

Mental Contrasting with Implementation Intentions Increases Goal-Attainment in Individuals with Mild to Moderate Depression

Anja Fritzsche¹ · Björn Schlier¹ · Gabriele Oettingen^{1,2} · Tania M. Lincoln¹

Published online: 13 January 2016

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Abstract Depression is associated with difficulties initiating and performing goal-directed behavior. In healthy participants, the self-regulation strategy of mental contrasting with implementation intentions (MCII) has been demonstrated to facilitate goal-directed behavior. We investigated whether people with depression benefit from using MCII in attaining their goals and whether MCII attenuates symptoms of depression. Forty-seven participants with depression were randomly assigned to a MCII-condition or a waiting-control-condition. Participants in the MCII-condition performed MCII on one depression-relevant goal (e.g. social/physical activities). Goal-attainment, changes in depression, and in self-efficacy expectations after 3 weeks were measured. Significantly more participants in the MCII-condition (78.6 %) than in the waiting-control-condition (31.6 %) attained their goal. We found no significant between-group effects on depression or self-efficacy, but there was a medium pre-to-post reduction in depression in the MCII-condition and only a small effect in the control-condition. MCII is a useful strategy to facilitate goal-pursuit in depression and may be a useful adjunct to interventions aimed at behavioral activation.

Keywords Depression · Self-regulation · Activity-related goals · Mental contrasting with implementation intentions (MCII)

Anja Fritzsche and Björn Schlier have contributed equally to this article.

✉ Björn Schlier
Bjoern.schlier@uni-hamburg.de

¹ Institute of Psychology, University of Hamburg, Von-Melle-Park 5, 20146 Hamburg, Germany

² Psychology Department, New York University, 6 Washington Place, New York, NY 10003, USA

In depression, the loss of interest in everyday pursuits is a prime symptom and the majority of patients report a “paralysis of will” (Beck and Alford 2008). Depression is associated with decreased activity, particularly with decreased physical activity (Camacho et al. 1991; Paffenbarger et al. 1994; Penedo and Dahn 2005), less social activity (Bell-Dolan et al. 1993; Youngren and Lewinsohn 1980), and less pleasant activities (Lewinsohn and Graf 1973; Lewinsohn and Libet 1972). A decrease in activity leads to a loss of positive reinforcement, which in turn amplifies lack of motivation and intensifies depression (Hopko et al. 2003; Lewinsohn et al. 1980). Furthermore, decreased activity is associated with reduced self-efficacy expectations (Maciejewski et al. 2000; Schwarzer et al. 1997).

Consequently, several therapies for depression aim to increase activity: behavioral activation treatment for depression (BATD, Hopko et al. 2001; Lejuez et al. 2011; Martell et al. 2010) focuses on increasing the number of pleasant or value-driven activities of patients and their positive interactions with the environment. Cognitive behavioral therapy (CBT) interlinks activity monitoring with interventions targeting dysfunctional beliefs (Beck et al. 1979). In both therapies, therapists convey why becoming active is important for recovery. In BATD, therapists attempt to increase patients’ goal-directed behavior by highlighting the idiosyncratic rewards of goal-attainment. In CBT, therapists typically instruct their patients to compile and put into action everyday schedules with subjectively pleasant activities (Beck et al. 1979; Cuijpers et al. 2007). Motivational strategies that go beyond strengthening incentive value and expectations of success, however, are less focused on in these therapies. Thus, motivational strategies that target specific components of goal pursuit such as forming goal commitment,

goal striving, or forming if-then plans (Oettingen and Gollwitzer 2010), may be a useful adjunct to further increase the efficacy of BATD and CBT.

Self-Regulation by Mental Contrasting with Implementation Intentions (MCII)

One such self-regulation strategy fostering goal pursuit (i.e., goal commitment and goal striving) is mental contrasting with implementation intentions (MCII; Oettingen and Gollwitzer 2010; Oettingen 2012). MCII combines two self-regulation strategies: mental contrasting and forming implementation intentions.

Mental Contrasting

Mental contrasting (Oettingen 2000, 2012) is a problem solving tool that fosters the pursuit and attainment of feasible goals. During mental contrasting, a person first mentally elaborates a desired future (e.g., get together with friends) and then identifies and imagines obstacles of reality that hold them back from realizing the envisioned future (e.g., feeling exhausted). Thus, mental contrasting of feasible wishes strengthens the associative links between the desired future and the obstacles of present reality (Kappes and Oettingen 2014) as well as between the obstacles and the behavior to overcome the obstacles (e.g., to call my friend). Indeed, mental contrasting ties instrumental behavior to obstacles even when these behaviors are not explicitly elaborated (Kappes et al. 2012). Mental contrasting also changes the meaning of reality, in that the reality now becomes interpreted as an obstacle that needs to be overcome (Kappes et al. 2013). In sum, mental contrasting is a conscious strategy that fosters goal pursuit by activating cognitive and motivational mechanisms outside of people's awareness.

Many experimental studies find that mental contrasting leads to the vigorous pursuit of desired and feasible goals facilitating their attainment (e.g., performance in math, solving interpersonal conflicts). These effects have been found whether the goals were for the immediate or the long-term future, and whether goal pursuit was measured via cognitive, emotional or behavioral indicators (summaries by Oettingen 2012, 2014). In the health behavior domain, for example, mental contrasting improved physical activity among overweight, middle-aged men (Sheeran et al. 2013) and it improved healthy eating and physical exercise in college students (Johannessen et al. 2012). However, sometimes people face particularly hard obstacles, and then they may benefit from additional strategies.

Implementation Intentions

A strategy that has been found to help overcome challenging obstacles is forming implementation intentions or if-then plans, i.e. "If I face situation X, then I will perform goal-directed response Y!" (Gollwitzer, 2014). For example, a person who pursues the goal of getting physically active and his obstacle is feeling exhausted can form the implementation intention: "If I feel exhausted, then I will get up and take a walk!"

Implementation intentions or if-then plans facilitate goal attainment based on processes regarding the anticipated situation (specified in the if-part) and by producing strong associative links between the situation (if-part) and the relevant goal-directed behavior (then-part) (Gollwitzer 2014). This enables the goal-directed response to be initiated swiftly, efficiently (no mental effort needed) and without further conscious intent (e.g., Bayer et al. 2009). A meta-analysis of almost hundred studies evinced a medium effect ($d = 0.61$; Gollwitzer and Sheeran 2006) of forming implementation intentions on heightened rate of goal attainment across life domains, ages, and types of obstacles (e.g., getting started, staying on track, or resource depletion). For example, implementation intentions increased walking behavior in women of low physical activity (Arbour and Martin Ginis 2009) and increased the likelihood of attending a first psychotherapy appointment in psychotherapy patients who reported shame about help-seeking (Sheeran et al. 2007).

Mental Contrasting with Implementation Intentions (MCII)

Mental contrasting combined with implementation intentions (MCII) has been observed to benefit goal pursuit more than the two components by themselves (e.g., Adriaanse et al. 2010; Kirk et al. 2013). In the health domain, MCII has been shown to increase physical activity in a healthy community sample over 4 months (Stadler et al. 2009), in chronic back pain patients over the period of 3 months (Christiansen et al. 2010), and in stroke patients over the period of 1 year (Marquardt et al. in preparation).

As MCII fosters physical activity and active goal pursuit in non-depressed individuals and because it achieves its behavior change by nonconscious mechanisms, we hypothesized that MCII also fosters goal attainment in individuals with depression. MCII leading to heightened goal pursuit by nonconscious mechanisms should particularly benefit people with depression, as such nonconscious processes should unfold their beneficial effects on goal pursuit despite depression symptoms such as conscious ruminations (Nolen-Hoeksema 2000) or irrational beliefs

(Beck and Alford 2008). Additionally, we examined whether experiencing goal-attainment by means of working with the MCII-strategy affects depression severity and self-efficacy expectations.

Method

Participants

Two hundred and fifty prospective participants answered to an advertisement in a local newspaper that called for people with depression to take part in an experimental intervention to ameliorate their symptoms. Participants received no monetary compensation for their participation. They were screened with a modified version of the German Version of the Structural Clinical Interview for DSM-IV (SKID-I, Wittchen et al. 1997) via telephone. A trained student-interviewer rated potential participants on six scales: Sadness, loss of interest, sleep disturbance or loss of appetite, loss of energy, negative thoughts and loss of social contacts. Participants were included if they met the criteria of acute mild to moderate depression. Exclusion criteria were (1) an acute severe major depressive episode, (2) acute suicidal thoughts, (3) mental comorbidities (axis-I, DSM-IV), and (4) current psychotherapeutic treatment. These criteria resulted in a final sample of 47 participants. Sample characteristics are summarized in Table 1.

Outcome-Measures

Goal-attainment after 3 weeks was assessed by one self-report question (“Did you attain the goal you named?” yes/no).

Depression severity was assessed with the German version of the Beck Depression Inventory-II (BDI-II; Hautzinger et al. 2009). The BDI-II measures depression severity by self-report on 21 items with four levels of symptom severity, respectively. The BDI-II exhibits good psychometric values in clinical and non-clinical groups (Cronbach’s α : $0.84 \leq \alpha \leq 0.89$; 3 weeks $r_{tt} = 0.78$, Hautzinger et al. 2009).

Self-efficacy expectations were measured with the German version of the Generalized Self-Efficacy Scale (GSE, Schwarzer and Jerusalem 1995; Schwarzer et al. 1997). The questionnaire includes ten items (e.g., “I can always manage to solve difficult problems if I try hard enough.”), which are rated on four-point Likert-scales ranging from 1 (not at all true) to 4 (exactly true). Reliability and validity of the GSE are considered to be satisfactory (Cronbach’s α : $0.76 \leq \alpha \leq 0.90$; 1 year $r_{tt} = 0.55 \leq r \leq 0.75$; Schwarzer and Jerusalem 1995).

Design and Procedure

Participants were randomly assigned to either a MCII-condition ($n = 28$) or a waiting-control-condition ($n = 19$). We used a 2 (condition: MCII intervention, waiting-control) \times 2 (time: baseline, post assessment) repeated measure design.

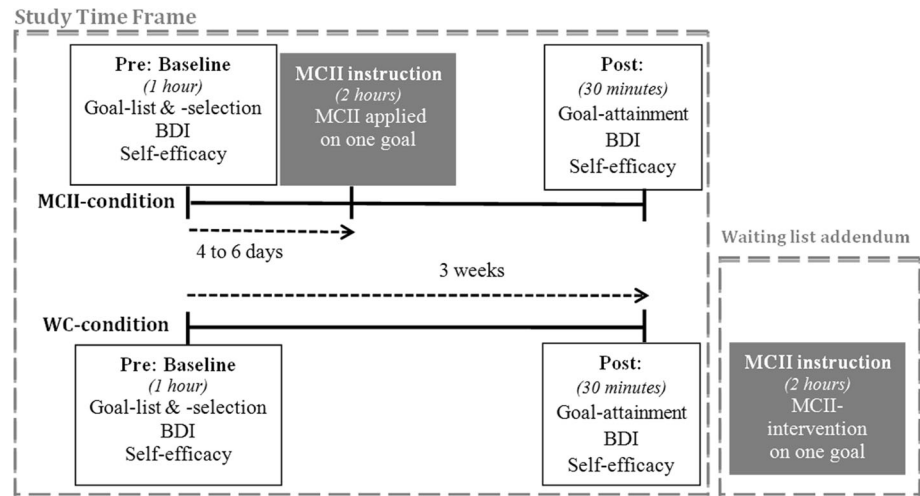
All sessions took place in small groups (2–5 participants; altogether 7 MCII-groups and 6 waiting-control-groups). In the MCII-condition, each participant was instructed to apply MCII to their self-chosen goal. Two undergraduate psychology-students were trained by the first author (AF) to provide the intervention. The details of the procedure, which consisted of a baseline session, an instruction session (for the MCII-groups only), and a post-instruction

Table 1 Sample characteristics by condition

	MCII-condition ($n = 28$)			Waiting-control-condition ($n = 19$)			Test for between group differences
	%	<i>M</i>	<i>SD</i>	%	<i>M</i>	<i>SD</i>	
Percentage of							
Women	57.1			63.2			$X^2(1) = 0.01, p = 0.923$
Currently treated with medication	67.9			52.6			$X^2(1) = 1.11, p = 0.292$
College entrance certificate or more	64.3			63.2			$X^2(1) = 0.01, p = 0.937$
Age (range 31–67 years)		47.7	10.7		50.5	7.7	$t(45) = -0.659, p = 0.513$
Baseline depression (BDI-II)		26.6	9.4		23.4	8.4	$t(45) = 1.28, p = 0.207$
Baseline self-efficacy (GSE)		23.2	5.57		25.1	3.73	$t(45) = -1.28, p = 0.207$
Perceived likelihood to attain chosen goal		6.39	1.94		6.05	1.68	$t(45) = 0.62, p = 0.536$
Importance of chosen goal		9.21	1.17		9.11	0.74	$t(45) = 0.36, p = 0.720$

BDI-II = Beck Depression Inventory (sum-score with possible scores: 0–63); GSE = General Self-Efficacy Scale (sum-score with possible scores: 10–40)

Fig. 1 Procedure for mental contrasting with implementation intentions (MCII) and waiting-control-condition (WC). BDI = Beck Depression Inventory-II



session after 3 weeks, is depicted in Fig. 1. Participants were given 3 weeks after the pre-treatment session to attain the chosen goal in order to ensure that they had sufficient time to actively pursue their goal. Finally, participants in the waiting-control-condition received the MCII instruction session after the 3 week period of the study.

Pre-treatment Session

In the baseline session, all participants provided informed consent and then completed the BDI-II and GSE. Next, they were asked to name one individual recovery-oriented goal in each of five depression-related domains: (1) pleasant activities (“I would like to become more active and would like to engage in the following activities...”), (2) social contact (“I would like to establish more contact with my friends and family by taking the following actions: ...”), (3) physical activity (“I would like to become more physically active and will take the following actions: ...”), (4) coping with depression symptoms (“Instead of negative thinking and ruminating I would like to develop the following positive thoughts about my perception of myself, the world and the future:...”) and (5) a freely chosen depression-related activity goal. For each goal, the incentive value (“How important is it to you that you will attain the goal?”) and expectations of goal-attainment (“How likely do you think it is that you will attain the goal?”) were measured on a Likert-scale ranging from 0 (not at all) to 10 (very much). Participants were then asked to choose one single goal from their five generated goals, which they wanted to attain in the following 3 weeks. This goal had to meet two criteria: It had to be very important and at least moderately achievable (at least a rating of five on the expectations scale). In the control-condition, participants were then instructed to pursue and attain their goal within the next 3 weeks as a way to reduce depression severity.

MCII Session

In the instruction session (2 h duration), participants worked on their goal individually using MCII as described by Oettingen (2012, 2014). First, participants engaged in mental contrasting. They were asked to “please state four positive aspects which you associate with attaining your goal (e.g., feeling proud, enjoying life more, getting to know new people, etc.)”, and they were asked to “please state four negative aspects of reality which stand in your way to reaching your goal (e.g., being stressed, having no time, lack of knowledge)”. Participants ranked their positive future and negative reality aspects in order of importance. Participants now transferred the most important positive keyword pertaining to successfully reaching their goal to the top of a sheet of paper. Then they received these instructions: “Think about this aspect and depict the respective events or experiences in your thoughts as intensively as possible! Write down the respective thoughts and images associated with the aspect. Don’t hesitate to give your imagination free rein. Take as much time as you need to describe what comes to your mind when thinking about this aspect.”

After participants finished elaborating about the keyword on the upper half of the page, they transferred the most important keyword pertaining to the negative reality to the middle of the page and received the same instructions to mentally elaborate as described above. After completing the first sheet, participants moved on to a second sheet with the same two sets of instructions and elaborated and wrote about the second most important positive future and the second most important negative reality aspect.

Thereafter, participants formed implementation intentions. Participants were instructed to name the most important obstacle and to specify when and where they anticipated it occurring. Next, they were told to think of an

effective behavior to overcome this obstacle and to create an if-then plan based on the blueprint “if the obstacle X occurs, then I will perform behavior Y”. Each participant wrote down their if-then plan on a small card as a memory aid.

Post-treatment/Waiting Session

All participants completed the BDI-II and GSE again, freely recalled their chosen goal, and reported whether they had attained their goal.

Analyses

We used logistic regression to test for differences in goal-attainment between conditions and repeated-measure ANOVA by time (within-subject) and condition (between-subject) to test whether depression severity and self-efficacy expectations changed more in the MCII than in the control-condition.

Results

Group Characteristics at Baseline

Participants in the two conditions did not differ in demographic variables, severity of depression and self-efficacy expectancies at baseline. They also did not differ in incentive value and expectations of goal-attainment (see Table 1). Most participants chose the physical activity (41 %) or the freely-chosen depression-related goal (33 %) rather than the pleasant activity (12 %), social contacts (6 %), or the coping with depression goal (8 %). There were no differences between groups in the type of goals that were chosen [$\chi^2(4) = 4.02, p = 0.404$].

Treatment Effects

Participants in the MCII-condition reached their goals significantly more often (78.6 %) than participants in the waiting-control-condition (31.6 %) [$OR\ 7.94\ (95\ \%CI\ 2.23\text{--}32.3),\ Wald\ z = 3.07, p = 0.002$]. This difference remained significant ($OR > 7, all\ ps < 0.01$), irrespective of whether demographic variables (gender, age, level of education), clinical variables (baseline values of BDI-II, GSE), self-reported importance, or likelihood of attaining one’s goal were controlled for in the multiple logistic regression models.

Effect sizes of pre-to-post changes of depression and self-efficacy in the MCII and control-group are depicted in Fig. 2. A repeated measure 2 (self-regulatory strategy condition: MCII intervention, waiting-control) \times 2 (time point: baseline, post assessment) ANOVA on depression yielded a main effect of time, $F(1,45) = 13.85, p = 0.001,$

$\eta^2_{partial} = 0.24,$ but no significant condition \times time effect, $F(1,45) = 2.55, p = 0.12, \eta^2_{partial} = 0.054,$ or condition effect, $F(1,45) = 0.34, p = 0.56, \eta^2_{partial} = 0.007.$ For self-efficacy expectations no effect was significant [time: $F(1,45) = 0.64, p = 0.43, \eta^2_{partial} = 0.014;$ condition \times time: $F(1,45) = 0.64, p = 0.43, \eta^2_{partial} = 0.014;$ condition: $F(1,45) = 0.89, p = 0.35, \eta^2_{partial} = 0.019$].

Discussion

The present study examined whether individuals with mild to moderate symptoms of depression benefit from applying the MCII strategy to reach their activity-related goal.

Compared to goal-setting without motivational strategies, MCII doubled the rate of goal-attainment after 3 weeks. This is in line with findings from trials on healthy participants (Oettingen and Gollwitzer 2010; Oettingen 2012). Previous studies show that people with depression tend to solely focus on possible obstacles to goal-attainment (Johnson et al. 2010). In combination with positive thoughts about the desired future, however, considering obstacles to goal attainment seem to help rather than prevent goal attainment. We speculate that the predetermined structure of MCII helps people with depression to maintain a realistic perspective when pursuing goals, while at the same time guiding them to break away from dwelling on their current unhappy situation.

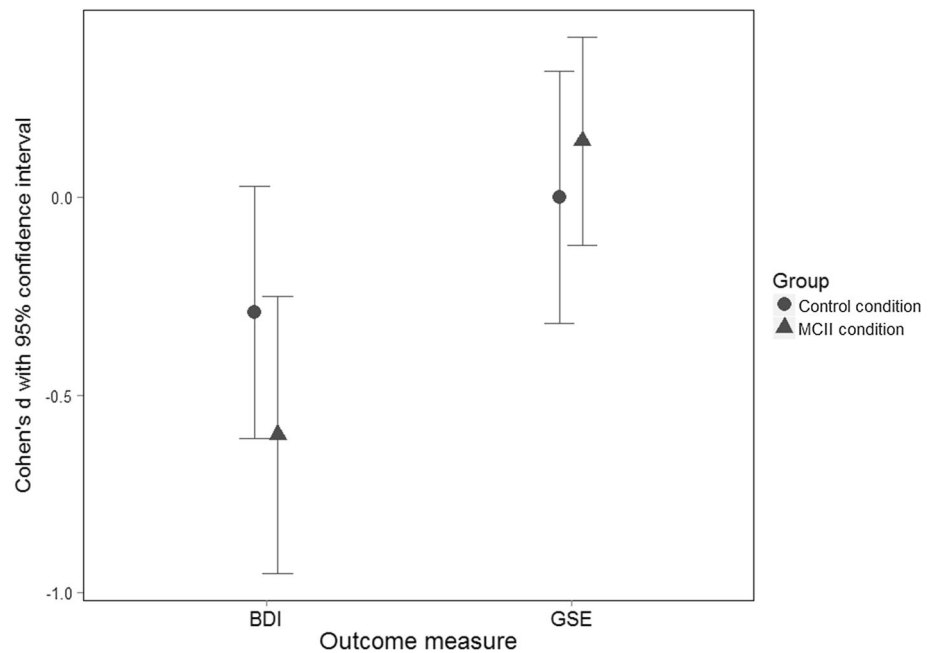
We found depression to decrease over the study period in both conditions, with a medium pre-to-post effect in the MCII-condition and a small effect in the control-condition. However, the difference between the effects was not significant. As the association between heightened activity and reduced symptoms of depression is well established (e.g. Segrin 2000; Teychenne et al. 2008), we speculate that the study lacked the power to show differences between the MCII- and waiting-control-condition during the relatively short time frame of 3 weeks.

Finally, MCII did not substantially affect self-efficacy expectations, which is in line with previous studies finding no short-term effects of mental contrasting or implementation intentions on self-efficacy expectations (Oettingen and Gollwitzer 2010; Oettingen 2012). One specific goal may not suffice to affect global self-efficacy expectations, and 3 weeks might have been a too short period of time to alter them.

Practical Implications

Due to its focus on nonconscious processes and individualized application (Oettingen 2014), MCII might amplify

Fig. 2 Effect sizes of pre-to-post change in depression severity (BDI) and general self-efficacy expectations (GSE) by group



the effects of existing interventions that emphasize the necessity to increase activity rates, such as CBT (Beck et al. 1979) and BATD (Hopko et al. 2001; Lejuez et al. 2011; Martell et al. 2010). Most importantly, the effects of MCII emerged after one group session (2 h) suggesting that implementing MCII is cost and time effective.

Limitations

Some limitations need noting. First, our sample was small. This may have occluded significant effects of the intervention and prevented a precise point estimation of the intervention effects. Findings need to be replicated with a sufficiently large sample. Second, this trial had no active control condition, so we were unable to discriminate the specific effect of MCII from possible demand effects or effects due to spending differential time with the target goal. Third, we measured goal-attainment by self-report, specifically by a binary distinction of attainment. However, for some goals (e.g., thinking positively about oneself, others, and the future) a quantification of varying levels of success might have been more adequate. Furthermore, behavioral outcome measures are warranted such as applied in previous MCII studies (e.g., Christiansen et al. 2010), in order to rule out the alternative explanation of a biased reporting style of goal-attainment in the MCII-condition.

Conclusions

In sum, MCII constitutes a promising approach to attain activity-related goals and possibly reduce symptoms of depression. Future studies need to further test the effects of MCII on people with depression using larger samples, repeated MCII-interventions on multiple goals and follow-up assessments. Moreover, the efficacy of MCII needs to be compared to other goal-attainment strategies (e.g. mental simulation, Taylor and Pham 1996; or problem-solving training, D’Zurilla and Goldfried 1971) and it should be tested if MCII can be implemented to increase the treatment-success of evidence-based therapies such as CBT or BATD.

Acknowledgments We thank all participants who took part in our study.

Compliance with Ethical Standards

Conflict of Interest Anja Fritzsche, Björn Schlier, Gabriele Oettingen, and Tania Lincoln declare 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 national research committee (approved by the ethical review committee of the *Psychotherapeutenkammer Hamburg*.) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual subjects participating in the study.

Animal Rights No animal studies were carried out by the authors for this article.

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