1798–1809.

Jokisaari, M. (2004). Regrets and subjective well-being: A life course approach. *Journal of Adult Development, 11*, 281–288.

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review, 93*, 136–153.

Kahneman, D., & Tversky, A. (1982). The simulation heuristic. In D. Kahneman, P. Slovic & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 201–208). New York: Cambridge University Press.

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., Singmann, H., & Oettingen, G. (2012). Mental contrasting instigates goal pursuit by linking obstacles of reality with 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.

King, L. A., & Hicks, J. A. (2006). Narrating the self in the past and the future: Implications for maturity. *Research in Human Development, 3*, 121–138.

King, L. A., & Raspin, C. (2004). Lost and found possible selves, subjective well-being, and ego development in divorced women. *Journal of Personality, 72*, 603–632.

King, L. A., & Smith, N. G. (2004). Gay and straight possible selves: Goals, identity, subjective well-being, and personality development. *Journal of Personality, 72*, 967–994.

Koole, S. L. (2009). The psychology of emotion regulation: An integrative review. *Cognition and Emotion, 23*, 4–41.

Krott, N. R., & Oettingen, G. (2017). *How to turn counterfactual fantasies into energy and effort: Mental contrasting of the positive past with the impeding reality*. Poster presented at the 2nd Biennial International Convention of Psychological Science, Vienna, Austria.

Landman, J., Vandewater, E. A., Stewart, A. J., & Malley, J. E. (1995). Missed opportunities: Psychological ramifications of counterfactual thought in midlife women. *Journal of Adult Development, 2*, 87–97.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Lecci, L., Okun, M. A., & Karoly, P. (1994). Life regrets and current goals as predictors of psychological adjustment. *Journal of Personality and Social Psychology, 66*, 731–741.

Mandel, D. R. (2003). Counterfactuals, emotions, and context. *Cognition and Emotion, 17*, 139–159.

Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology, 29*, 87–109.

Markman, K. D., Karadogan, F., Lindberg, M. J., & Zell, E. (2009). Counterfactual thinking: Function and dysfunction. In K. D. Markman, W. M. P. Klein & J. A. Suhr (Eds.), *Handbook of imagination and mental simulation* (Vol. 1, pp. 175–193).

Markman, K. D., & McMullen, M. N. (2003). A reflection and evaluation model of comparative thinking. *Personality and Social Psychology Review, 7*, 244–267.

Markman, K. D., & McMullen, M. N. (2005). Reflective and evaluative modes of mental simulation. In D. R. Mandel, D. J. Hilton & P. Catellani (Eds.), *The psychology of counterfactual thinking* (pp. 77–93). London: Routledge.

Markman, K. D., & McMullen, M. N. (2007). Counterfactuals need not be comparative: The case of "as if" [Peer commentary on journal article "Precis of the rational imagination: How people create alternatives to reality" by R. M. J. Byrne]. *Behavioral and Brain Sciences, 30*, 461–462.

Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology, 55*, 102–111.

McCloy, R., & Byrne, R. M. J. (2002). Semifactual "even if" thinking. *Thinking and Reasoning, 8*, 41–67.

McMullen, M. N. (1997). Affective contrast and assimilation in counterfactual thinking. *Journal of Experimental Social Psychology, 33*, 77–100.

McMullen, M. N., & Markman, K. D. (2002). Affective impact of close counterfactuals: Implications of possible futures for possible pasts. *Journal of Experimental Social Psychology, 38*, 64–70.

Miller, G. E., & Wrosch, C. (2007). You've gotta know when to fold'em: Goal disengagement and systemic inflammation in adolescence. *Psychological Science, 18*, 773–777.

Murphy, J. G. (1982). Forgiveness and resentment. *Midwest Studies in Philosophy, 1*, 503–516.

Nasco, S. A., & Marsh, K. L. (1999). Gaining control through counterfactual thinking. *Personality and Social Psychology Bulletin, 25*, 557–569.

Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition and Emotion, 7*, 561–570.

Ochsner, K. N., & Gross, J. J. (2008). Cognitive emotion regulation: Insights from social cognitive and affective neuroscience. *Current Directions in Psychological Science, 17*, 153–158.

Oettingen, G. (1999). Free fantasies about the future and the emergence of developmental goals. In J. Brandtstädter & R. M. Lerner (Eds.), *Action and self-development: Theory and research through the life span* (pp. 315–342). Thousand Oaks, CA: SAGE.

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., & 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., 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., 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.

Roemer, L., & Borkovec, T. D. (1994). Effects of suppressing thoughts about emotional material. *Journal of Abnormal Psychology, 103*, 467–474.

Roese, N. J. (1994). The functional basis of counterfactual thinking. *Journal of Personality and Social Psychology, 66*, 805–818.

Roese, N. J. (1997). Counterfactual thinking. *Psychological Bulletin, 121*, 133–148.

Roese, N. J., & Hur, T. (1997). Affective determinants of counterfactual thinking. *Social Cognition, 15*, 274–290.

Roese, N. J., & Morrison, M. (2009). The psychology of counterfactual thinking. *Historical Social Research, 2*, 16–26.

Roese, N. J., & Summerville, A. (2005). What we regret most…and why. *Personality and Social Psychology Bulletin, 31*, 1273–1285.

Roese, N. J., Summerville, A., & Fessel, F. (2007). Regret and behavior: Comment on Zeelenberg and Pieters. *Journal of Consumer Psychology, 17*, 25.28.

Rusting, C. L., & Nolen-Hoeksema, S. (1998). Regulation responses to anger: Effects of rumination and distraction on angry mood. *Journal of Personality and Social Psychology, 74*, 790–803.

Schmeichel, B. J., Volokhov, R. N., & Demaree, H. A. (2008). Working memory capacity and the self-regulation of emotional expression and experience. *Journal of Personality and Social Psychology, 95*, 1526–1540.

Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*, 1178–1197.

Sevincer, A. T., Busatta, P. D., & Oettingen, G. (2014). Mental contrasting and transfer of energization. *Personality and Social Psychology Bulletin, 40*, 139–152.

Sherman, S. J., & McConnell, A. R. (1995). Dysfunctional implications of counterfactual thinking: When alternatives to reality fail us. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 199–231). Mahwah, NJ: Erlbaum.

Smallman, R., & Roese, N. J. (2009). Counterfactual thinking facilitates behavioral intentions. *Journal of Experimental Social Psychology, 45*, 845–852.

Summerville, A., & Roese, N. J. (2008). Dare to compare: Fact-based versus simulation-based comparison in daily life. *Journal of Experimental Social Psychology, 44*, 664–671.

Van Dillen, L. F., Heslenfeld, D., & Koole, S. L. (2008). Tuning down the emotional brain: An fMRI study of the effects of cognitive load non the processing of affective images. *NeuroImage, 45*, 1212–1219.

Van Dillen, L. F., & Koole, S. L. (2007). Clearing the mind: A working memory model of distraction from negative emotion. *Emotion, 7*, 715–723.

Watkins, P. C., Woodward, K., Stone, T., & Kolts, R. L. (2003). Gratitude and happiness: Development of a measure of gratitude, and relationship with subjective well-being. *Social Behavior & Personality: An International Journal, 31*, 431–452.

Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*, 5–13.

Weisz, J. R., McCabe, M. A., & Dennig, M. D. (1994). Primary and secondary control among children undergoing medical procedures: Adjustment as a function of coping style. *Journal of Consulting and Clinical Psychology, 62*, 324–332.

Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. In S. T. Fiske (Ed.), *Annual review of psychology* (Vol. 51, pp. 59–91). Palo Alto, CA: Annual Reviews.

Wicklund, R. A., & Gollwitzer, P. M. (1982). *Symbolic self-completion*. Hillsdale, NJ: Erlbaum.

Wrosch, C., Miller, G. E., Scheier, M. F., & Brun de Pontet, S. (2007). Giving up on unattainable goals: Benefits for health? *Personality and Social Psychology Bulletin, 33*, 251–265.

Wrosch, C., Scheier, M. F., Carver, C. S., & Schulz, R. (2003). The importance of goal disengagement in adaptive self-regulation: When giving up is beneficial. *Self and Identity, 2*, 1–20.

Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., & Carver, C. S. (2003). Adaptive self-regulation of unattainable goals: Goal disengagement, goal reengagement, and subjective well-being. *Personality and Social Psychology Bulletin, 29*, 1494–1508.

Zeelenberg, M., & Pieters, R. (2007). A theory of regret regulation 1.0. *Journal of Consumer Psychology, 17*, 3–18.

Zeelenberg, M., van Dijk, W. W., & Manstead, A. S. R. (1998). The experience of regret and disappointment. *Cognition and Emotion, 12*, 221–230.